CONTENTS

Impact of Globalization on Labour Productivity in the Malaysian Construction Sector

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Abstract: The sector has contributed significantly to the economic growth and employment in Malaysia. In the present era of globalization and liberalization, the growth of the construction sector should be more robust in line with the flexibility in the policies regarding the possession of properties in Malaysia and the increasing global demand. This article aims to analyze the impact of globalization on labor productivity in the construction sector using 1990-2009 panel data collected from the Department of Statistics Malaysia. The construction sector is divided into four sub-sectors, namely, residential building, non-residential building, installation of building and civil engineering. Indicators of globalization such as foreign direct investment (FDI), economic openness and foreign labor are used as part of the independent variable in the analysis. Estimation results show FDI and economic openness are statistically significant in influencing the labor productivity in the construction sector, but the ratio of foreign labor to total employment in the construction sector is not significant.
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1. Introduction

The contribution of the construction sector to the Malaysian economy is considerably significant and important. This industry has changed in the last decade and has moved in line with globalization. Rapid economic development has boosted demand for property in Malaysia and the relaxation of the government to own property among foreigners has provided opportunities for the construction sector continues to grow. The importance of the construction industry can be seen clearly through its involvement in various types of construction such as residential buildings, shops, office buildings, schools, institutions and others.

Generally, the construction sector encounters a moderate growth rate, which is between 3-4 per cent for the period 1990-2000. But it is higher compared to some other subsectors such as electricity, gas and water in the services sector, which the growing rate is of 2-3 per cent for the same period. Construction output growth rate reached the highest in 1995, at 4.4 per cent compared with other years. The economic vibrancy drives this sector to grow before the economic downturn in 1997/1998.

Contribution of the construction sector on employment is also important to be discussed because it is related to the problem of unemployment. Number of employment in the construction is the fourth highest after the country's main sectors such as services, manufacturing and agriculture. In the Sixth Malaysia Plan (6-MP) the number of construction sector employment is the highest, although the number of other sectors' employment except for the manufacturing sector experienced a decline. This situation is consistent with the intense growth of construction output that was achieved at the end of the 6-MP, which was in 1995. However, number of employment in the construction sector experienced the lowest volatility in the Ninth Malaysia Plan (9-MP). Malaysia's economic downturn during the financial crisis that took place in 2007/2008 contributed to less employment generation in the construction sector. During the crisis the real estate sector was also affected which further dampen the activity of this sector through the reduction in output and employment.

Although, theoretically, the inflow of FDI will have positive spillover effects on productivity, empirical researches show mixed results. The magnitude of spill over varies across the level of technology, capital intensity of industries, skilled labor, the domestic firm size, and the pattern of each country's FDI. Barrios (2002) and Ramirez (2006) reviewed the effect of FDI on productivity by using the endogenous growth model showing the existence of positive relationship between FDI in labor performance. In the context of the construction sector FDI spill over obtained through the supply of inputs and machinery for the use of this sector. The presence of foreign investors involved in the manufacturing project provides access for the construction sector to get input at a lower price compared with the imported inputs.

Economic theory suggests that increasing access to economic openness can affect the productivity of the firm through the channels that can

be summarized broadly such as the increment in competitive pressures, changes in market share, increase access to technology, as well as spillover effects. Whether the effects are positive or negative, are very much dependent on market structure and types of instruments used in trade. For the construction sector, economic openness facilitates the inflow of foreign inputs, including skills. There are construction projects that depend on foreign expertise, such as mega projects KLCC and KL tower. Parts of the intermediate inputs in construction sector are not available locally and had to be imported directly from abroad. Furthermore, foreign workers, especially the semiskilled and unskilled workers are very much needed by the construction sector in Malaysia. In fact, the majority of lower level employees in this sector are dominated by the foreign workers due to the unwillingness of the local workers to work in the construction sector that is considered dangerous and less attractive. Therefore, based on these arguments, all the variables of globalization, FDI, economic openness and foreign labor will have positive impact on labor productivity in the construction sector.

2. Literature Review

The idea that FDI increase the productivity of local companies proposed by Caves (1974) when he tested the benefits of FDI in the manufacturing sector of the two leading host country during that time which is Canada and Australia. He pointed out that FDI increase productivity through the competition between the enterprises. FDI also pushed technology to the next level and innovation for local firms. His research in Canada found that the correlation between the shares of subsidiary companies and local manufacturing productivity level is not clear due to the limited data problem, while in Australia, this correlation is clear and positive.

However, Globerman (1979) showed that labor productivity in the firm has a positive relationship with the presence of FDI in Canada. He showed that FDI leads to some spillover such as industry capital intensity, economies of scale, and quality of labor. Liu et al. (2000) supported this idea in their review of the 48 industries in the United Kingdom. They prove that the greater the technological capabilities of British companies, the greater the benefits they receive from FDI. Liu et al. (2000) in another study also showed that FDI has a positive effect on labor productivity in the electronics industry in China, and they concluded that the most important determinant is the quality of labor, followed by the domestic firm size and level of foreign investment.

According to Vahter (2004), positive spill over from FDI depends on the level of economic development of host country. Based on his research, there is no positive spill over of FDI in Estonia. He found that export-oriented foreign companies have lower labor productivity than domestic market-oriented companies and owned by local and foreign investors. On the contrary, in Slovenia, the export-oriented companies of local and foreign combination are not correlated with labor productivity. The results showed that different types of FDI would have different effects on the productivity of the host country. As for Kien (2008) and Vahter (2004), the most important advantages of FDI for host countries are acquiring modern technology, management skills and marketing skills in addition to capital.

Although many previous studies concluded that the effect of FDI on the productivity of the firm is clear and positive, but there are also studies showing that this effect is obscure and even negative. According to Aiken and Harrison (1999), the productivity of local firms decreased when the foreign investment increased in Venezuela. They proved that the positive relationship between venture companies and productivity of domestic companies is sound for only small local firms with less than 50 employees. Thus, they concluded that this relationship is relatively small and ambiguous. This conclusion is different from the Caves (1974) from Liu et al. (2000).

Konings (2000) found that there were negative effects of FDI on the productivity of local firms in market, including Bulgaria, Romania and Poland. He argued that the effects will depend on the conditions in the receiving country and proved that they have a positive correlation with the level of development and different types of FDI (whether joint ventures or projects wholly owned by foreigners), and also the level of labor skills. This decision was supported by Thiam (2006) who found the positive relationship between FDI and productivity in eight East Asian economies - China, Hong Kong Special Administered Region of China, Indonesia, Malaysia, Republic of Korea, Singapore, Taiwan, China and Thailand.

Pradhan (2004) then concluded that the efforts made to promote R & D and some centralization of the size of local firms in the industry may be better than a passive liberalize FDI policy from the standpoint of increasing the efficiency of local enterprises productivity. In his study, the hypothesis spill over of FDI was tested in the pharmaceutical industry in India by using the unbalanced panel data for the sample firms in the period 1989-1990 to 2000-2001. The study found that the presence of foreign companies might be

unimportant for the local firm productivity growth unless it is supported by R & D. Contradict with the opinion of Bohra (2011) in the analysis of India's economic sectors who found that FDI has helped to increase output, productivity and employment in some sectors, especially in the services sector. He stated that FDI is a tool for economic growth by strengthening capital, domestic productivity, and employment. FDI plays an important role in the grading of the technology, skills and management capabilities in various sectors of the economy. The analysis proved that FDI is an important stimulus for economic growth of India in which the growth of FDI increased the output and productivity in the services sector.

Wong (2006) concluded that trade liberalization of Ecuador improved manufacturing productivity. In his study, the focus was on changes in productivity and restructuring of resources from less to a more productive unit. It applied the robust estimation procedure on the micro-level data to identify the impact of policies on productivity and economic problems that can interfere with productivity levels throughout the study. The study took particular interest in seeing how the competing imports and exports respond to trade openness. Wong (2006) stated that there are positive and significant evidence of trade openness on the productivity of the manufacturing industry for export-oriented industry after the trade executed.

Nevertheless, for Casabucerta et al. (2004), they stated that there was no evidence of dynamic changes in productivity across different industry concentration levels. Analysis has been done on the effects of trade liberalization on labor and gross capital flows as well as productivity in the country's production sector of Uruguay. Openness to the international environment had increased the employability rates and reduced the capital. Although industry concentration reduced the level of job elimination, it has no impact on employability or capital dynamics. Changes in the use of labor and capital followed by the increasing productivity occurred only for certain sectors with the reduction of the tariff is large and no union. Therefore, trade openness actually can give different effects on different segments of the industry (Abizadeh et al., 2007).

Rapid increment in the demands of foreign employees reflects the excess demand and rapid economic growth, as well as their cheaper cost. Zaleha et al (2011) found that foreign workers have a positive impact on labor productivity of the manufacturing sector. In the long run, immigrants do not affect the local unemployment rate, but increase productivity and average income of the destination country (Abdul Kadir et al., 2005). These findings are consistent with the study in the United States (Peri, 2010) and supported by Nikolaj et al. (2011), and Ottaviano and Peri (2008). Nikolaj et al. (2011) studied of how foreign expertise influenced the productivity and wages of local firms in Denmark and found that the firms employing foreign expertise were capable of raising productivity and higher wages and a tendency to continue to employ foreign expertise.

3. Methodologies and Model Specifications

The labor productivity model used in the analysis of this article is based on the Cobb-Douglas production function.

$$Y = AK^{\beta 1} L^{\beta 2} \qquad (1)$$

where Y is total output, A is the parameter, K is capital stock and L is the total force. Marginal product is derived from equation (1) as follows:

$$\frac{\partial Y}{\partial L} = \frac{\partial}{\partial L}\left[Y(K,L)\right] = \beta_2 AK^{\beta 1} L^{\beta 2-1}$$

$$= \frac{1}{L}\beta_2 AK^{\beta 1} L^{\beta 2} \qquad (2)$$

Or,

$$\frac{\partial Y}{\partial L} = \beta_2 \frac{Y}{L} \qquad (3)$$

From equation (3), the average output of labor (Y / L) is equal to labor productivity. This function can be derived as follows:

$$\beta_2 \frac{Y}{L} = \frac{\partial Y}{\partial L}$$

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$$\frac{Y}{L} = \frac{\partial Y}{\partial L}\frac{1}{\beta_2} \qquad (4)$$

Substitute $\frac{\partial Y}{\partial L}$ from equation (2), then equation (4) become

$$\frac{Y}{L} = \beta_2 \frac{AK^{\beta 1} L^{\beta 2}}{L} \frac{1}{\beta_2}$$
$$= AK^{\beta 1} L^{\beta 2-1}$$
$$\frac{Y}{L} = A\left(\frac{K}{L}\right)^{\beta 1} L^{\beta 1+\beta 2-1} \quad (5)$$

Equation (5) can be written in the form of natural logarithms as:

$$\ln\left(\frac{Y}{L}\right) = \ln A + \beta_1 \ln\left(\frac{K}{L}\right) + (\beta_1 + \beta_2 - 1)\ln L \quad (6)$$

To see the impact of globalization on labor productivity, the globalization variables are added in equation (6) and estimated equation will be as follows:

$$\ln\left(\frac{Y}{L}\right)_{it} = \beta_0 + \beta_1 \ln\left(\frac{K}{L}\right)_{it} + \beta_2 (LPROF/L)_{it}$$
$$+ \beta_3 (LTEK/L)_{it} + \beta_4 (FL/L)_{it} +$$
$$\beta_5 \ln FDI_t + \beta_6 OPN_t + \varepsilon_{it} \quad (7)$$

where,

$\ln A = \beta_0$

lnY / L = the natural logarithm of labor productivity; real output in the construction sector is divided with the total force for the sector.

lnk / L = the natural logarithm of capital Intensity; true value of the assets owned by the construction sector is divided with the total labor sector.

lnFDI = natural logarithm of Malaysia's real foreign direct investment value

OPN = level of Malaysia's economic openness; the export and import value is divided with the real GDP.

LPROF / L = ratio of local professionals employment to total employment in the construction sector.

LTEK / L = ratio of local employment for the technical category to total employment in the construction sector.

FL / L = ratio of foreign employment to total employment in the construction sector.

i = the various selected building categories, which consists of four construction sub-sectors.

t = time.

B0-β6 = estimator coefficient

ε = error term

3.1 Source of Data

Data Y, L, Prof. TEK and FL were obtained from the Construction Industry Survey Report, Department of Statistics Malaysia, FDI data were obtained from the Ministry of International Trade and Industry (MITI), while data on exports, imports and GDP were obtained from the Economic Report, Ministry of Finance, Malaysia. Year 2000 was the basis for real data.

3.2 Static Data Panel

Typically, a panel data analysis model used is the constant coefficient estimator, estimators of fixed effects and random effects. Constant coefficient estimator model is also known as pooled regression model and this model is using fixed effect, which is known as the Least Square Dummy Variable Model (LSDV), which refers to the model with a constant slope but different intercept based on cross-sectional units. Random effects estimator model refers to the fixed random regression with cross-sectional units error that do not relate to the variables error in the model. It was found that the value of cross section of sub-sectors was four sub-sectors and it was smaller than the regression number, 6 variables, resulting in failure of random effects estimator that could not be performed due to the insufficient requirements. The regression number must be smaller than the number of cross-section.

3.3 Dynamic Data Panel

The analysis of panel data based on constant estimators, fixed effects or random effects could not coordinate heterogeneous dynamics in long-term relationship equilibrium (Pesaran et al., 1995). Long-term parameters are more consistent if estimated using autoregressive distributed lag approach (ARDL) (Pesaran & Shin, 1999). In addition, as found by Pesaran et al. (1999) this approach has been consistent in producing long-term coefficient estimators whether the basic repressor I (1) or I (0). Therefore, the estimated Mean group (MG) and the Pooled Mean Group (PMG) is conducted in this study for a dynamic panel data analysis.

3.3.1 Pooled Mean Group (PMG)

PMG is based on autoregressive distributed lagged (ARDL) model that has the advantage to determine the dynamics long-term and short-term relationships. Panel analysis on the unrestricted error correction ARDL (p, q) (Pesaran et al., 1999):

$$\Delta y_{it} = \phi_i y_{i,t-1} + \beta_i' x_{i,t-1} +$$
$$\sum_{j=1}^{p-1} \lambda_{ij} \Delta y_{i,t-j} + \sum_{j=0}^{q-1} \gamma_{ij}' \Delta x_{i,t-j} + \mu_i + u_{it}$$

$$\Delta y_{it} = \phi_i y_{i,t-1} + \beta_i' x_{i,t-1} +$$
$$\sum_{j=1}^{p-1} \lambda_{ij} \Delta y_{i,t-j} + \sum_{j=0}^{q-1} \gamma_{ij}' \Delta x_{i,t-j} + \mu_i + u_{it} \quad (8)$$
$$i = 1,2,...; t = 1,2,...T$$

with v is the dependent variable, x_{it} is the kx 1 vector of (weakly exogenous) regressor for group i, μ_i represents the fixed effects, ϕ_i are scalar coefficients on lagged dependent variable, β_i is a 1xk coefficient vector on describing variables, λ_{ij} is scalar coefficients of the lagged dependent variable in first differentiation, and γ_{ij} is the kx 1 vector of coefficients on variables that explain the first differentiation and lagged values.

Disruption in ARDL model is considered having no relation on all i and t, with mean zero and variance > 0.ϕ_i < 0 for all i and therefore long-term relationship exists between y_{it} dan x_{it} as defined by:

$$\Delta y_{it} = \phi_i \eta_{i,t-1} + \sum_{j=1}^{p-1} \lambda_{ij} \Delta y_{i,t-j} + \sum_{j=0}^{q-1} \gamma_{ij}' \Delta x_{i,t-j} + \mu_i + u_{it} \quad (9)$$

$$y_{it} = \theta_i' x_{it} + \eta_{it}$$

$$i = 1,2,...;t = 1,2,...T$$

With kx1vector as the long-term coefficient and η_{it} as unchanged with the possibility of non-zero mean (including the fixed effects).
Equation (8) can be rewritten as

$$\Delta y_{it} = \phi_i \eta_{i,t-1} + \sum_{j=1}^{p-1} \lambda_{ij} \Delta y_{i,t-j} + \sum_{j=0}^{q-1} \gamma_{ij}' \Delta x_{i,t-j} + \mu_i + u_{it} \quad (10)$$

Where $\eta_{i,t-1}$ is the correction of errors in (2), ϕ_i is the error correction coefficient that measures the speed of adjustment towards the long-term equilibrium.

Under this general framework, Pesaran et al. (1999) suggested PMG estimator. PMG allows intercept, short-term coefficients and the free difference error in all groups, but the long-term coefficients are constrained as well, $\theta_i = \theta$ for all i. The specific group of short-term and long-term coefficients was calculated by the pooled maximum likelihood estimator.

The rationale behind the expecting of long-term equilibrium relationships between the same variables across the groups was due to budget constraints or Solvency, arbitrage conditions, and common technology that affect all groups in the same way.

3.3.2 Mean Group (MG)

According to Pesaran and Smith (1995), less restricted procedure allows the diversity of all parameters (impose any restrictions on country borders). It consists of estimating separate regression estimates for each country to collect country specific coefficients.

Both MG and PMG estimation requires choosing an appropriate lag length for equation of individual countries; Schwarz Baysian Criterion (SBC) / Akaike Information Criterion (AIC). MG measurement provides a consistent long-term mean estimation even if this can be inefficient if the homogeneity sloping. In long-term sloping homogeneity, pooled estimators are consistent and efficient. MG estimation is the weighted mean of the regression of N individuals' coefficients. MG option is through all the panels in the sample to estimate the parameters of the equation (8). MG estimation is presented as a two-equation model of normal co-integration vectors and dynamic short-term coefficients.

3.3.3 Hausman test

The long-term homogeniti parameter hypothesis cannot be regarded as major, but it requires an empirical test in all specifications. The mean coefficient heterogeneity effects can be determined by the Hausman test (Hausman, 1978). Hausman test is used to distinguish between MG and PMG.

3.4 Analysis of Estimation Results

Table 1 shows the descriptive statistics of variables. In general, the labor productivity of this sector is RM3, 219. The average value of the capital-labor ratio is RM16, 616.2. This sector has a small ratio of professional workers and local technical workers, which is 4.9 per cent and 5.7 percent respectively. On the average, the ratio of foreign workers involved in the construction sector is about 10 per cent and the average FDI is RM 181 million for the whole economy of Malaysia. The degree of Malaysia's economic openness in the period 1990-2009 is 1727.

Model estimation is done through two methods of panel data analysis; using constant coefficient estimator model and fixed coefficient estimator model. The random effect estimator model was not used because the data does not meet the criteria of this model which requires a larger number of cross-sectional than regression number. The findings from both estimations were tested to select the best model using Wald F-test specifications. Hypothesis for this test is:
H_0 = constant coefficient estimator model
H_1 = fixed effects estimator model

Table 1: Descriptive Statistics of the Variable

Variable	Mean	Median	Maximum	Minimum	Standard Deviation	N
Y/L	3.219804	3.327600	3.562006	2.559085	0.277341	80
K/L	16.6162	15.6478	38.9682	0.0058	7.5735	80
LPROF/L	0.0489	0.0426	0.1995	0.0049	0.0278	80
LTEK/L	0.0572	0.0532	0.2192	2658.000	0.0315	80
FL/L	0.1034	0.1059	0.1135	0.07885	0.733761	80
FDI	181.3043	16347.70	48098.80	6287.000	10579.27	80
OPN	1.727	1.715	2.75	1.33	0.3001	80

Note:
Y / L = Real labour productivity in construction sector (RM '000)
K / L = ratio of real capital-labor in construction sector (RM'000)
PROF / L = ratio of the professional labor force to total labor force in construction sector
TEK / L = ratio of the technical labor force to total labor force in construction sector
FL / L = ratio of foreign labor force to total labor force in construction sector
FDI = foreign direct investment in Malaysia (RM million)
OPN = degree of economic openness of Malaysian (ratio)

It was found that by using F-Wald test, the results indicated that the fixed effects estimator model is better than the constant coefficient estimator model when H_0 is rejected. The R^2 value of fixed effects estimator is also higher than the R^2 value of constant coefficient estimator which is (0.7678> 0.7129). Thus, the fixed effects estimator model is better as an estimator model (see Table 2).

The results of estimation showed the capital-labor ratios are found to be significant in influencing the labor productivity in the construction sector. A 1 per cent increase in this ratio will increase labor productivity by 0.217 per cent. Capital-labor ratio may reflect the level of capital intensity and technology level of construction sector. These results suggested that more advanced technologies must be used in the construction and thus reduced the dependency on foreign workers. Similarly, the results show that the ratio of professional and technical labor to the total labor is not statistically significant in influencing labor productivity of the construction sector. This reflects that labor productivity in the construction sector does not depend on the proportion of skills, but more important is the capital intensity.

Estimation results further indicate that the globalization variables such as FDI and economic openness are significant in influencing the labor productivity in the construction sector. A 1% increase in FDI will increase labor productivity by 0.198 per cent, while an increase of one point in the economic openness will increase labor productivity by 0.6 per cent. FDI inflows into the economy helped the construction sector in getting inputs or materials, which are formerly imported. Similarly, the economic openness will facilitate the process of acquiring inputs that have still to be imported. It will further affect the efficiency of the production as well as enhancing the labor productivity.

Table 2: Results of estimation of panel data using pooled model and the fixed model

Variables	Pooled Model	Fixed Effect Model.
INTERCEPT	1.324001	1.209055
	(2.859052)***	(2.752268)**
lnK/L	0.034211	0.217161
	(0.632353)	(3.098030) ***
LPROF/L	111.1289	56.70393
	(2.238434)**	(1.183305)
LTEK/L	-89.72439	-30.31473
	(-2.181453)**	(-0.741287)
FL/L	-1.045849	-0.459362
	(-2.726353)***	(-1.109350)
lnFDI	0.256140	0.198548
	(5.180699)***	(4.064380)***
OPN	0.868520	0.618828
	(8.428508)***	(5.486481) ***
R-SQUARED	0.712891	0.767810
F-STATISTIC	30.20974	25.71970
	0.0000	0.0000

Wald F-test rejected H_0
Note: * / ** / *** significant at the significance level of 10%, 5%, 1%

3.5 The Results of Dynamic Data panel technique (PMG and MG)

Results of the PMG and MG methods are shown in Table 3. PMG estimation provides further details in panel data regression with long-term relationship objects separated from short-term relationship. PMG estimation shows a positive relationship between changes in OPN and FDI in the long term and short-term labor productivity growth, while the K / L and LPROF / L is positive and significant for the long term only. LTEK / L have a negative relationship in the long-term level of labor productivity. The positive relationship between economic openness with the labor productivity is consistent with the study of Wong (2006) who found that there is a positive and significant evidence of trade openness on the productivity of the

manufacturing industry for export-oriented industry after the trade activities were carried out.

The result of PMG estimation implies that FDI and economic openness is important to be increased in order to increase labor productivity in the construction sector. The effect occurs rapidly and persistently. The benefits of labor productivity from the capital-labor ratio and professionals labors only happen in the long run showing the effects of both variables on labor productivity takes a long time to occur. This may be due to the time consumption of new technology adaptation by professional labor. On the contrary, in the case of foreign workers, they contribute to increased labor productivity only in the short run, but when they stay longer in the construction sector, they no longer provide a significant contribution, which may be due to low skill levels. The findings of MG showed that most of the coefficients were not significant except for FDI variables, which showed a significant and positively-related relationship besides good labor productivity in the long run. Meanwhile, economic openness variable, technical labor and foreign labor were all significant and positive for short term only.

Hausman test showed that the results of PMG were more suitable compared to MG. The Hausman statistic calculated was 1.00 with χ^2 = 0.00. PMG estimator is a more efficient measurement under the null hypothesis, making PMG a better and more reliable method. In general, the result obtained from the ARDL specification is more consistent in describing the relationship between the dependent variable and the independent variable for the long-term compared to the traditional static data panel method. The results produced are consistent with the economic theories and fulfil the statistics requirements.

Table 3: The estimation of PMG and MG model

Pooled Mean Group and *Mean Group* Estimator
(dependent variable: Y/L_{it})

	PMG Estimator			MG Estimator				
	Coefficient	se	p- value	Coefficient	se	p- value	$\chi^2(2)$	P
Prod $_{it}$								
ΔlnK/L $_{it}$	0.2839	0.1506	0.059*	2.9821	4.1107	0.468		
Long-term	0.1125	0.1063	0.290	0.1151	0.0115	0.317		
Short-term								
ΔLPROF/L $_{it}$	6.1718	0.5443	0.000***	7.1644	9.3003	0.441		
Long-term	-0.0040	0.0430	0.925	0.0421	0.1077	0.696		
Short-term								
ΔLTEK/L $_{it}$	-4.4642	0.3316	0.000***	1.0847	3.3777	0.748		
Long-term	0.0041	0.0065	0.532	-0.0185	0.0094	0.050**		
Short-term								
ΔFL/L $_{it}$	0.0475	0.0580	0.413	1.0790	3.1872	0.735		
Long-term	0.1044	0.0429	0.015**	0.1463	0.0384	0.000***		
Short-term								
ΔlnFDI $_{it}$	-1.0453	0.0127	0.000***	-1.0443	0.0122	0.000***		
Long-term	0.0141	0.0079	0.074*	0.0227	0.0207	0.287		
Short-term								
ΔOPN $_{it}$	2.1284	0.1768	0.000***	-1.9061	2.5682	0.458		
Long-term	0.5516	0.3910	0.000***	0.2910	0.1687	0.084*		
Short-term								
Hausman Test							0.00	1.0000

Note: * / ** / *** significant at the significance level of 10%, 5%, 1%

4. Conclusion

The findings of this study showed that the FDI variables and economic openness are two important elements in escalating labour productivity in construction sector in Malaysia. This positive and strong relationship did not happened only in the short term but also in the long term. Although FDI in Malaysia is not directly occurred in the construction sector, but the presence of foreign investors who keeps opening up new projects facilitated the construction sector to get inputs at a cheaper price compared to the imported ones. However, not all inputs can be produced or available in the country. There are some which still needed to be imported

especially the high quality inputs for the construction of high-impact projects. Therefore, economic openness is helping a lot for this sector to get imported inputs.

When dynamic analysis is done, there are significant relationships between other variables such as professional and technical labour ratio and the ratio of foreign labour to total labour in the construction sector. But their relationship is different in the short and long term. For instance, the ratio of professional labour is positive and significant in the long term, while the technical labour ratio is negative and significant in the long term.

Based on these findings, several basic implications can be presented. The importance of FDI and economic openness in labour productivity is very clear, and this requires government commitment in the promotion of both activities. Encouragement for FDI should be supported with incentives and information that is able to attract foreign investors to invest in the country. Similarly, the capital intensity should be intensified to reduce our dependency on foreign labour especially in the long run. This means that in the long run, these two types of investments, namely human capital investment to improve the professional labours and physical capital investment to increase the capital intensity needs to be done. There are some physical capital investments made by foreign investors through FDI. In conclusion, the government should be sensitive towards important contributors to labour productivity in the construction sector to ensure the continuance of the development of this sector is maintained.

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Teacher's Concept and its relation to Temperament and Coping Strategies among Mentally Retarded Children

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Abstract: This study aimed to assess the teachers' concept and its relation to temperament and coping strategies among mentally retarded children. A descriptive correlational design was utilized in this study. convenient sample consisted of 130 mentally retarded children, their parents and 31 teachers was selected; who were presented at the schools of El-Tarbia- El- Fekria in Hahia and Zagazig city. Tools for data collection were; Socio-demographic data sheet, the teachers' Temperament Questionnaire (TTQ), the teachers' concept of the mental retardation, and The Coping Ability in Children. The results reveald that Temperament increased with increasing coping abilities, Children coping score had positive significant correlations with children IQ, No statistically significant associations between teachers' concept and coping and temperament. It was concluded that when IQ of those children was high, the coping abilities increased. The study recommended that the teachers should continuously observe and evaluate the children to recognize the temperament and coping abilities in the class. Building positive relationship and deal with children by love, sympathy, empathy and caring.

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Key words:. Mental retardation, temperament, coping, teachers concept.

1. Introduction

The mental retardation is one of the most frequently encountered and distressing disabilities among children in developing countries and it constitutes a major problem in Egypt because it affects the quality of life of persons and the welfare of their families; found that the prevalence of mental retardation was 3.9% among an Egyptian population. (Ghising et al., (2007).

Mental retardation (MR.) is a frequently occurring disorder with an estimated incidence of 1-3% in developed countries (Rodriguez-Revenga Bodi, et al., 2006). Additionally WHO, (2011). stated that The overall prevalence of mental retardation is believed to be between 1% and 3%, with the rate for moderate, severe and profound retardation being 0.3%.

Mental retardation is a state of developmental deficit, beginning in childhood, that results in significant limitation of intellect or cognition and poor adaptation to the demands of everyday life, intellectual disability is not a disease in and of itself, but is the developmental consequence of some pathogenic process.(Sebastian, , 2008).

Temperament is the manner in which a child interacts with the environment. The way a child experience a particular event will be influenced by his or her temperament, and the child's temperament will influence the responses of others, include the parents, to the child. Early on, infants demonstrate differences in their behavior in response to stimuli this responses are an integral part of the infant's developing personality and individuality. Although a child's temperament is intrinsic, it does change over time. Knowing a child's temperament can help parents understand and accept the characteristic of the child without feeling responsible for having caused them. (Kyle, 2008).

Coping is a complex human behavior that is influenced by a number of different factors such as temperament, environment, situational factors, learned behaviors, and level of perceived control to name a few. There is overlap in many of the two factor models as to what constitutes effective and ineffective coping, which has led to confusion. (Angela Gionet, 2007).

Teachers' concept toward students with disabilities may affect how they relate to these children and their expectations concerning the performance of children with handicaps in regular education setting. Thus, if the students with disabilities are to be successfully integrated into regular education programs, the attitudes of general educators toward them should be a major concern of preservice and inservice education programs. Cheen, (2007).

A student's temperament plays a significant role in the emergence of a teacher's perception of the student's learning style (i.e., the manner, willingness, and energy with which the student approaches a learning task), educational competence (EC) (i.e., cognitive ability, motivation, and maturity) and teach ability (i.e., the teacher's view of the attributes of an ideal model student). Hence, temperament contributes to students' academic achievement and a teacher's subjective ratings of school grades.(Hintsanen, et al., 2011).

Nurse practionaries who provide primary care for children with special health care needs know that well-child care is as important as illness mangement. Discussing illness is freqantly expected and highly priortieszed at well-child care vists, partequlary for parents of children with special health care needs. (Cleave et al., 2007).

Aim of the study

The aim of this study was to assess the teachers' concept and its relation to temperament and coping strategies among mentally retarded children.

Research questions:

1. Is their any relationship between the teacher's concept and temperament of children with mental retardation?
2. Is their any relationship between the teacher's concept and coping Strategies of children with mental retardation?
3. Is their any relationship between coping strategies and temperament among mentally retarded children?

2. Subjects and methods

Research Design:

A descriptive correlational design was utilized in this study.

Setting:

This study was conducted at schools of El-Tarbia- El- Fekria in Hahia and Zagazig city.

Sample:

A convenient sample consisted of 130 mentally retarded children, their parents and 31 teachers was selected. Subjects were eligible for recruitment in the study sample if they met the following inclusion criteria: For children; Age from 6 to 12 years, Both genderand All children diagnosed by mental retardation. For teachers; Both genders, Dealing and Presenting all time with child.

Tools of data collection:

Socio-demographic data sheet,This tool developed by the researcher to assess the personal characteristic of the children, their parents and the teachers. Socio-demographic for child such as Age, gender, school grade, Residence, birth order, Education level of parents, job of parents, social class, family size and income.

Socio-demographic for teachers it includes Age, gender, Number of years teaching experience, education level, Residence, marital status and social class.

- The Coping Ability in Children, This tool was originally constructed by Zeitlin, (1985) , completed by the classroom teacher to assess adaptive and maladaptive coping habits, skills, and behaviors that a child uses to manage the world, it consists of 48 questions and is divided into two categories: Coping with self and Coping with Environment. Each of these two categories Contain 24 items and assessment is measured on 5-point Likert Scale, The five categories for scoring system are: (1) Not Effective, (2) Minimally Effective, (3)Effective in some situations but not in others, (4) More often than not effective or appropriate, and (5) Effective most of the time.
- The Teacher Temperament Questionnaire, This tool was designed by Keogh. (1982) and this tool was constructed to assessing teacher's perceptions of children's temperament , It consists of 23 items and assessment is measured on 6-point Likert Scale, The six categories for scoring system are: (1) hardly ever, (2) Once in a while, (3) Sometimes, (4) Often, (5) Very often, and (6) Almost Always.
- The teacher's concept of the mental retardation, This questionnaire was designed by the researcher to evaluate the teacher's concept about mental retardation, it consists of 20 items self reported tool scored on a 5-point likert scale with possible responses " strongly agree", " agree"," undecided ", " disagree" and " strongly disagree", it include four subscales which are human being (5 items), understanding (5 items), giving chance (5 items) and future as a citizen (5 items).

Pilot study:

A pilot study was carried out on13 students from different school stages, completed by the classroom teacher, constituting about 10 percent of the total study sample. It was done to test the feasibility and clarity of the tools, and also helped to know the time needed for filling the tools. not needed any modifications and they had been included later in the study.

Field work:

Once permission was granted to proceed with the study, the researcher visited the study sittings and met with the parents having mentally retarded children and the teachers who dealing with their children who fulfilled the inclusion criteria. The purpose of the study was explained to the parents and the teachers, and he/she was invited to participate in the study. Upon agreement to participate, the researcher started the interview with the parent and teachers individually using the data collection tools. The questionnaire was read, explained, and choices were recorded by the teachers.

From the pilot study results, it was found that the average time to fill in all tools, about 30-45minutes. The time in which the data were collected was at the beginning of first semester in the study year 2011/2012.

Ethical Considerations:

The aim of the study was explained to every parent and teacher before participation, which was totally voluntry and nonparticipation or withdrawal rights at any time without giving any reason, the

teachers and parents were assured about confidentiality of the information gathered and its use only for their benefits and for the purpose of the study.

3. Results:

Data from Table (1a),(1b):Shows that the children age ranged from 6-12 years old, More than one-third of them were males (68.5%). living in rural areas (75.4%). And the majority of them were Moslem (95.4%). and mostly of third or higher birth rank (37.7%) and recurrent percentage in classes fourth, fifth and sixth (18.5%).

Data from Table(1c) and (1d):Reveals that the number of brothers was mostly one (49.2%), while about one- third of them having one sister (43.8%) and recurrent percentage for children having two or higher sisters, More than half of the children comesto school with mothers (73.5%), compared to (23.1%) for fathers. the source of information (73.8%)were taken from mothers while (25.4%)were taken from fathers. and regarding the family income about half (46.2%) was not sufficient, nearly similar percentage (40.8%) was of sufficient but the family income ranged from 300-900 with mean 600.0±424.2 .

Data from Table (2c):Shows that more than half of the family members ranged from 3 to 5 ware (62.3%) of the families, but family members ranged from 3-10 with mean 5.3±1.4 and the majority of parents' marital status were married (92.3%)and about two- thirds of social class were low (62.5%).

Figures (1) and (2): Illustrates that most of mentally retarded children (96.2%) were fair temperament. Only 1.5% was poor temperament. And majority of mentally retarded children (70.8%) were fair coping but only (10.8%) were good coping.

Figure (3): Shows that the majority of mentally retarded children (56%) had their IQ ranged from 50-55%. Only 19% had their IQ over 60%.

Tables (3) and (4): Indicates that the age of the studied teachers ranged from 32-52 years with mean 42.19±5.7. And more than half of the teachers were females (58.1%). and the majority of them had bacalorous (87.1%). and all of them were Moslems (100.0%) and the majority of them were urban (71.0%) also in all of them were married (100.0%). and less than half of teachers income were not Sufficient (41.9%) while about one- third of them (32.3%) were sufficient. And more than half of teacher's social class (58.1%) was low.

Figures (4) and (5): Displays the experience years of the teachers. It reveals that less than half of them (45%) were over 20 years. only 16% had experience years ranged from 5-10 years. and more than half of the teachers' training sessions (54.8%) were from 11-20 sessions but training sessions ranged from 3-30 sessions with mean 12.5±6.03.

Data from Tables (6) and (7): Shows that positive statistically significant correlation between temperament among mentally retarded children and their coping (r=0.418). While no statistically significant associations between teacher's concept and coping and temperament among mentally retarded children.

Data from Table (8): Illustrates that positive statistically significant correlation between children's IQ and coping of them (r=0.235). But there is no statistically significant correlation between the other demographic characterstics children and coping abilities, temperament among mentally retarded children.

Data from Table (10): Demonstrates positive statistically significant correlation between teacher's ages and human being (r=0.407). While the educational level of teachers had highly negative statistically significant correlations with human being (r=-0.563).

Data from Table (11) and (13): Displays there is only positive statistically significant correlation between chance and understanding(r=0.415). While all componant of the teacher's concept had positive statistically significant correlation with human being (r=0.582), understanding (r=0.765), and chance (r=0.672).but there are no statistically significant correlation between total teacher's concept and future as a citizen.

Table 1a. Socio- demographic and personal characteristics of children in the study sample (n=130).

Age			Sex			Residence		
Items	**No**	**%**	**Items**	**No**	**%**	**Items**	**No**	**%**
6-8	**32**	**24.6**	**Male**	**89**	**68.5**	**Rural**	**98**	**75.4**
9-10	**33**	**25.4**	**female**	**41**	**31.5**	**Urban**	**32**	**24.6**
More than 10	**65**	**50.0**						
Range	**6-12**							
Mean± SD	**9.9±1.9**							

Table 1b.Continue Socio- demographic and personal characteristics of children in the study sample (n=130).

Birth order			Religion			Classes		
Items	No	%	Items	No	%	Items	No	%
1	**44**	**33.8**	**Moslem**	**124**	**95.4**	**1**	**23**	**17.7**
2	**37**	**28.5**	**Christian**	**6**	**4.6**	**2**	**19**	**14.6**
3+	**49**	**37.7**				**3**	**16**	**12.3**
						4	**24**	**18.5**
						5	**24**	**18.5**
						6	**24**	**18.5**

Table 1c.Continue Socio- demographic and personal characteristics of children in the study sample (n=130).

No of Brothers			No of sisters			Who accompany the child		
Items	No	%	Items	No	%	Items	No	%
0	**5**	**3.8**	**0**	**16**	**12.3**	**father**	**30**	**23.1**
1	**64**	**49.2**	**1**	**57**	**43.8**	**Mother**	**95**	**73.0**
2+	**61**	**46.9**	**2+**	**57**	**43.8**	**Sister or brother**	**3**	**2.3**
						Alone	**1**	**0.8**
						grandfather	**1**	**0.8**

Table 1d.Continue Socio- demographic and personal characteristics of children in the study sample (n=130).

Source of information			Income		
Items	No	%	Items	No	%
father	**33**	**25.4**	**Sufficient and cost effective**	**17**	**13.0**
Mother	**96**	**73.8**	**Sufficient**	**53**	**40.8**
grandfather	**1**	**0.8**	**Not sufficient**	**60**	**46.2**
			Range	**300-900**	
			Mean±SD	**600.0±424.2**	

Table 2c. Continue Personal characteristics of parents in the study.

Item	No	%
Family members:		
3+	81	62.3
6+	45	34.6
9+	4	3
Range	3-10	
Mean±SD	5.3±1.4	
Marital status:		
Married	120	92.3
Divorced	3	2.3
widow	7	5.4
Social class:		
high	18	13.8
Middle	32	24.6
low	80	62.5

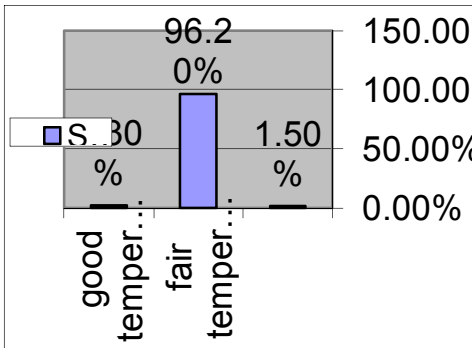

Figure 1.Temperament among mentally retarded children.

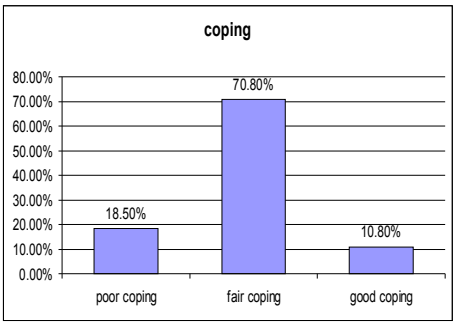

Figure 2. Coping among mentally retarded children.

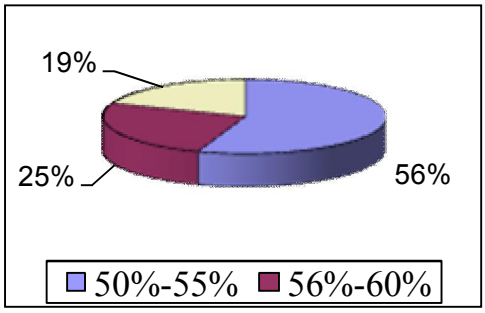

Figure 3. IQ score of mentally retarded children.

Table 3. Socio- demographic and personal characteristics of the teachers in the study sample. (n=31).

Item	No	%
Age (years):		
30-40	13	41.9
41-50	17	54.8
50+	1	3.2
Range	32-52	
Mean+SD	42.19+5.7	
Sex:		
Male	13	41.9
Female	18	58.1
Education levels:		
diploom	3	9.7
Bacalorous	27	87.1
doctorate	1	3.2

Table 4. Personal characteristics of the teachers in the study sample (n=31).

Item	No	%
Religion:		
Moslem	31	100.0
Residence:		
Rural	9	29.0
urban	22	71.0
Marital status:		
married	31	100.0
Income:		
Sufficient and saving money	8	25.8
Sufficient	10	32.3
Not Sufficient	13	41.9
Social class:		
High	2	6.5
Middle	11	35.5
Low	18	58.1

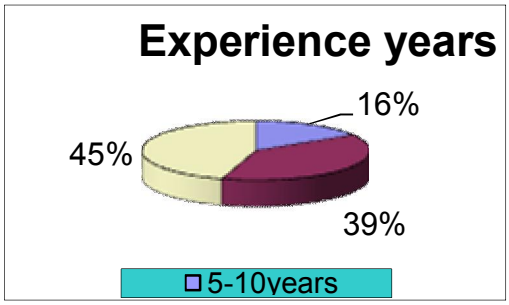

Figure 4. Experience years of the teachers.

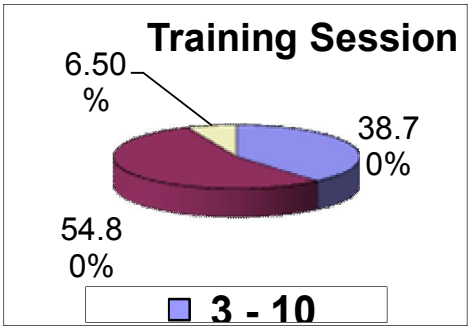

Figure 5. Training Session of the teachers.

Table 6. Correlation between coping and temperament among mentally retarded children.

Variable study	coping	
	r	p
temperament	0.418**	0.000

**Correlation is significant at the 0.01 level

Table 7. Correlation between teacher's concept and coping and temperament among mentally retarded children.

Variable study	Coping		Temperament	
	r	p	r	p
Teacher's concept	0.218	0.238	0.155	0.405

Table 8. Correlation between coping and temperament and socio-demographic characteristics of mentally retarded children.

Items	Coping		Temperament	
	r	p	r	p
Age	**0.037**	**0.673**	**-0.061**	**0.488**
IQ	**0.235****	**0.007**	**0.171**	**0.052**
Sex	**0.145**	**0.100**	**0.076**	**0.388**
Social class	**-0.041**	**0.640**	**0.021**	**0.815**
Father education	**0.122**	**0.174**	**-0.051**	**0.574**
Father job	**-0.160**	**0.073**	**0.068**	**0.446**
Mother education	**-0.005**	**0.958**	**-0.112**	**0.204**
Mother job	**-0.041**	**0.642**	**0.019**	**0.834**

**Correlation is significant at the 0.01 level

Table 10. Correlation between subscale of teacher's concept about mentally retarded children and socio-demographic characteristics of the teachers. (n= 31).

Items	Human being		Understanding		Chance		Future as a citizen	
	r	p	r	p	r	p	r	p
Age	**0.407***	**0.023**	**0.238**	**0.197**	**0.235**	**0.203**	**-0.310**	**0.090**
Education	**-0.563****	**0.001**	**-0.066**	**0.723**	**-0.314**	**0.086**	**0.056**	**0.764**
Experience	**0.346**	**0.056**	**0.165**	**0.375**	**0.180**	**0.334**	**-0.212**	**0.253**
Income	**0.024**	**0.899**	**0.179**	**0.334**	**0.254**	**0.168**	**-0.203**	**0.273**
Sex	**-0.235**	**0.204**	**-0.201**	**0.279**	**-0.172**	**0.355**	**0.223**	**0.227**
Social class	**0.265**	**0.150**	**0.240**	**0.194**	**0.192**	**0.302**	**-0.141**	**0.449**

*Correlation is significant at the 0.05 level

Table 11. Correlation between subscale of teacher's concepts about mentally retarded children.

Items	Human being		understanding	
	r	p	r	p
Human being	**1**	**—**	**0.328**	**0.072**
understanding	**0.328**	**0.072**	**1**	**—**
Chance	**0.242**	**0.189**	**0.415***	**0.020**
Future as a citizen	**-0.239**	**0.196**	**-0.128**	**0.493**

*Correlation is significant at the 0.05 level

Table 13. Correlation between total teacher's concept and subscale of teacher's concept.

Item	Total teacher's concept	
	r	p
Human being	**0.582****	**0.001**
Understanding	**0.765****	**0.000**
Chance	**0.672****	**0.000**
Future as a citizen	**0.288**	**0.116**

** Correlation is significant at the 0.01 level (2-tailed).

4. Discussion:

Results of this study indicated that mentally retarded children were the age ranged from 6-12 years nearly similar finding was reported by Paskiewicz, (2009). Who performed his study in the United States. In a study about A Comparison of Adaptive Behavior Skills and IQ in Three Populations: Children with Learning Disabilities, Mental Retardation, and Autism.who found that The range of age in the study sample was 5-14 years. This may be due to The highest incidence of mental retardation is in school-age children.

The present study has also revealed that more than one third of the children in the sample were male This result was congruence with (Flynn, 2000; Gromoll, 2009; Paskiewicz, 2009) which reports that males are several times more likely to be affected by mental retardation than females.This might be due to mental retardation is about 1.5 times more common among men than among women and The male/female ratio is 1.6:1 in mild mental retardation.

As regards their residance most of the children are from the rural area, This result was in congruence with Awadalla, et al., (2010). Who performed his study Who performed his study In El Minia, Egypt. Mentioned that, more than half of them were living in urban areas. It may be due to the study was conducted in rural area, but even it means that their is a hidden factor in the rural area other than, the marital tradition and heridity, such as polution from the usage of phosphate for cullivation, or nutration.

As regarding source of information, the present study findings revealed that the information taken from mothers in the majority of the cases. This was agreement with Flynn, (2000). Who performed his study In Columbia University. In a study about the teacher-child relationship, temperament, and coping in children with developmental disabilities. Which means that, the mother is loaded of more concerned about the child, the mother is blamed for the child condition than the father and may be due to the mothers are primiry caregivers.and most of the fathers in the study sample were worker and majority of mothers were acompying with the child to the school.

Social status of the child's family ranged between low and middle social class this might be correlated with the child's prevalence of accedent, child's nutration, child's culture, civilization, resources and facilities available to promote and develop the child's intelligence which might lead to such retardation other than any other heridatory factors.

In relation to the marital status of the childs parent, nearly the majority are living within stable marital relation, This finding was agreement with (Llewellyn, etal., 2003; Hand, 2008 and Awadalla, et al., 2010). Who similarly reported that two- third of them were married. Which dosn't mean a happy family relation as it was not assessed, but at least they live with their father and mother, that lead to exclude some of the –ve emotional factor that might play a vital role in the development of social retardation.

Regarding to the IQ of these children, the present study findings revealed that the IQ ranged from 50-71 with Mean $\pm$ SD 56.2-5.2. This finding was nearly similer to Conners, et al, (2004). Who performed his study In Alabama. In a study about Phonological reading skills acquisition by children with mental retardation . Who have mentioned that, the IQ ranged from 39-88 with Mean $\pm$ SD 53.85 (8.80). This may be due to in this study the researcher used the same range of age of these children and IQ ranged from 50-69 is mild mental retardation Can be expected to learn, Can learn up to about the 6th-grade level by late teens.

Personal characterstics of the teachers in this study, indicated that, the majority are adults and old adults, have BSc and were females and they were from urban areas. those positive characteristics of the teacher have an effect on the children coping and temperament. This finding was agreement with (Scott, 2003; AlAjmi, 2006; Hand, 2008; Nitardy, 2008; John et al., 2009 and Gromoll, 2009). This means that, there is a hope in the improvement of the mentally retarded children if they looked after by an educated, positively attituded teachers. And the high level of education for the teachers promote with knowladge and skills to dealing with these children and is important to these children because they need special care and education.

Regarding of the experience years of the teachers, the present study finding revealed that the majority of them were experience years over than 20 years. This finding was similar to Nitardy, (2008). Who performed his study in United States in study about " The Relationship between Career Development and Intent to Stay in a High Turnover Industry, Early Childhood Education and Care". who reported that Length of Time in the Profession were 20 plus years.

This may be due to increase of experience year for teachers is important to understanding these children and how to deal with them.

The present study has also revealed that positively statistically significant correlation between temperament among mentally retarded children and their coping. This result was consistent with (Flynn, 2000;and Angela Gionet, 2007). Who found that this was a significant positive correlation between temperament and coping skills. This might be due to Coping is a self-regulatory process that is not always conscious but may be influenced by temperament. and Children with difficult temperaments are less adaptable and have more negative reactions in school, at home.

Teacher's concept which is concerned with the child as ahuman being, the ability of the child to understand and their chance to be improved as well as their future as a citizen. In the present study revealed that there are only positive significant correlation between given their children a chance and ability of children to understanding. Table (11)

The current study has also demonstrated that their only positively statistically significant correlation between IQ of mentally retarded children and their coping. This result was in agreement with Paskiewicz, (2009) Who performed his study in the United States. In a study about A Comparison of Adaptive Behavior Skills and IQ in Three Populations: Children with Learning Disabilities, Mental Retardation, and Autism. Who found that the relationship between IQ and adaptive behavior in the mental retardation group and the learning disabled group was quite low. The discrepancy might be related to in this study was assessing one group of children. This may be due to Coping is a complex human behavior that is influenced by IQ and temperament and Coping is a process that involves the cognitive selection. therefore, when IQ of those children was higher the coping abilities are increasing.

According to the present study finding, there are positive statistically significant correlation between the teacher's concept as the general and regarding human being, understanding, and chance. but there are no statistically significant correlation between total teacher's concept and future as a citizen. (Table 13). and also not present references in this part of study in egypt and any other places. This may be due to the teachers are beleive that mentally retarded children are over worker and burdan on the government and not able to form family and tolerate to responsablity and improvment ecnomical status.

Regarding correlation between education levels of the teachers and teacher's concept as human being, the current study revealed that this was a negative statistically significant correlation. This result was in congruence with Al Ajmi, (2006). In the Kingdom of Saudi Arabia. In a study about Administrators and Special education teachers' perceptions regarding the use of functional behavior assessment for students with MR. who found that the perception of Saudi administrators and special education teachers regarding the use of functional behavior assessment on the basis of the type of degrees that they hold (bachelors, masters, doctorate, or other) was not statistically significant. This might be the present study using scale of teacher's concept regarding human being but the reference using scale of teacher's perception as functional behavior assessment. My be due to human being of these children is one of rights and teacher's concept for mentally retarded children as human being not require level of education but it is internal drive and empathy.

5. Conclusion:

Based on the findings of the present study, it can be concluded that: when IQ of those children was high, the coping abilities increased. The coping abilities and temperament are significantaly and positively correlated. no statistically significant associations between teacher's concept with temperament and the coping abilities.

Recommendation:

Based on the main study findings, the following recommendeation are suggested:

- The teachers should be continuously observe and evaluate of their children to recognize the temperament and coping abilities and their behaviors during day time in the class.
- Dealing with children by love, sympathy, empathy and caring.
- Allow the parents to Participation in the Rehabilitation programs, which includes all social, psychological, medical, educational and vocational.
- Emphasize teacher's positive relationships with child to enhance the child's coping abilities.
- Integrate the disable child with the system of education of the normal children to develop positive attitudes and meaningful friendships between children with and without disabilities.
- Providing these children with recreational and social facilities that help them to ventilate their energy.

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Influences of Weight and Row Width of Tubers from True Potato Seed on Growth and Yield of Potato

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Abstract: Quality tuber seed, higher seed price and improved production practices are the major constraints of potato production in Bangladesh. Varying weight of seedling tuber such as 1-5 g, 6-10 g, 11-20 g and 21-30 g were planted at 10-, 15-, 20-, 25- and 30-cm row width, respectively to investigate the effects of true potato seed (TPS) seedling tubers weight and row width on growth and yield of potato. Dry matter accumulation and tuber yield was significantly influenced by the weight of TPS seedling tubers and row width. The largest weight of TPS seedling tuber (21-30 g) planted at 30-cm row width produced the highest yield (>39 t ha^{-1}) and it was identical with TPS seedling tuber weight of 1-5 g, 6-10 g and 11-20 g planted at 10-, 15 and 20-cm row width, respectively. Leaf dry matter, tuber dry matter and total dry matter had a strong positive correlation on tuber yield. The regression equation predicted that for every 1.0 g leaf dry matter (LDM) accumulation, 2363 g tuber was gained. The smallest weight (1-5 g) of TPS seedling tuber planted at 10- and 15-cm row width is suggested for cultivation practices to minimize production cost that could provide sustainable economic production of potato in Bangladesh.
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Keywords: Growth; True potato seed; Seedling tuber; Dry matter; Tuber yield

1. Introduction

The yield of potato (*Solanum tuberosum* L.) is very low in Bangladesh as compared to potato-growing countries of the world. The area of potato cultivation is increasing rapidly over time due to congenial climatic conditions particularly prolonged winter in the north-west region in Bangladesh. Unfortunately the yield level is not satisfactory yet due to scarcity of quality tuber seeds and its higher cost, improper agronomic practices and rapid dissemination of degenerative diseases (Mahmud et al., 2009). The total requirement of seed potatoes is about 0.38 million tons in Bangladesh. Out of this quantity, only 4-7% of the total requirements are good quality. The rest quantity of seed (93-96 %) is covered by the farmer's seed or ware potatoes which are very poor in quality (Banik, 2005; Mahmud et al., 2009). Replacement of farmer's seed with high quality seed potatoes would make a significant contribution towards an increased yield of potato in Bangladesh (Siddique and Rashid, 2000).

Potato seed tubers account for approximately 12 to 15% of the total operating costs to raise potatoes (Patterson, 2007). In addition to the cost of seed tubers, cost per unit area is determined by weight of tuber seed per piece, in-row spacing and distance between rows (William et al., 2011). Each of these factors can affect not only total tuber yield but also size distribution of the harvested tubers (Wurr, 1974). True potato seed is a promising technology which can minimize seed cost and has shown higher yield potentiality in some countries (Upadhya, 1987; Pallais 1994). There are three alternatives for using TPS to raise potato crop. These are direct seeding, transplanting of TPS seedling in the field and use of TPS to produce seedling tubers in nursery beds or fields which are used as planting materials for raising a ware potato crop for the following year. Out of those methods, ware potato production using TPS has been reported to be advantageous (Rashid et al., 1993). The small tubers derived from TPS progenies have high yield potential regardless of planting method and do not show any genetic variation. The small tubers (1-5 g) obtained from true seeds are useful as seed tubers (Rasul et al., 1997) which has enough scope for producing quality seed potato as well as ware potato using TPS seedling tubers thereby boosting up the potato production in Bangladesh.

Optimum planting density along with size of tubers is one of the most important factors of the production practices of potato cultivation. Numerous studies have been conducted showing the effects of planting a constant seed piece size at differing in-row spacing on yield and quality of potatoes (Arsenault et al., 2001), but no sufficient research work has been

carried out to find out the optimum seed size to cultivate potato using TPS seedling tubers specially in Bangladesh. There is a scope to disseminate this new technology in large scale among the potato growers to boost up the potato production. Hence, it is essential to determine an appropriate production package for potato cultivation using TPS seedling tubers. Cognizant of the above facts, a program was designed in order to assess the performance of TPS 1 cultivars as influenced by weight of seedling tuber and row width on growth and yield of potato in the north-west region of Bangladesh.

2. Material and Methods

Site description and experimental design

The study was conducted in the field of Breeder Seed Production Farm of Tuber Crops Research Centre, Bangladesh Agricultural Research Institute (BARI), Debiganj, Panchagarh, (29.1^0 N latitude, 88.5^0 E longitude and at altitude of 39.4 m above the sea level) Bangladesh. The soil is a loam. The soil organic matter was 1.3%, soil bulk density was 1.45 (g cm^{-3}), total N 0.08%, available P was 13.20 (µg g^{-1}), exchangeable K was 0.162 (meq100 g^{-1}). The land was well prepared by tractor driven disc plough followed by laddering. The size of a unit plot was 6.0 m x 5.6 m. Four levels of TPS seedling tuber weight such as 1-5 g (<15 mm), 6-10 g (15-20 mm), 11-20 g (21-30 mm), 21-30 g (31-45 mm) and five levels of row width (10-, 15-, 20-, 25- and 30-cm corresponding to 17, 11, 8, 7 and 6 tuber m^{-2}) were tested. The treatment combinations were arranged in a factorial randomized complete block design with 3 replications. The tested TPS seedling tubers were developed by BARI and certified as TPS-1 cultivar (Razzaque et al*.,* 2000).

Crop management

Well-sprouted tubers were planted in the furrows as per treatment. Nitrogen, P, K, S, Mg, Zn and B was used at the rate of 140, 15, 100, 16, 10, 3 and 1.2 kg ha^{-1}, respectively. The source of N, P, K, S, Mg, Zn and B was urea, triple super phosphate, murate of potash, gypsum, magnesium sulphate, zinc sulphate and boric acid, respectively. Applied fertilizers and planted tubers were covered with soils properly making a ridge. Then two furrows at a depth of 5-6 cm were made 10-12 cm apart from furrow having planted tubers where half of N and all other fertilizers applied. The planting was done on 3rd week of November. Weeding was required once to keep the plots weed free. Irrigations were provided at stolonization (22-23 days after planting (DAP)), tuberization (33-35 DAP) and bulking (55-56 DAP) period, respectively. Earthing up was done once followed by top dressing of remaining N was applied at 30-32 DAP. Preventive measures were taken to control virus and blight diseases applying appropriate insecticides and fungicides. Furadan 5 G at the rate of 15 kg ha^{-1} was applied in furrows (depth 5-6 cm) to control cut worm. Dithane M-45, Acrobat MZ-2 and Tafgard were applied at the rate of 2 kg, 1.5 kg and 1 L, respectively. Dithane M-45 and Acrobat MZ-2 was applied twice while Tafgard was applied four times. Plants were dehaulmed at 105 DAP and tubers were harvested at 7 days after dehaulming.

Data collection and statistical analysis

Dry matter collection was recorded from randomly pre-selected 3 m^{-2} areas per plot during harvesting. Five hills were uprooted at 15-days regular intervals commence from 30 DAP to 105 DAP to determine components of dry matter accumulation. After harvesting plants were separated into leaf, stem and tuber and weighed. Sub samples of each were dried in an oven at 70^0 C for 72 hours for estimation of leaf, stem and tuber dry matter. After dehaulming randomly 5 hills were harvested to record the number of tubers (≥10 mm diameter tuber was considered as tuber) and fresh weight of tuber per hill. Fresh tuber yield was harvested from randomly pre-selected central areas (about $12m^{-2}$) of each plot and converted into tons per hectare (t ha^{-1}).

Mean data was analyzed statistically and was carried out to analysis of variance (ANOVA) using general linear model to evaluate significant differences between means at 95% level of confidence. It was performed using the Statistical Analysis System (SAS 2003). Further statistical validity of the differences among treatment means was estimated using the Duncan's New Multiple Range Test (DMRT) comparison method. Microsoft Office Excel 2007 was used for regression analysis.

3. Results and Discussion

Dry matter accumulation

Treatment combination had significant influence on leaf, stem, tuber and total dry matter accumulation. The highest LDM (126 g m^{-2}) was obtained from the largest weight (21-30 g) of TPS seedling tubers when planted at 25-cm followed by 15-, 20- and 30-cm row width and seedling tuber weight of 11-20 g planted at 10-, 15- and 20-cm row width and 6-10 g TPS seedling tuber weight planted at 10- and 15-cm row width and 1-5 g seedling tuber weight planted at 10-cm row width. On the contrary, the lowest LDM yield (73 g m^{-2}) was recorded from 1-5 g seedling tuber weight planted at the widest row width (30-cm). The TPS seedling tuber weight of 11-20 g planted at 10-, 15- and 20-cm row spacing produced higher LDM and thereafter decreased with each incremental increase of row width (Table 1). The smaller TPS seedling tuber size (6-10 g) planted at closer row width (10- and 15-cm) also produced better LDM and thereafter decreased significantly at each incremental increase of row width. The smallest

weight of (1-5 g) TPS seedling tuber planted at 10-cm row width produced also relatively higher LDM and decreased at each incremental increase of row width. The highest LDM was obtained due to larger tubers and it was possibly

Table 1. Leaf dry matter accumulation as influenced by TPS seedling tuber weight and row width

Tuber	Row spacing (cm)				
wt. (g)	10	15	20	25	30
1-5	118 a	105 bc	97 cd	86 e	73 f
6-10	120 a	124 a	107 b	91 cd	82 e
11-20	119 a	120 a	122 a	115 b	102 b
21-30	113 b	119 ab	122 a	126 a	116 a

Means followed by the same letters are not significantly different at P≤ 0.05 using DMRT

due to more accumulation of carbohydrates and produced more photosynthetic organ than the smaller tubers. Closer row width produced comparatively higher LDM than that of wider row width in case of smaller TPS seedling tuber weight. The higher LDM was obtained at the closer row width and it might be due to more number of plants present per unit area. Regardless of seedling tuber weight and row width LDM was increased up to 75 DAP and thereafter declined up to end of the growing season (data not shown). In all cases declining rate of LDM was probably due to leaf senescence and translocation of minerals from source to sink. Leaf dry matter yield increased with each incremental increase in TPS seedling tuber weight. These results corroborated the findings of Basu (1986), Midmore (1988) and Singh et al., (1997b). The results revealed that row width of 10, 15, 20 and 25-cm was better corresponding to 1-5 g, 6-10 g, 11-20 g and 21-30 g TPS seedling tuber weight, respectively to obtain more LDM.

The highest SDM was recorded by the largest weight (21-30 g) of TPS seedling tuber planted at 10-cm row width followed by 11-20 g TPS seedling tuber weight at 10-cm row width (Table 2). On the contrary, the smallest TPS seedling tuber weight (1-5 g) planted at the widest row width (30-cm) produced minimum SDM (20 g m^{-2}) which was identical with same weight of TPS seedling tuber planted at 25-cm row width and 6-10 g seedling tuber weight planted at 30-cm row width. These results are consistent with findings of Singh et al., (1997b) and Nandekar (2005).

Table 2. Stem dry matter accumulation as influenced by TPS seedling tuber weight and row width

Tuber	Row spacing (cm)				
wt. (g)	10	15	20	25	30
1-5	51.3 c	38 f	29 h	24 ijk	20 k
6-10	53 bc	41 ef	32 gh	26 ij	22 jk
11-20	57 ab	46 d	39 ef	33 g	28 hi
21-30	60 a	50 cd	41 de	36 fg	32 gh

Means followed by the same letters are not significantly different at P≤ 0.05 using DMRT

The SDM yield increased with each incremental increase in TPS seedling tubers. The larger seedling tuber weight at closer row width always produced higher SDM yields than that of smaller TPS seedling tuber weight at wider row width. Maximum tuber dry matter (TuDM) was produced by the largest weight (21-30 g) of TPS seedling tuber planted at 20, 25 and 30-cm row width followed by 11-20 g TPS seedling tuber weight planted at 20 and 25-cm row width and 6-10 g TPS seedling tuber weight planted at 10 and 15-cm row width and the smallest weight (1-5 g) of TPS seedling tuber planted at 10-cm row width. Tuber dry matter increased significantly with each incremental increase in seedling tuber size at wider row width. Higher TuDM yield was possibly due to larger tuber weight (6-10 g and 11-20 g) planted at closer row width produced higher number of plants and more tubers per hill per unit area. The largest TPS seedling tuber weight planted at the widest row width produced higher TuDM. The smallest weight (1-5 g) of TPS seedling tuber planted at 10-cm row width produced maximum TuDM (984 g m^{-2}) while with same weight of TPS seedling tuber planted at 30-cm row width produced minimum TuDM yield which was at par with 20 and 25-cm row width (Table 3).

Table 3. Tuber dry matter yield as influenced by TPS seedling tuber weight and row width

Tuber	Row spacing (cm)				
wt. (g)	10	15	20	25	30
1-5	984 b	874 c	717 d	690 de	607 e
6-10	990 b	1064 ab	975 b	878 c	769 d
11-20	968 bc	983 b	999 b	984 b	982 b
21-30	962 bc	969 bc	987 b	997 b	1108 a

Means followed by the same letters are not significantly different at P≤ 0.05 using DMRT

Nandekar (2005) also reported that higher dry shoot yield was obtained by higher planting density resulted in higher tuber yield. Tuber dry matter yield increased by smaller weight of TPS seedling tuber with closer row width and it was possibly due to higher accumulation of LDM and SDM. The results revealed that the largest weight (21-30 g) of TPS seedling tuber planted at 20, 25 and 30-cm row width performed better. On the contrary 11-20 g seedling tuber size planted at 20 and 25-cm row width grew well compared with other row width. The smaller TPS seedling tuber weight (6-10 g) planted at 10 and 15-cm row width produced higher TuDM than that of other row width. The smallest weight (1-5 g) of TPS seedling tuber planted at the closest row spacing (10-cm) obtained appreciable

TuDM yield (983.7 g m^{-2}) compared with the other row width.

Total dry matter is an additive effect of LDM, SDM and TuDM. Maximum TDM was obtained by the largest weight (21-30 g) of TPS seedling tuber planted at 30 cm row width followed by 20-cm row width with same weight of TPS seedling tuber weight. These results were identical to 1-5 g, 6-10 g and 11-20 g TPS seedling tuber weight planted at 10-cm and 10, 15 and 25-cm row width, respectively (Table 4). The lowest TDM was recorded from 1-5 g seedling tuber weight planted at 30-cm row width which was identical to 25- cm row width. The smallest weight (1-5 g) of TPS seedling tuber planted at 10-cm row width produced appreciably higher TDM (1151.9 g m^{-2}) and thereafter yield decreased significantly with each incremental increase of row width. Similarly 6-10 g seedling tuber weight planted at 10 and 15-cm row width recorded higher TDM compared to 25 and 30-cm row width.

Table 4. Total dry matter (kg m^{-2}) accumulation as influenced by TPS seedling tuber weight and row weidth

Tuber	Row spacing (cm)				
wt. (g)	10	15	20	25	30
1-5	1.15 b	1.02 c	0.84 de	0.80 e	0.70 f
6-10	1.16 b	1.23 a	1.11 b	0.99 c	0.87 d
11-20	1.14 b	1.15 b	1.13 b	1.16 b	1.11 b
21-30	1.14 b	1.14 b	1.15 b	1.16 b	1.26 a

Means followed by the same letters are not significantly different at P≤ 0.05 using DMRT

Smaller tuber weight at closer row width had a significant role to produce higher TDM while larger weight of TPS seedling tuber with wider row width did well to accumulate TDM. These findings are in agreement with the findings of Singh et al., (1997b); Midmore (1988); Basu (1986); Santoso and Blamely (1985). The results revealed that the combinations of 1-5 g TPS seedling tuber weight planted at 10-cm row width, 6-10 g TPS seedling tuber weight planted at 10 and 15-cm row width, 11-20 g TPS seedling tuber weight planted at 25-cm row width and the largest weight (21-30 g) of TPS seedling tuber planted at 25 and 30-cm row width produced higher TDM.

Tuber yield

Tuber number of tuber per unit area and tuber yield was influenced significantly by the treatments. The highest number of tuber per unit area was obtained by 21-30 g seedling tuber weight planted at 10-cm row width (Table 5). Minimum number of tuber per unit area was recorded by 1-5 g and 6-10 g TPS seedling tuber weight planted at 30-cm row width. Number of tubers per unit area decreased with each incremental increase of row width regardless of TPS seedling tuber weight. On the contrary number of tubers per hill decreased at closer row width regardless of seedling tuber size (data not shown). An inverse relationship was observed between tuber numbers per hill per unit area. Tuber number is a function of stem population (Cho and Iritani, 1983; Islam et al., 1997) but is also influenced by cultivars and several other factors, which Control vegetative growth. The higher number of tuber

Table 5. Number of tuber per square meter as influenced by TPS seedling tuber weight and row width

Tuber	Row spacing (cm)				
wt. (g)	10	15	20	25	30
1-5	206 d	142 gh	113 j	95 k	79 m
6-10	221 c	152 f	124 i	102 j	87 l
11-20	233 b	161 e	132 i	109 j	92 k
21-30	247 a	169 e	132 hi	112 j	94 k

Means followed by the same letters are not significantly different at P≤ 0.05 using DMRT

Per hill produced from larger size of tuber and it was possibly due to higher number of stem per hill and translocation of minerals from source to sink. These results are in agreement with the findings of Adhikari (2005) and Batra et al., (1992). They reported that tuber number per plant increased with increase in seedling tuber size which also indicates that the number of main stems per plant has positive bearing on number of tubers per plant. The results corroborate with the findings of Wiersema (1984) and Kadian et al., (1988). Similar relationship was also observed by Engels et al., (1993a). Thus, it is clear that larger seedling tuber size (11-30 g) planted at a closer row width (10-cm) can produce higher number of tuber per unit area.

Maximum tuber yield was produced by 21-30 g seedling tubers planted at 30-cm row width followed by 11-20 g seedling tuber size planted at 20-cm row spacing, 6-10 g seedling tuber size planted at 15-cm row width and 1-5 g seedling tuber size planted at 10-cm row spacing, respectively (Table 6). The lowest tuber yield was obtained by the smallest size (1-5 g) of TPS seedling tuber planted at the widest (30-cm) row width. It was also noted that 21-30 g seedling tubers planted at 10-cm width produced lower yield compared with other row width while by the use of same size of TPS seedling tuber produced higher yield with each incremental increase of row width. Tuber yield increased significantly with decrease in row spacing in case of 1-5 g and 6-10 g seedling tuber sizes. An inverse relationship was

observed between the largest and smallest seedling tuber size corresponding to widest and closest row width, respectively. Tuber yield decreased as row spacing increased, which is in agreement with previous studies (Arsenault et al., 2001; Love and Thomson, 1999) The higher yields obtained from larger seedling tubers was probably due to the combined effects of better vegetative growth resulting in assimilation of more carbohydrates and also more number of tubers per unit area. The tuber yield (38.8 t ha^{-1}) obtained by the smallest weight of (1-5 g) TPS seedling tubers planted at 10-cm row width was about 8% and 31% higher than that of 15- and 30-cm row width, respectively.

Table 6. Tuber yield (t ha^{-1}) as influenced by TPS seedling tuber weight and row width

Tuber	Row spacing (cm)				
wt. (g)	10	15	20	25	30
1-5	38.8 a	35.9 de	31.0 f	28.2 g	26.7 h
6-10	37.5 bc	38.9 a	35.1e	31.9 f	28.7 g
11-20	36.8 bcd	36.8 bcd	38.9 a	35.9 d	31.2 f
21-30	36.1 d	36.3 d	36.4 c	37.8 b	39.9 a

Means followed by the same letters are not significantly different at P≤ 0.05 using DMRT

In case of TPS seedling tuber size (6-10 g) planted at 15-cm row width produced maximum tuber yield (38.9 t ha^{-1}) which was at par with yields recorded from 10-cm but differed from 20, 25 and 30-cm row width. The tuber yield obtained by 6-10 g seedling tuber weight planted at 15-cm row width was about 11-26% higher than that of 20, 25 and 30-cm row width. Similarly tuber yield obtained by 11-20 g seedling tuber weight planted at 20-cm row width was about 20% higher than that of 30-cm row spacing. The seedling tuber size of 21-30 g planted at 30-cm row width produced 39.9 t/ha and it was 10-39% higher than the other counterpart. This result revealed that larger TPS seedling tuber weight with wider row width and smaller seedling weight with closer row width performed better to obtain higher yield. The results are in agreement with findings of Deka et al., (1996a) and Islam et al., (1997). Considering tuber yield the TPS seedling tuber weight of 1-5 g, 6-10 g, 11-20 g and 21-30 g planted at row width of 10, 15, 20 and 30-cm, respectively is suggested for higher production of potato.

Correlation analysis

Tuber yield is positively correlated between TDM (r=0.92), LDM (r=0.94), SDM (r=0.70), TuDM (r=0.90) and number of tuber (r=0.54). The regression equation predicted that for every 1.0 g TDM accumulation, 238 g tuber was gained. On the contrary for every 1.0 g LDM accumulation, 2363 g tuber was gained. The slopes of regression equation indicated that for every 1.0 g SDM accumulation, only 228 g tuber was gained (Table 7). This positive correlation suggests that different seedling tuber size planted at varying row spacing has strong relation to increase the biomass of plants which has the capacity to produce higher tuber yield. Tuber yield was positively correlated to plant biomass due to the increased plant tissue to accumulate more nutrients from soil. Higher biomass indicates that plants were bigger, healthy and might possess higher photosynthesis rate so that more carbohydrate accumulation and nutrient uptake took place. Despite the positive correlation between tuber yield and SDM yield in plants, the correlation between tuber yield and SDM was a bit weak in this study. However, LDM contributes to the vigorous growth of plants. As a result, the higher biomass of plants produced higher yield.

Table 7. Regression equation, correlation coefficient (r) and coefficients of determination (R^2) of different parameters

Regression equation	r	R^2
$Y_1 = 0.0238x_1 + 9.4568$	0.92**	0.85
$Y_2 = 0.2363x_2 + 9.2497$	0.94**	0.88
$Y_3 = 0.0228x_3 + 26.341$	0.70*	0.48
$Y_4 = 0.0269x_4 + 10.054$	0.90**	0.81
$Y_5 = 0.0408x_5 + 29.221$	0.54*	0.53

Y_1, Y_2, Y_3, Y_4 and Y_5 = Tuber yield, x_1 = Total dry matter; x_2 = leaf dry matter, x_3 = stem dry matter; x_4= tuber dry matter, x_5 = number of tuber per square meter

*significant at 0.05 level of probability and ** significant at 0.01 level of probability

Conclusions

The larger seedling tuber size planted at wider row width and smaller TPS seedling tuber weight planted at closer row spacing was better to produce higher tuber yield. The effects of varying TPS seedling tuber size planted at different row width on economic return will depend on the cost of TPS seedling tuber and the price for harvested potatoes when sold. The tuber yield data appears that TPS seedling tuber weighing approximately 21-30 g planted at 30-cm row width, 11-20 g planted at 20-cm row width, 6-11 g planted at 15-cm row width and 1-5 g planted at 10-cm row width produced satisfactory yield and quality of TPS-1 cultivars in this study. Considering yield and expected economic returns, the smallest weight of (1-5 g) TPS seedling tuber with 10 and 15-cm row width obtained profitable yield compared with other combinations.

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Promotion of systematic analysis model recreation potentiality of forest park by using water resource factor (Abidar forest park of Sanandaj city in Iran)

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Abstract: The systematic analysis model (Makhdum, 1385) considers 6 elements of gradient, soil, direction, water, planet and climate to evaluate recreation potentiality of forest parks. In this survey in order to evaluation of recreation potentiality of Abidar forest park which is located in south western part of Sanandaj, with the surface of 1555 hectare, in addition to the fore mentioned elements according to the conditions of region, the water resources factor is also considered to promote systematic analysis model. Using systematic analysis model in geographic data system the map for recreation potentiality was provided. The results of this evaluation show that the under study region doesn't have first class concentrated recreation potentiality. 29% of the area has second class concentrated recreation, 38% of the region has wide spread first class recreation potentiality and 33% is of wide spread second class recreation potentiality. In order to study the impacts of an effective factor by visitors of the region, 450 questionnaires were distributed among the tourists in the region. The results show that most of the visitors announced the availability to water resources as a reason to choose the recreation region. To promote the systematic analysis model and study the effect of water resources factor on different classes of recreation based on systematic model, the map of buffer was provided and with recreation potentiality map based on systematic model was incorporated and the final recreation potentiality map was obtained. The results of this evaluation showed that 6% of region area includes first class concentrated recreation potentiality, 28% of region area second class concentrated recreation potentiality, 35% first class widespread recreation potentiality and second class widespread recreation potentiality is covered 31% of the area. Comparing two recreation potentiality maps shows that in systematic analysis model, the region doesn't have first class concentrated recreation place, but if the water resources factor is scored, 6% of the region will earn first class concentrated recreation potentiality. The results of this survey show that water resources factor, herbal coverage, accessibility ways and physical factors (gradient and direction) have the most effect on evaluation process of recreation potentiality in the region as they are mentioned in order of effectiveness. While the effective parameters in recreation potentiality evaluation in systematic analysis model are gradient, soil, direction, water, plant, and climate.

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Keywords: recreation potentiality, systematic analysis model promotion, geographic information system, Abidar forest park.

1. Introduction

Nowadays, tourism industry has found a crucial role in relaxation, national economy, exporting achievements, tax incomes, employment for youth and income production for the rural parts in order to prevent their immigration to cities and protecting natural resources. Thanks to these effects, tourism attractions are enumerated as unique investments of every country and region that identifying categorizing and introducing of this crucial factor is very important in Development Plan and employment. In recent decades, population growth and communication improvement has strikingly caused in travel and transition in the world. Urbanity process and tedium of work environment make an intense tend to recreation and promenade, especially in industrial societies, and it has created a deep concern regarding extreme fertilization of environment and natural resources. So, it is needy to structuring forest parks and natural recreation places is necessary in order to protect natural resources and reservations, tourist attractions, income production, relaxation and spending leisure time (Awladi, 2005).

Land preparation is an enterprise that has been taken wisely to benefit the natural resources in order to prevent destroying nature, and also to benefit the natural resources. According to ecological power, the evaluation of ecological power for different usages, such as recreation, is an effective step to reduce these damages (Majlajpoor, 2004). In using evaluation ecological power of land in many cases, almost all of the capabilities of natural resources are

surveyed and identified and only in special cases one or two ecological resource would be enough (Makhdum, 2006) With urbanism development and destruction of natural ecology, the need of green spaces to create ecological balance is burgeoning.

Today's green space is one of the most important vitalization systems of human being. Referring to the vital importance of green space in the world is necessary not only because of its economical value but also because of the significance of it in environment by having this point in mind that green space is enumerated as urban respiratory way and its lack results to mental and physical healthy disorders.

In parallel with irreversible industrial development importance of green space especially trees would be more understandable (Hidred, 2001). So, Evaluation of recreation capability is to determining the capability of region for ecotourism and recreation use. Capability and recreative potentiality is evaluated in different method that the most common assessment method in Iran is systematic analysis model of Makhdum. In assessment method of Makhdum recreation potentiality at first ecological resources are identified. Then they turned into the plan and compiled with each other and the outcome was environmental unit plans. Comparing this unit and Makhdum tourism ecologic model, every unit's obtained which are potentialities for recreation.

Ecologic potentiality assessment process has been done without using powerful equipments, but surely it was so difficult, costly, time consuming and full of errors. While today geographical data system in identifying resources and optimized analysis of users are noticeable (Hathout**,** 2002).

Bejerk and others (2006) have studied the relationship between density of herbal coverage in forest parks and visitors' general recreation. The results showed that those parks that are more suitable in terms of herbal coverage and density in attracting visitors have more capability in attracting visitors.
Finally we can say that different types and ranks of recreation depend on water resources and density of herbal coverage that these factors in addition to physical ones are effective in determining recreation potentiality of park.

Analyzing different studies shows keeping dynamism, quality and quantity of natural resources so as to permanent utilization of them, is necessary that its prerequisite is recognizing potentiality and capability of the region in terms of slightly purpose. There are many researches in Iran based on systematic analysis model. Mahmudi (2007) showed that in addition to physical factors, the effect of other factors such as abuting to population focal, accessibility to the region, existence of special attractions, play grounds and water resources must be noticed. In this paper, in order to promote systematic analysis model and considering the conditions of significant region moreover physical factors the effect of water resources factor in recreation is evaluated.

2. Methods and Materials

2.1 Materials

Abidar park with approximate scale of 1555 hectare in the south western of Sanandaj that is located between 46˚ , 59', 12" to 46˚, 55' , 24" and 35˚, 19' , 24" and 35˚ , 15' ,52" north latitude and the average height of the area is 2073 m above sea level. Geology formation of the region includes three geomorphologic units, black grey chills, volcano stones and residual of kwaterner. Climate is one of the essential and better factors in tourism planning. The studies show that climate is the most important tourism attraction resource in natural environment. In order to study region's climate we used different methods and mid-dry climate obtained.

2.2 Research method

In order to evaluate recreative potentiality of Abidar forest park systematic analysis model that is the most common method to identify assessment and utilizing plan of land worldwide including Iran. Due to this, first the map of numeral topography 1, 25000 Sanandaj has been provided from National topography organization of Iran. Then by frontage operation of approximate scope of the area, the specific map is identified. Then by using scan method numeral site span interred into computerized software system. In order to determine exact boundaries of the park, ground removal by using GPS has been done. The available data interred in to the computer using Arcgis software system and the exact boundary of park determined. This boundary interred in to the topography map which is used in providing other maps. Gradient, direction and altitude maps in Arc/view 3.3, ARC GIS 9.1 software are provided. Then by compilation of them the earth shapes map has obtained. The second step includes and gathering of resources. In this step with collecting soil, and earth shape unit, the map of primitive potentiality of recreation map obtained. In the third step the assessment of environmental units is done. In order to study the effect of water resources factor in choosing under-study recreation region and in order to have a more real view of the effects of these factors in choosing recreation region among tourists.450 questioners are distributed among those who were there as tourists in that region.

3. Promotion of systematic analysis model by using water resources factor

By identifying the importance of water resources factor in recreation all spots which are related to water resources(such as well) has been chosen by using GPS removed and has been given to software in order to establish data strand and then its map provided-figure 7 shows the situation of well in Abidar park. Based on information about choosing the recreational capability in jungles and pampas organization of country the maximum distance of water resource of recreational region is about 300m. Based on this by using Arc GIS 9.2 software around water resources of case study region is buffer 300m and its map provided (figure 7). In next step the water resources map with recreative potentiality map that is obtained by systematic analysis model incorporated and the last recreational potentiality map provided.

4. Results

4.1 Results from maps

The obtained results of gradient map showed that 1% of Abidar park surface has a slope of 0-5%, 14% has 5-15% , 41% has 15- 25% and 44% has 25-50%.

Considering these results, the most surface of the park is located between 15- 25 and 25-50 (figure 1). Based on the map, the classes of geographical direction 26% of park are 10% south ward, 6% west ward and 58% east ward. Due to these results Abidar forest park is more east ward oriented (figure 2).

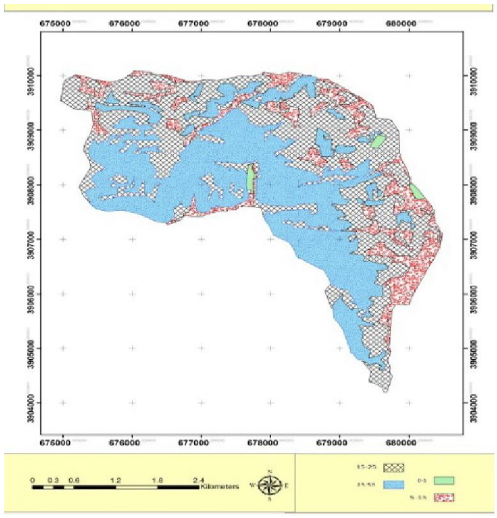

Figure 1. Gradient Map of Abidar Forest Park

Based on provided numeral-height model, park is located in the height range of 1600- 2500m of sea level. Latitudinal map is provided with 5 classes According to height map, the park is in height range of 1600-1800m from sea level (figure 3).

Based on soil map (figure 4) 60% of park's surface has loamy fibre, 3% sandy,clay, 20% clay loamy, 17% clay loamy.

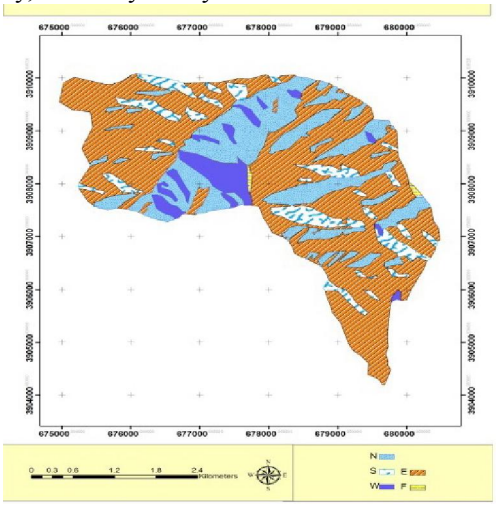

Figure 2. Direction Map of Abidar Forest Park

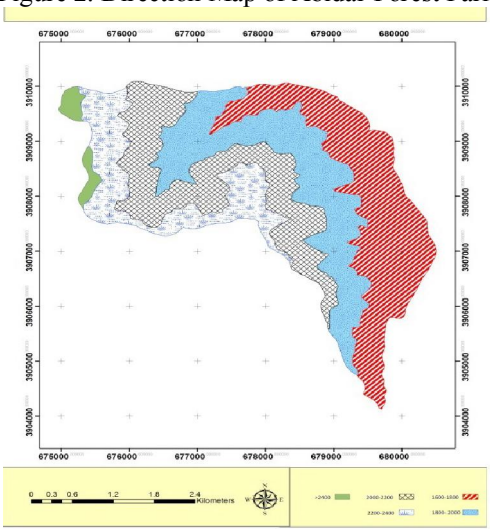

Figure 3. Height Levels Map of Abidar Forest Park

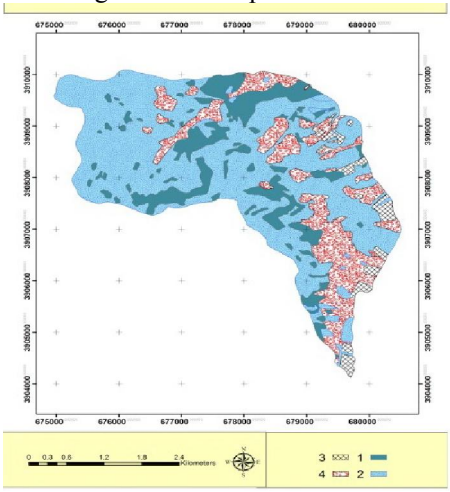

Figure 4. Soil Fibre Map of Abidar Forest Park

Based on these results, most of the park's surface has herbal coverage, less than 10% which it has a big effect on recreation (figure 5). The results of evaluating recreational capability of Abidar forest park in addition to surveying the elimination of slope 0-5 in the region when the layers are incorporating so the other parameters were not considered and we identified that Abidar forest park doesn't have intensive recreational potentiality in first class, 5% of Abidar park has intensive recreative potentiality in second class, 50%(7576440 hectare) widespread recreative potentiality in first class and 45% of park surface has widespread recreative potentiality in second class (figure 6).

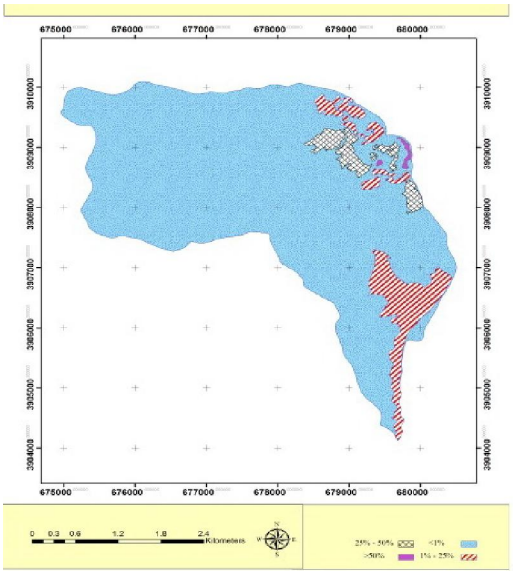

Figure 5. The Map of Plant Dense of Abidar Forest Park

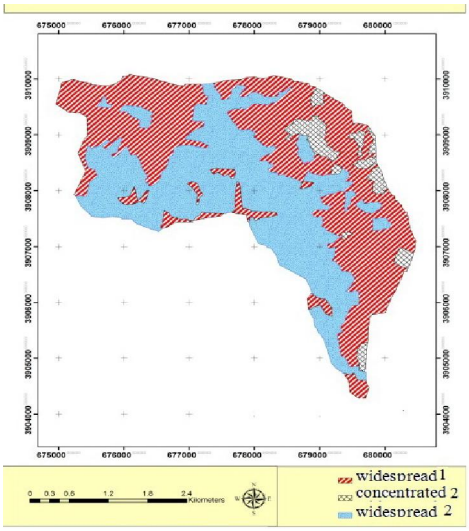

Figure 6. The Map of Environmental Units of Abidar Forest Park

4.2 Results study reasons of recreative case study region by tourists

According to these surveys about water resources and well has the biggest effect on choosing the place of settlement .The second criteria for choosing the sitting place are herbal coverage park characteristics, suitable herbal coverage , and using trees shadow.

4.3 The results of the effects of water resources factor and the way of accessing them in recreation potentiality

The existence of water resources which provide the drinkable water for tourists is one of the most crucial criteria in choosing the recreational places. And basically the areas which are away from drinkable water resources or it is impossible to carry water to there are not suitable for stationing concentrated recreation places. Involving the water resources recreational regions that their maximum distance from park is water resources was 300 meters consider as level 1 concentration areas. Also the areas which have suitable slope and have a reasonable distance from the water resources, up to 300 meters, can be considered as places which have the potentiality for locating the level 2 concentration re creation. By doing this and comparing both a/d and new maps, we can evaluate the effects of the available water resources in parks (figure 7). The results of the evaluation of recreation potentiality of Abidar, involving water resources, show that 2 percent (about 23,827 hectare) of Abidar recreational park has level 1 recreational potentiality. 23 % (339/036 Hectare) has second level, 31% (467/7040 Hectare) has wide level 1 recreation and 44 % (675/8450 Hectare) has level 2 potentiality (figure 8).

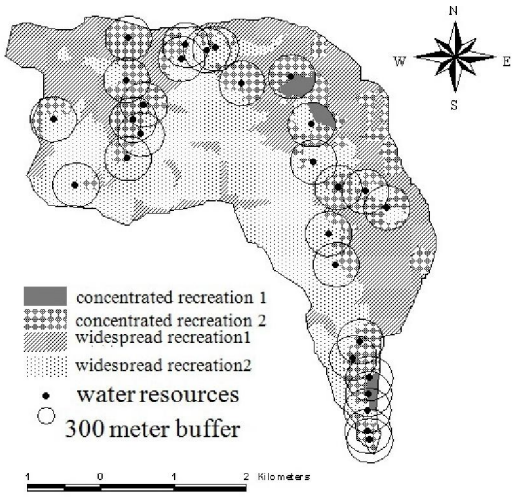

Figure 7. The Map of 300 meter buffer around water resources

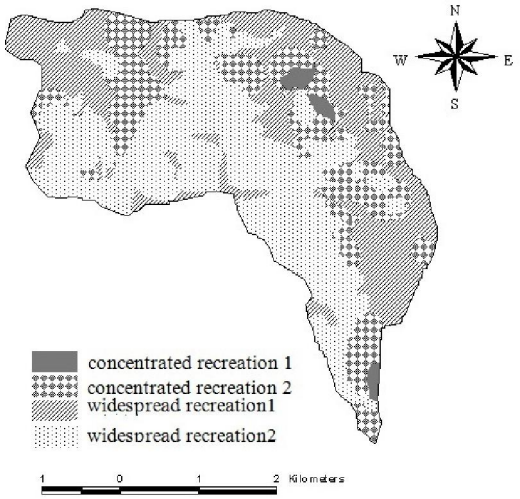

Figure 8. The final map of recreation potentiality of the park including water resources

5. Discussion and conclusion

5.1 Determining recreation potentiality according to Abidar forest park systematic analysis

According to conclusions of references above and according to the ecologic model used in Abidar forest park due to mountainous geographic situation showed that there isn't much low slope lands to start the level one concentrated recreation. 5%(73/6180 Hectare) of Abidar park has the potential for level 2 concentrated recreation which if it is possible to built tourist facilities there. As Taheri (2006)**,** assessed nature attractions of Abas Abad Vemsak the obtained results showed that the mentioned area due to its high slope and high altitude for level one concentrated recreation tourism is not suitable. And only 3.34% of area has the level 2 concentration recreation. In Abidar forest park 50 %(757/6440 Hectare) of the park has the potential for level one widespread recreation and 45 %(675/111 Hectare) has potential for level 2 wide spread recreation. Esmailie sari (2003), evaluated Chitger Park to determine the level of wide recreation and 5.5% of the park surface is suitable for concentrated recreation and 68% of the park is suitable for widespread recreation.

5.2 Determination of the effective factor on different classes by distributing question in Abidar forest park

The results show that 41% of the visitors announced that the existence of water resources, and 34% stated that suitable herbal coverage are the reasons of choosing their favorite place. They introduced these two factors as effective parameters on recreation region. And also we can say that according to the low gradient in same regions and concentration of people around water resources it is essential to add in another layer of information such as water resources instead of plant thickness factor and physical factor in Makhdum model.

5.3 Effects of water resources on different levels of recreation (Upgrading the systematic analysis model)

In this survey, after providing the plan of primary recreation potentiality, water resources' layers have been considered as a positive factor so this map is contracted, and final plan will be provided .so, as it was clarified 2% (23.827 Hectare) of Abidar park has potentiality for level one concentrated recreation place, 23% (339,636 Hectare) has potentiality for level 2 concentrated recreation,31% (467,7040 Hectare) has potentiality for level 1 wide spread recreation and 44%(675,8450 Hectare) of the park surface has potentiality for level 2 wide spread recreation. By comparing both old and new map the effectiveness of water resources in the park was clear. Comparing the obtained results from the recreation potentiality map according to systematic analysis model with the final recreation potentiality map (including water resources factor) showed that some places were suitable due to slope, soil, direction and other parameters for level 2 concentrated recreations. But because of its far distance to water resources there is a lack of tourists and visitors and also frontage surveys show that some places due to slope, soil, direction and other parameters is suitable for level 1 recreation but because of having water resources visitors like to promenade there more than other places. These results indicate that water resources which provide drinkable water for visitors are one of the crucial criteria in selecting recreation places, because visitors need about 40 to 120 liters of water per day. Finally we can come to account that this water resources factor comparing to soil and direction of slope has more effects on recreation in the case study region. These results indicate that different types and levels of recreation in the case study region depend on water resources factor. And this factor with physical and natural resources is effective in determining the potentiality of recreation in Abidar Forest Park.

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Presenting the causal model of psychological variable (Computer experience, Subjective norm, Computer anxiety and Computer self efficacy) on actual use of information technology on the basis of Davis's model

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Abstract: Accepting and proper using of technology is as important as the technology and having knowledge about the influential factors on information technology enables us to predict the amount of using technological tools. One of the causes of the low rate of using technology is the lack of adequate research in this field. Based on this factor, the present study investigate the effect of psychological variables (computer experience, computer anxiety and computer self-efficacy) on the actual use of information and communication technology (ICT). The population of this study consists of virtual university students in Iran. 561 students are chosen by Krejcie and Morgan formula. After collecting data by standard questionnaires, to assess the relationship between variables, path analysis used as the statistical procedure and this is done by AMOS software. Finally, the proposed model is fitted with the data and the results show that all the variables have a meaningful and direct effect on each other except the impact of computer anxiety on the actual use which is inverted (negative).

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Keywords: technology; information; computer; software

Introduction

Technology acceptance model has been designed in North America and is used in many researches such as Shin et al (2009), Vankatesh & Davis (2000), and Tselios et al (2011), and gradually has acquired the necessary credit in other countries. A study by Legris et al (2003) indicates that technology acceptance model could predict 40% of the factors that affect the use of information technology and it is recognized as a useful theoretical model for understanding and explaining the behavior of information technology usage.

Technology Acceptance Model as a scientific model includes variables such as perceived ease of use, perceived usefulness, attitude and behavioral intention. And it could be a general model for the application of information technology in many communities (Dillon & Morris, 1996).

Yang (2007) in a research titled as "The Effect of Technology Acceptance on Undergraduate Students Usage of WEBCT as a Collaborative Tool" Showed that there is a significant relationship between perceived ease of use, perceived usefulness and computer self-efficacy with attitude and actual use of computers. But there is not a meaningful and significant relationship between subjective norm and actual use. Research results also showed that subjective norm and computer self-efficacy have direct effects on perceived ease of use. Moreover, the results of a survey by Tselios et al (2011) among university students in Greece was showed that perceived usefulness and perceived ease of use of IT systems have direct effect on attitude among students. Also in this study, the relationship between perceived ease of use and perceived usefulness reported to be meaningful. Research results of Kulviwat et al (2006), Ried (2008), and Porter et al (2006) indicates that perceived ease of use and perceived usefulness have direct and significant effect on attitude. Also Park (2007), Porter et al (2006), and Mayorga (2010) reported a significant relationship between attitudes and actual use.

Saadé and Kira (2009), in a study titled "Computer Anxiety in E-Learning: The Effect of Computer Self-Efficacy" Showed that computer self-efficacy has a direct and significant impact on students' perceived ease of use. Moreover, There is a direct relationship between computer anxiety and computer self-efficacy.

In another research by Teo et al (2007) perceived usefulness, perceived ease of use, and subjective norms are introduced as the factors which are influential on attitude. Also in this study the direct effect of subjective norm and perceived ease of use on perceived usefulness were explained.

Delice (2009) showed that computer experience has a significant and direct effect on subjective norm, computer self-efficacy and actual use. Also, there is significant relationship between subjective norm and three variables named perceived usefulness, perceived ease of use, and actual use. And finally there is a significant relationship between computer anxiety and actual use.

Sen (2005) showed that computer self-efficacy and subjective norms have direct and meaningful effect on two cognitive elements of TAM named perceived ease of use and perceived usefulness. This research also indicates that these two elements have significant effect on attitude. And also there is a significant relationship between attitudes and actual use.

Fagan et al (2004) according to social cognitive theory found that, computer experience has a direct and significant effect on computer self-efficacy. In this study computer self-efficacy has a negative relationship with computer anxiety, and a positive relationship with actual use. Also the results of this research indicate that computer experience has a positive relationship with actual use, and a negative relationship with computer anxiety. In a study by Igbaria et al (1995) titled "The Effects of Self-efficacy on Computer Usage" he showed that computer anxiety through perceived usefulness has an indirect effect on actual use. Moreover, perceived usefulness and perceived ease of use have a significant effect on actual use.In addition, the results of a research by Yusoff (2009) showed perceived ease of use and perceived usefulness have direct and significant effects on actual use.

2. Research Methodology

Research method of this study is correlation and 436 students of virtual university in Iran are selected by stratified sampling. Measurement tool in this research standardized questionnaires of perceived ease of use, perceived usefulness and attitude (Teo et al, 2007), subjective norm and computer experience (park, 2003), self-efficay (Wolters and Daugherty, 2007), and computer anxiety questionnaire (Ball, 2008), and data analysis software that is used is AMOS 18. In this study, to evaluate the reliability of questionnaires Cronbach`s Alpha is used which indicated in Table 1.

Results

Considering that the correlation matrix is the basis for analysis in casual modeling, correlation matrix of variables with correlation coefficients and their significance levels are presented in Table2.

According to correlation matrix, the most meaningful correlation is related to computer self efficacy and perceived usefulness and the least correlation is related to perceived usefulness and actual use. It should be noted that among the variables of this study, only the correlation of computer anxiety with the other variables are inversed. Direct, indirect and total effects of variables are presented in Table 3.

According to Table 2, subjective norm (β=0.113, t=2.335, P=0.01), perceived ease of use (β=0.206, t=4.224, P=0.01), perceived usefulness (β=0.238, t=4.761, P=0.01), attitude (β=0.250, t=5.129, P=0.05), computer anxiety(β= -0.214, t= -4.553, P=0.01), computer experience (β=0.256, t=5.415, P=0.01), and computer self-efficacy (β=0.206, t=4.141, P=0.01) have significant and direct effect on actual use.Subjective norm (β=0.160, t=2.965, P=0.01), perceived ease of use (β=0.191, t=3.530, P=0.01), perceived usefulness (β=0.171, t=3.061, P=0.01) and computer self efficacy (β=0.185, t=3.385, P=0.01) have significant and direct effect on attitude.perceived ease of use (β=0.158, t=2.977, P=0.01) ,subjective norm (β=0.191, t=3.635, P=0.020) and computer self efficacy (β=0.139, t=4.549, P=0.01) have significant and direct effect on perceived usefulness. Subjective norm (β=0.140, t=2.573, P=0.01) and computer self-efficacy (β=0.154, t=2.833, P=0.01) have significant and direct effect on perceived ease of use. Computer experience (β=0.115, t=2.089, P=0.037) have significant and direct effect on subjective norm. Computer experience (β=0.134, t=2.441, P=0.015) and computer anxiety (β= -0.157, t= -2.862, P=0.01) have significant and direct effect on Computer self efficacy.Computer experience (β= -0.130, t= -2.361, P=0.018) have significant and direct effect on computer anxiety.

Fitted indices (*GFI*), (*AGFI*) and (*CFI*), respectively (0.992), (0.963) and (0.986) indicate that the fitness of model is very high. The *RMSEA* value is equal to 0.034 so characteristic of reported fitness indicate that model has a good fitness with the data.

Discussion

Results showed that computer experience and computer anxiety have direct and significant effect on actual use. This result is consistent with research results of Fagan (2004) and Dlice (2009). In addition to the above mentioned researches, the relationship between computer anxiety and actual use is reported to be significant in a study by Igbaria (1995). The results also showed that there is a significant relationship between subjective norm and actual use (Dlice, 2009), and also a significant relationship between computer self-efficacy and actual use (Fagan 2004, Yang 2007). But Young (2007) in his study found that the relationship between subjective norm and actual use is not meaningful that is inconsistent with the results of this research. The study reported a significant relationship between attitudes and actual use and this finding is aliened with the research results of Mayorga 2010, Park 2007 and Porter et al 2006.In this study perceived ease of use and perceived usefulness have

significant effect on actual use and the findings of Yusoff (2009), Igbaria (1995), Yang (2007). Moreover, perceived usefulness and perceived ease of use has significant and direct effect on attitude, and this is consistent with the research results of Kulviwat et al 2006, Reid 2008, Porter et al 2006, Teo 2007, Tselios et al 2011, Yang2007, and Sen 2005. This study showed that subjective norm has a significant relationship with attitude; this is confirmed by Teo (2007) and rejected by Yang (2007).

The study results showed that attitude has a direct effect on self-efficacy and this is supported by Yang (2007). Subjective norms, computer self-efficacy, and perceived ease of use have significant effect on perceived usefulness, this finding is consistent with the result of the researches of Dlice(2009), Sen(2005), and Teo(2007).Computer self-efficacy and subjective norms have significant and direct effects on perceived ease of use. And in the researches that were done by Sen (2005), Yang (2007), and Dlice (2009), the relationship between these variables are confirmed.

It should be noted that the research results of Yusoff 2009, Kulviwat 2006, and Saadi 2009 also indicate a significant relationship between computer self-efficacy and perceived ease of use. In this study the direct effect of computer experience on computer self-efficacy and computer anxiety is determined. And it is consistent with the findings of Igbaria (1995) and Fagan (2004). In addition, the findings of Dlice (2009) indicate that there is a significant relationship between computer experience and computer self-efficacy, and also between computer experience and subjective norm. And finally the present study showed that there is a significant relationship between computer anxiety and computer self-efficacy. This result is consistent with research results Saadi 2009, and Dlice 2009.Among the research variables, computer experience has the greatest effect on the learner's usage of technology. Therefore, it is recommended that during the course of study the skillful professors with experience in technology field employed to motivate students and they encourage them to greater use of technology. In addition, holding seminars and conferences with experts, can provide an opportunity to students to gain some experiences in this field.

Table1: Reliability Coefficients of Variables

Variables	Cronbach Alpha
Subjective norm	0.76
Actual Use	0.85
perceived ease of use	0.79
perceived usefulness	0.79
Attitude	0.81
Computer anxiety	0.87
Computer experience	0.79
Computer self efficacy	0.82

Table 2: Correlation matrix of variables

Variables	1	2	3	4	5	6	7	8
Actual Use	1							
Computer experience	.252**	1						
Computer self efficacy	.206**	.114*	1					
Subjective norm	.189**	.115*	.009	1				
attitude	.248**	.052	.112*	.159**	1			
perceived ease of use	.258**	.035	.153**	.138*	.214**	1		
Computer anxiety	-.140*	-.130*	-.140*	-.012	-.122*	-.088	1	
perceived usefulness	.110*	.033	.265**	.171**	.127*	.168**	.087	1

P**<0.01 p*<0.05

Table 3: Direct, Indirect and Total Effect of Variables

Effect	Direct effect	Indirect effect	Total effect	T-Value	Explained total variance
Criterion: Actual Use	-------	-------	-------	-------	
Predictors: Subjective norm	0.113	0.113	0.224	2.335	
perceived ease of use	0.206	0.084	0.290	4.224	
perceived usefulness	0.238	0.042	0.280	4.761	
Attitude	0.250	-------	0.222	5.129	
Computer anxiety	-0.214	-0.032	-0.246	-4.553	
Computer experience	0.256	0.066	0.322	5.415	
Computer self efficacy	0.206	0.133	0.339	4.141	
Criterion: Attitude	-------	-------	-------	-------	
Predictors: Subjective norm	0.160	0.058	0.218	2.965	
perceived ease of use	0.191	0.027	0.218	3.530	
perceived usefulness	0.171	-------	0.133	3.061	
Computer self efficacy	0.185	0.069	0.254	3.385	

Criterion: perceived usefulness	-------	-------	-------	-------
Predictors: perceived ease of use	0.158	-------	0.146	2.977
Subjective norm	0.191	0.022	0.213	3.635
Computer self efficacy	0.139	0.024	0.263	4.549
Criterion: perceived ease of use	-------	-------	-------	-------
Predictors: Subjective norm	0.140	-------	0.137	2.573
Computer self efficacy	0.154	-------	0.177	2.833
Criterion: Subjective norm	-------	-------	-------	-------
Predictors :Computer experience	0.115	-------	0.115	2.089
Criterion: Computer self efficacy	-------	-------	-------	-------
Predictors :Computer experience	0.134	0.020	0.154	2.441
Computer anxiety	-0.157	-------	-0.168	-2.862
Criterion: Computer anxiety	-------	-------	-------	-------
Predictors :Computer experience	-0.130	-------	-0.129	-2.361

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Educational Policies and their Implications for Achievement of Millennium Development Goals in Sierra Leone.

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Abstract: This article examines the impact of educational policies since independence in Sierra Leone and its implications for the achievement of the Millennium Development Goals. The policy scene before the establishment of the Goals is summarized and the article shows that as a result of the lack of initiative from the international scene, this period, 1960-1990 is characterized by sterility as there was only one act promulgated on education. Since 1990, the educational landscape has been very active. These policies are reflective of the sense of the future that pervades the educational system. Recent statistics in the basic education sector brings out the achievement of the policies especially at the primary level and in girls' education The paper concludes that the emphasis on planning in the educational sector will help lead to the achievement of the Millennium Development Goals by the year 2015.
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Keywords: Education, Millennium Development Goals, Sierra Leone, policies

INTRODUCTION

Sierra Leone was founded as a haven for freed slaves from Britain, the New World and Africa in May 1787. She soon became known as the Athens of West Africa. As Kaikai (1979) notes, all accolades in education received during this period were due to the educational efforts of the missionaries and not from the activities of the Colonial Government. According to Sumner (1960) as early as 1817, English visitors to the Colony found that the total attendance at both village and town schools were 1,364 children, 833 boys and 531 girls. The visitors were impressed not only at the standard of education but also at the large number of children being educated. Through the efforts of the Christian missions, she achieved a number of firsts in education in the region. The first secondary school for boys and girls in West Africa were opened in 1845 and 1849 respectively; Fourah Bay College was started in 1827 as a training ground for teachers and catechists. In 1876, it was affiliated to Durham University and the first degrees were granted in 1879. It became the first modern university in West Africa. However, the efforts of the missionaries could not be sustained. By the time of independence in April 27th 1960, there was only a relatively few number of Sierra Leoneans that had been educated.

Post Independence Period 1960-To 1990

Education is regarded as the crucial and indispensable vehicle for the realization of individual and national needs and aspirations, (Datta 1984)). As a result of the benefits of education not only to the society, but to the individual, every modern society needs an educational policy to guide the educational process. An educational policy has been defined as the statement of intentions of the government and the envisaged means of achieving those aspects of its national objectives that have to rely on the use of education as a 'tool', Osokoya (1987). As education is not static, so a policy on education cannot be static; it must be changing with the goals, objectives and aspirations of the society, which it is meant to serve. The educational system inherited at independence was good to a certain extent. It had been designed for a colonial society. Aghenta (1993) states that the relevance of the Colonial Powers' education for independent Africa needs is questionable, because it neglected largely the country's cultural and social background. In Sierra Leone, like other former British West African colonies the efficiency of the formal educational system was called into question on several occasions because, of its lack of adequate access, and irrelevant curriculum. Bangura (1972) and Davies et al (1979) condemned the then education system that produced Africans unable to possess appropriate skills for the task of nation building. Despite calls for reform, this system of education continued to exist for over three decades.

1964 Education Act

The only shining light during this period was the first national act on education by the first post-colonial government. The 1964 Education Act was the first realistic national policy on education in Sierra Leone. It is the foundation of all subsequent acts. The policy conferred the responsibility for organization and control of education in the state in the Ministry of Education. The Act stated that the functions of the Ministry shall be the performance of all work necessary or incidental to the control of education by the Minister. The powers of the Minister included to: Establish, maintain or make grants-in-aid to schools, Provide for the regular and inspection and supervision of schools, Authorize the establishment or opening of any new school. This was the only policy that was enacted and

its primary function was to transfer ownership of education from the Colonial government to a national government.

Imperatives Reflecting on the Policy Scene.

To provide a basic education for all children is a basic human right. Ki-Zerbo (1989) state that education for all can either be a Utopian cop-out or it can be a new key to the future. Barrow (1975) states that the principle of equality has an important factor; it involves the assumptions that all people no matter their differences, whether socially or economically or otherwise are to be considered as of equal importance and that the claims of all have to be treated equally. Sierra Leone is a post conflict country. A rebel war started in 1990 by the Revolutionary United Front (RUF) in the Eastern Province of Sierra Leone engulfed the whole country by the time it ended in 2000. It brought hardship, suffering and considerable deprivation in the lives of the population. The conflict disrupted the educational process for a large number of children following massive displacement from their localities. Some of these children dropped out of school and some never went to school. It is not surprising that, a UNICEF Report (2005) states that as a result of conflicts, the challenge the world faces in order to meet the MDG of universal primary education is greater in West/Central Africa than in any other region of the world.

Educating all children including girls is a human rights issue and the obligation of all governments. It is also a moral and social imperative. At the international level, most countries of the world are signatories to international protocols and agreements binding them to protect children especially the girl child. The Universal Declaration of Human Rights and the International Covenants on Human Rights agree that everyone is entitled to all the rights and freedoms without distinction of any kind. Article 28 on the Convention on the Rights of the Child states that parties should recognize the right of the child to education and with a view to achieving this right progressively on the basis of equal opportunity, all countries shall in particular make primary education compulsory and available free to all.

It is in from the late 20th century that education for all and the education of the girl child has taken centre stage. The intersection of two key movements based on human rights: the child rights movement that gathered steady momentum in the wake of the adoption of the Convention on the Rights of the Child in 1989, and the women's movement, which culminated in the Platform for Action at the 1995 Fourth World Conference on Women in Beijing, a platform specifically addressed to the needs and rights of girls. Commitments were made at the 1990 World Summit for Children 1991 to fulfill goals for children's well-being. This was because primary school age children were still being denied their right to education, the majority of them girls. Nearly three quarters of out-of-school children were to be found in sub-Saharan Africa and South Asia. It stated, "Educate every child. Gender disparities in primary and secondary education must be eliminated," State of the World's Children (2003). They went on to recommend that the most urgent priority was to ensure access to, and improve the quality of education for girls and women, and to remove every obstacle that hampers their active participation. Sierra Leone is not only a signatory to the declarations but she is also a member of the Group of E.9 nations committed to the total eradication of illiteracy.

In May 2000, as part of the build-up towards the Special Session on Children, UNICEF, PLAN International and other leading child advocacy organizations launched the Global Movement for Children to support child rights and action on behalf of children. At its heart was the Say Yes for Children campaign, which includes 10 imperatives to make the world fit for children: Among these imperatives are: Leave no child out, Educate every child and Fight poverty: Invest in children.

Almost all the countries of the world are members of the United Nations and signatories to all these international conventions and treaties. A major imperative was education for all and gender equality and equity as basic human rights. In 2000, at the largest gathering of heads of states of the world, the United Nation Millennium Development Goals (MDGs) was agreed upon . The UN Millennium Development Goals have statements that universal primary education must be achieved and gender equality and women empowerment must be promoted. Recently, multi-lateral organizations invited the Ministers of Education and other high officials from West African countries to Ouagadougou, Burkina Faso, to reaffirm their commitment to education for all, including girls. All these ministers signed the Ouagadougou Declaration that recognizes the importance of girls' education for their countries' development, and commits governments to accelerate efforts to get as many girls as boys in school. The influence of the Conventions, Protocols and agreements on the Rights of the Child, including the girl-child during the last decades of the 20th century has been profound. This ground swell of opinion and activism for a common purpose has had a profound influence on the policy landscape of Sierra Leone. The Government of Sierra Leone in collaboration with is development partners, is implementing several policies and strategies aimed at accomplishing national and international goals.

The Period 1990-2000: The Basic Education Commission, 1994

Expanding education, especially basic formal education has been an objective of the education policies in developing countries over the past two decades (Kelly, 1987). In 1994, the he military government in Decree No. 4 established the National Commission for Basic Education. This change was influenced and necessitated by the emphasis of the decade on expanding education, especially basic formal education and giving every child a better future. As the Jomtien Conference had emphasized,

the Commission was formed to enable the country to pay more attention to the availability of basic education for all citizens by the year 2000. Among the functions of the Commission were to: Devise programmes and strategies for the accelerating of adult literacy and non-formal education. Coordinate, supervise, monitor and evaluate all programmes and interventions in the country aimed at improving the literacy rate and providing adult education for early school leavers. Support the Ministry of Education in improving the quality of education in formal educational institutions.

The New Education Policy for Sierra Leone, 1995

It was this policy that established the 6-3-3-4-system of education as the structure of education for the country. The 6-3-3-4 system of education, according to Ukeje (1991) stands out as a document containing forward looking ideas and ideals. As noted by that author, on paper, there are many innovations, which if effected will permanently change the educational landscape. The Policy stated that the major objectives for education include: The development of a broad-based education; Increased access to basic education; Improving the quality and relevance of education; Expansion and upgrading of technical/vocational education; Providing equity in education; and Developing relevant attitudes, skills and values in children.

For the first time, in policy formulation, specific statements were made to promote the education of girls. This new Policy of Education highlights a number of measures designed specifically to halt the disadvantaged status of girls in formal basic education. Specific Policy statements referring to girls' education are: a) The gradual provision of free and compulsory education for all girls at basic education level as and when the national economy picks up, Legislation specifying a minimum marriage age for girls (i.e. 18 years) and penalties for men/boys who impregnate girls before they are 18 years, The promotion of counseling and family life education as means of avoiding early pregnancy, The - re-admission of "mother-girls' into schools and Allowing unmarried female students to continue their courses at tertiary level when pregnant. This Policy is now the bedrock of all educational planning in the country. It is a major input to the efforts being made to improve and strengthen the educational sector. Indeed whatever educational systems or practices adopted in any state depends on the philosophy and objectives of education in that country or nation contained in its educational policies, World Bank Report (1986).

2000-To Date

Since 2000, there have been many acts on education. The Polytechnic Act was promulgated in 2000. This Act established five Polytechnics throughout the country. They were to serve as teaching, learning and research institutions.

Their functions further included: Providing instruction in such branches of learning as it may think fit and make provision for research and for advancement and documentation of knowledge. Grant diplomas and certificates through the National Council of Technical, Vocational and other Academic Awards Maintain faculties in Education, Engineering and Technology among others. This Act is of immense importance to Sierra Leone. Teacher training and technical and vocational education have been merged to minimize costs as well as to emphasize the importance of both in the educational scene.

The 2004 Education Act

In 2004, the Education Act was passed by Parliament. In the preamble of the Act, it is stated that it is an act designed to reform the education system. Some of the reforms made are that: Every citizen of Sierra Leone shall have the right to basic education which shall accordingly be compulsory. A parent, including a guardian who neglects to send his child to school for basic education commits an offence and shall be liable on conviction to a fine not exceeding Le500,000.00 and /or to imprisonment for a term not exceeding one year A Guidance Counsellor or teacher shall be attached to each school even at the primary level. every Chiefdom shall have at least one junior secondary school, each junior secondary school shall have its own administration, The establishment of specialist secondary schools which shall cater for subject areas such as science and mathematics, technology, the liberal arts or business studies. This Act, also known as the Basic education Act establishes basic education as the right of every right of every Sierra Leonean child and imposes punishment on parents and guardians who refuse to send their children to school. It also attempts to provide quality education by stipulating that secondary schools should have two administrations, the Junior Secondary Schools administration and the Senior Secondary School administrations.

The Government of Sierra Leone together with her international partners has succeeded in enforcing policies to enhance education for all. These include: free education for all children at the primary school level and the payment of the National Primary School Examination fees by the Government of Sierra Leone. Basic teaching and learning materials including basic core text books are also provided for most of the children. Schools have been rehabilitated or built in all the chiefdoms in the country. Table 1 brings out the status of education nationally at the end of the war. In 2000, Sierra Leone had the lowest literacy rate for the region. Moreover, girls' education was trailing woefully behind boys. As a result of international imperatives and a vibrant policy scene Sierra Leone seems poised to achieve the Millennium Development Goals of primary education for all children by the year, 2015. Findings from the Sierra Leone Multiple Indicator Cluster Survey 2005 monitors and generates valid and reliable data and information that will be used to monitor or key indicators established by the

Millennium Development Goals and the goals of A World Fit for children that include international imperatives and commitments such as the World Fit for Children and the Millennium Development Goals.

Table 1: Literacy Rates per Province

Province	Both Sexes	Male	Female
Northern	14.3%	22.7%	7.4 %
Eastern	20%	30.7%	10.4%
Southern	28.4%	38.1%	19.2%
Western Area	69%	80.2%	58.6%

Source: Ministry of Education, Science and Technology (MEST) Report, 20000

Table 2 brings out the tremendous progress that has been made in the country five years after the war. Universal access to basic education and the completion of primary education by the world's children is one of the most important goals of the Millennium Development Goals. Overall, 69 percent of children of primary school age in Sierra Leone are attending primary school. The ratio of girls to boys attending primary and secondary education is virtually at a par. There is no difference in the attendance of girls and boys to primary school. Primary school attendance in Sierra Leone has increased dramatically over the past five years and has now surged ahead of the regional norm. Educational policy as it pertains to primary education appears to be achieving success. The gender parity index shows an encouraging situation at the primary level, with equivalent attendance rates for girls and boys. Gender parity for primary education in Sierra Leone appears to be ahead of the rest of the region. The relevance of educational policies is to plan to create an educational climate that would create growth in the educational system, Sierra Leone Education Review (1976).

Table2: National Primary School Attendance Statistics

Key indicators	Estimates		West –Central Africa 1996-2004
	2000	2005	
Net primary school attendance rate (%)	69	42	55
Gender parity index, ratio of girls: boys (primary; secondary)	1.01	0.78	0.86; 0.8

Source: Multiple Indicator Cluster Survey, 2005

At the United Nations Millennium Summit in September 2000, the country became a signatory to the Millennium Declaration. The realisation of the Millennium Development Goals signals opportunities for the improvement of all Sierra Leonean. As commendable as these efforts are, Sierra Leone is still a long way from achieving universal access to quality basic education for all its children. Among all the Millenium Development Goals (MDGs) Sierra Leone stands a better chance of achieving the goal of educating every child by 2015. There are still huge gaps to be met. The recent efforts of government in the in the planning and policy formulation in the education sector show a commitment to reverse the retarded national development and socio-economic decline of the nation since independence, Millennium Development Goals Report (2005). These policies mark a new trend in the history of education in Sierra Leone. Addressing the educational needs of the country at all levels of the educational system, from basic education to higher education through policy design and formulation is the first step in the achievement of the Millennium goals in education for Sierra Leone.

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Analysis of Interaction between Home and School for Adolescent Girls: A Case of Eastern Sierra Leone

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ABSTRACT: Interaction between the home and the school is essential in the school lives of participants. Adolescent girls are facing a lot of problems both academically and personal and need all the support they can get from both the home and school environment. Primary data was collected from 8% of the population of girls at the final level of Junior Secondary School in the Eastern Province of Sierra Leone. The study reveals that both of these important channels: the home and the school are not living up to expectations. The parents are abandoning their roles as most of them do not attend the Community Teachers Association (CTA) meetings and do not even go to the schools to check on their girls' progress. The schools personnel are also failing the girls as school counsellors are not present and where they are present they have not established their relevance to the girls. The study concludes by proffering suggestions that it is the schools that have to come up with strategies to get more parents to become involved in school activities.

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Key words: home factors, school factors, girls' education, Sierra Leone

INTRODUCTION

Formal basic education, involving the first nine years in school, is now the rallying cry of educators. To provide a basic education for all children is a basic human right. Basic formal education as conceived by the Sierra Leone Education Sector Plan (2007) is aimed at equipping the child through the first nine years in schools with knowledge, skills and attitudes that will enable her to develop to her fullest capacity, derive maximum benefits from her membership of the society and fulfill her civic obligations. Basic education is seen as the most important level in the educational system, as it combines the primary level and the most important years in the secondary level. It is at this stage that the potentialities of childhood and actualities of adulthood are mediated upon. It equips its participants with the means of providing themselves with knowledge and understanding and the skills where by they can realize their ambitions. Schools have assumed the roles of preparing the young for their future adult roles and this responsibility has to be performed by teachers and guidance counselors.

Odaga and Henelved (1995) and Haq (1992) are of the opinion that school-related factors play an important role in motivating girls to enroll and stay on in schools. School based factors are viewed as driving demands to enhance girls' participation at the formal basic education level. If girls are to go to school, there must be more enhanced school related factors open to them. There must be more school places and a general commitment to compulsory, free basic education. In certain cultures, a girl's chances of going to school may be directly dependent upon the availability of separate school facilities for girls and the presence of female teachers. Also, girls' enrolment rates improve and dropout reduce significantly with the presence of female teachers in schools and the nature of the curriculum.

Lockheed and Vespoor (1990) state that: home based factors are stronger determinants on female participation in school, than the characteristics of the school. They however admit that the relationship between the home and the school is frustrating and denies any easy method of remedy. Governments, donors and educationists have tended to think in terms of school based factors, assuming that with enough schools, teachers, textbooks, the educational system will produce the desired outcomes for increased participation of students, especially girls. Tilak (1989) state that it is rightly supposed by many that since education is desirable as a social good, its benefits at the private or individual level will be obvious to parents, producing a high level of private demand for educational services. They state that the reality is that insufficient quantity and quality of educational resources limit student access to the system, constraining the educational participation of girls who stand behind boys in the queue for rational school places.

Stevens (1999) working with secondary school girls in the Southern Province of Sierra Leone revealed that there is a direct relationship between the homes pupils comes from and their achievement at

school. In this regard, whatever the teachers attempt to do, they must start with pupils whose lives have been shaped by the educational offerings of their homes. Rihani (1993) opines that discrimination against girls in the formal school system is closely related to the dichotomy of the home and the school. In African rural areas especially, the school is seen as the opening of a gap between formalized labour and informal household work. Parents, the first and foremost educators of their children, and the teachers should work together in a partnership that is both positive and cooperative. Therefore, as students learn and develop, parental and teacher involvement is crucial for their success. Johnson (2010) is convinced that the presence of guidance counsellors in the schools will help promote communication between the home and school. Special efforts are continually made to increase and improve this important link. Parents and school personnel must act as a liaison between the school and the home, providing a channel of communication between the two.

MATERIALS AND METHODS

The debate between the most important interactive forces in the lives of school children, including adolescent girls is a contentious one. This study was carried out using primary data to determine the extent to which adolescent girls' school lives are affected by their homes and schools. It was conducted in the three districts of the Eastern Province of Sierra Leone; Kenema, Kono and Kailahun. The Eastern Province is the furthest province from the capital Freetown and apart from the headquarters towns; the region is marked by its rural ness and its concentration on agriculture and mining. The principal sample group in this study was 8% of final year class of the Junior Secondary Schools (JSS 3) and this amounted to seven hundred and two girls. A null hypothesis was also advanced using the Regression analysis at the 95 % confidence level to find out whether there is a significant relationship between the support girls receive from the school and the home and their Regularity in school.

RESULTS

Table 1 and 2 shows the results of the study and stated Respondents' distribution based on school and Community Teachers Association (CTA) activities and Table 2: Determinants of Regularity in Schools by Home and School Support factors respectively.

Table 1: Respondents' distribution based on school and Community Teachers Association (CTA) activities

Variable	Frequency	Percentages
Attendance at CTA	169	24.1
Always	244	34.8
Sometimes	289	41.2
Never		
Visit to school by Parent / Guardian		
Always	27	3.7
Sometimes	127	17.7
Never	552	76.6
Discussion of school progress by Parent/Guardian		
Always	261	37.2
Sometimes	344	49.0
Never	97	13.8
Presence of Guidance counselors		
Yes	277	38.5
No	443	61.5
Private sessions with guidance counselor		
Always	17	2.4
Sometimes	63	9.0
Never	200	28.5
Non response	422	60.1
Private sessions with class teachers		
Always	126	17.9
Sometimes	177	25.2
Never	399	56.8

Table 2: Determinants of Regularity in Schools by Home and School Support factors

	B	SE	Beta	t	Sig.
(Constant)	1.547	.340		4.544	.000
Attendance at CTA	-.035	.032	-.066	-1.090	.277
Visits to School	.053	.049	.065	1.072	.285
Discussion of School Progress	.023	.041	.035	.544	.587
Presence of Guidance/Counsellor	.004	.106	.002	.038	.970
Private Sessions with G/C	-.002	.044	-.002	-.034	.973
Private Sessions with Class teachers	-.001	.035	-.002	-.029	.977
Undesirable Sexual Advances from teachers	-.116	.080	-.106	-1.454	.147
Gender of teachers liked	-.048	.053	-.056	-.916	.361

DISCUSSIONS

Table 1 show that 41.2% of the parents never attend Community Teachers' Association; 34.8% sometimes attended CTA and 24.1% always attended CTA meetings. The data from Table 1 showed that parents have to show more interest in their girls' education by participating in CTA meetings where issues regarding their education are discussed. From the analyses based on Table 1, 78.6% of the parents/guardians of the girls never visited the school; 17.7% sometimes visited the schools and 3.7% always visited the schools. The responses continued to reveal that there is need for more interest to be shown by parents/guardians in the education of their girls. To

further find out the interest parents/guardians displayed in their wards' education, Table 1 was developed. From this table, 49.0% sometimes discussed the school progress of their wards; 37.2% always discussed the school progress of the girls and 13.8% never discussed their school progress. The information depicted showed that parents need to show more interest in the school work of their children. There is need for greater links between the school and the home. In order to probe the interaction from the school on the lives of adolescent school girls, questions were asked on the presence and work of guidance counsellors. From the responses of the girls to the question of whether there is a guidance/counselor in their school, 61.5% responded negatively whilst 38.5% responded positively. The table has shown that contrary to what the Education Sector Plan (2007) states that every Junior Secondary School must have a Guidance Counsellor; the majority of the girls did not have such an important personnel in the schools that would create more links between the home and the school.

In Table 1, 28.5% never used the services of the Counsellor; 9.0% sometimes consulted the counselors and 2.4% always made use of the guidance services in their schools. The role of Guidance and Counselling Services in schools cannot be underestimated. Findings that even when they were present in the schools, the majority of the female students, never made use of them were disturbing and a cause for concern. When these girls were asked whether they had private sessions or counseling sessions with their class teachers, 56.8% said that they never had these sessions; 25.2% said sometimes and 17.9% said that they always had regular private sessions with their teachers. The majority of the female respondents did not have private sessions with their teachers. Friendly teachers contribute a lot to the adjustment and mental health of the children in school. Unfortunately, in a situation where teachers and students do not have such interaction, schools tend to be harsh and unattractive to its participants. The importance of Guidance and Counselling Services cannot be overestimated. The majority of the female respondents did not have access to Guidance Counsellors or never made use of them. It was discouraging to note that most of these girls did not have private sessions with their teachers. Tilak (1980) is strongly convinced that the absence of a warm school climate negates against girls' participation in school. The lack of friendly interaction between pupils and teachers is detrimental to the creation of a friendly and attractive school climate which helps girls, especially adolescents to make a successful adjustment between school and home problems.

In Table 2, the results of the hypothesis testing using the multiple regression analysis showed that there is a relationship between home and school variables and the dependent variable, regularity of girls in schools. The following variables were statistically significant at the 95% confidence level: attendance at CTA meetings and undesirable sexual advances by teachers. The null hypothesis was therefore rejected and the alternative hypothesis was accepted. The research suggests that both in-school factors and home factors play an important role on the school lives of adolescent girls. The home and school are the two most important parts of their lives as what happens at one usually affects the other. School girls are barometers of their environment, and when things are going well in both environments, it is easy for them to do better in school. Parents have to be very conscious of their jobs as "first and subordinate teachers." Unfortunately for most parents, even the educated ones, once their children enter secondary school, they tend to abdicate this role. But the fact is, home life encourages school success. Parents must visits schools, have a good rapport with the teachers and ensure that they make the home an environment to make their children excel academically. School counselling barely exists in secondary schools in the region being studied. These teachers lack codes which will ensure that they do not wait for these children to seek them out to bring out their relevance in creating interactions between the home and the school. These school counsellors and even the school teachers are yet to honour the African values which makes every one's problems his own.

It would be very difficult for the students to succeed without the continual and enthusiastic support of the parent. The school has the responsibility in communities where most of these parents may be illiterate or are not fully convinced of the importance of education to devote time and energy to create links between these two important groups. It is important that more efforts be made to create and maintain links between the home and the school. CTAs provide a platform for meetings during the year where parents and the school officials review and discuss a variety of topics of interest and of concern to the school family. These meetings and other social events that are there, provide a platform for the families to meet, interact and learn of all the opportunities where they can volunteer their time and expertise to the school

The schools have to make sure that programmes are instituted to help parents become more interested, involved and supportive of their daughters' participation in schools. CTA meetings have to be more interesting and Open Days should be held when parents and teachers interact in a friendly and non time conscious atmosphere. Special efforts have to be made to ensure that quality Guidance

Counselling services involving vocational, academic and personal counseling are available in the schools. Also, these teachers should be given half work load as the Policy demands so that they can work together with the girls to identify their problems and help solve these problems. These counselors must maintain regular contact with the parents of girls as well as the pupils themselves. They must also hold seminars for females as well as male teachers on the attributes of role models and the damaging effects of molestation and exploitation by teachers on the female pupils. Furthermore, an Annual Giving Fund and a yearly "Gala" to raise funds for the school can be held. These programs enable the teachers to plan many special activities with the help and cooperation of the parents to enhance the participation of girls' in schools. The government must provide the school with funds, materials, special events, and considerable expertise if they are to fulfill this mandate

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Use of Information Communication Technologies tools among Extension officers in the North- West Province, South Africa.

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Abstract: A simple random sampling technique was used to select 169 extension officers to examine the use of information communication technologies among extension officers in North West Province, South Africa. Data were collected with a structured questionnaire and analysed using frequency counts, percentages and multiple regression analysis. The results show that majority of the extension officers were male (76%) with the mean age of 44.6 years, married (79%) and 82.5% were Christians. Forty one percent of the extension officer had Diploma as their educational qualification and a mean of 16.7 years as working experience. The result revealed that extension officers indicated that they used Information Communication Technology tools to source information for various agricultural activities. From a total of the 21 uses of ICT which were listed, 15 uses of information communication technologies by extension officers were to gain access to information on the marketing of produce (1.87), obtaining new information on new technologies (1.85), on new prices of farm produce (1.81), sourcing information on new breeds of animals (1.78), on the preservation of farm produce (1.73), on viewing how to practice new techniques in livestock production and on new processing methods of farm produce respectively (1.72), on presenting seminars to farmers (1.68), obtain information on crop protection (1.66), on obtain information about new variety of crops/seeds and improving efficiency of management respectively (1.65), on project the level of production/hectare (1.64), on obtaining information on feed composition (1.62), on identifying the time of planting of crops and obtaining crop protection techniques respectively (1.61). Significant determinants of use of information communication technologies were educational qualification ($t = -2.29$, $p = .023$); importance of ICT ($t= -2.02$, $p = .046$); constraints to ICT use ($t= 8.59$, $p = .000$) and the effect of ICT on information access ($t= 4.56$, $p = .000$). The study recommends that when extension officers realize the importance of the use of ICT in extension work, the more they can access and disseminate agricultural information.

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Key words: South Africa, extension officers, information communication technologies, tools, use.

INTRODUCTION

Information and Communication Technologies (ICTs) are all technologies used for the widespread transfer and sharing of information. ICTs are rapidly consolidating global communication networks and international trade with implications for people in developing countries. ICTs in agriculture promote and distribute new and existing farming information and knowledge which is communicated within the agricultural sector since information is essential for facilitating agricultural and rural development as well as bringing about social and economic changes (Swanson and Rajalahti, 2010). The paradigms shift in development concept towards participation and sustainability coupled with revolutions in the information and communication technology has provided opportunities for extension and rural communities to move into the information age (Bhatnagar and Schware, 2000).Agricultural extension, which depends to a large extent on information exchange between and among farmers on the one hand, and a broad range of other actors on the other, has been identified as one area in which ICTs can have a particularly significant impact.

The paradigms shift in the development concept towards participation and sustainability coupled with revolutions in the information and communication technology has provided opportunities for extension and rural communities to move into the information age (Bhatnagar and Schware, 2000).However, most African countries have not devoted adequate attention to providing their citizens, including farmers, with information which can improve access to finance, land and extension advisory services and the benefits that come along with these services, especially in rural areas where 70 - 80% of the population lives. The situation is no less different in South Africa (DAFF, 2009). Agricultural extension is customarily seen as a means of transmitting knowledge to producers, which is a resource for agricultural production alongside capital, land and labour, all of which, in formal terms, help producers to extend their production activities (FAO, 2004). The effects of the introduction of Information

Communication Technology include contribution to reducing the digital divide at individual, group and community levels; and give voice to the voiceless at household, community, national, regional and global levels (Oladele, Matthew -Njoku and Adesope, 2008).

The rural poor are the engines of agricultural production in developing countries. Agricultural production and post-harvest activities account for the primary livelihood assets and strategies available to the rural poor. Any bottlenecks to improving the general livelihood of the rural poor- lack of health provision, disaster, lack of education, lack of infrastructure, lack of financial services, and many others- will have significant impacts on agricultural production at household, regional and national levels. ICT interventions that improve the general livelihoods of the rural poor may also yield significant agricultural development investments on the part of rural families (Richardson, 1997). The important role played by agricultural extension services in providing linkages and support to agricultural research information and technology transfer for farmers and farming communities has been crucial to agricultural success. Strong criticism of public agricultural extension services has circulated in recent years. This criticism is due to agricultural extension top-down approach, which has been supply- driven, technically weak, patronizing, and catering only to large farmers and providing insufficient coverage of and contacts with farmers (FAO, 2004).

South African farmers receive much advice and information from other farmers and/or private input suppliers, and many also benefit from radio and television programmes, agricultural trade magazines, shows and demonstrations. Despite the different roles and functions that agricultural extension and advisory service should play, much leaves to be desired for the use and integration of ICTs in the agricultural extension and advisory services in South Africa (DAFF, 2009). ICTs are in addition, considered to be drivers of change for rural and agricultural development as they are efficient tools for reaching rural and remote communities and for improving agricultural productivity. Due to this factor, ICTs can speed up the extension of development services in areas that include healthcare, education and agriculture. Furthermore, they can be instrumental in strengthening partnerships and in providing a framework for shared learning (Richardson, 1997).

The development and improvement of agriculture worldwide, with specific reference to the African continent and South Africa in particular, requires a paradigm shift on communication and information dissemination. Swanson and Rajalahti (2010) and Rivera and Sulaiman, (2009) posted that extension services, either general or more specialized exist in many countries to provide information, advice and educate communities relating to many facets of rural life and its improvements. IFAD (2002) reached the conclusion that extension services in Africa have failed to address the needs of small-scale farmers. In another study, Richardson (2006) argues that agricultural extension services that provide agricultural information do not work effectively in Africa. These shortfalls may be due to changes in the extension process that have resulted in the shift to the facilitation and brokerage of information, communication and advocacy services. This range of services, meant to improve rural livelihoods, can benefit from the applications of ICTs. Furthermore, the application of ICTs in agriculture is increasingly important as all stakeholders in the agricultural industry need information and knowledge about the farming phases so as to manage them effectively. The farming phases include amongst others, crop cultivation, water management, transporting of food, packaging and food processing, food quality, food management, food safety and food marketing (Stienen, 2007).

MATERIALS AND METHODS

The study was carried out in North West province, South Africa. The study population included all extension officers (200) in the province. A simple random sampling technique was used to select 169 extension officers from which data were collected. A structured questionnaire was designed based related literature and objectives of the study and comprised 21 items categorized as uses of information communication technologies. Validity of the instrument was ensured through a panel of experts in the Departments of Agricultural Economics and Extension and extension professionals from the Department of Agriculture and Rural Development, South Africa. The questionnaire had a reliability coefficient of 0.92 using the split half technique. Data were analyzed with Statistical Package for Social Sciences (SPSS) using frequencies, percentages, mean and multiple regressions.

RESULTS

Table 1 shows the personal characteristics of extension officers in North West Province, South Africa. Table 2 shows the mean and standard deviation of 21 uses of ICT tools by extension officers which were rated on a 2-point scale of Yes (2), and No (1). The result of multiple regression analysis of use of information communication technologies by extension officers were presented in Table 3.

Table 1. Personal characteristics of extension officers.

Personal characteristics	Description
Gender Predominantly	male 76%
Age Mean	= 44.6 years SD = 5.40
Marital status	79% married
Religion Predominantly Christianity	82.5%
Educational level Predominantly diploma	41% , BSc =15%
Household size Mean	= 4.8 persons SD = 1.20
Working experience Mean	= of 16.7 years SD = 4.50
Living in job location Predominantly	Yes 79%, , No 21%
Job designation Predominantly	extension officer 53%,Senior/Chief agricultural technicians 36%

Table 2. Use of ICT by Extension Officers in the Northwest Province

Use	Yes	No	Mean	SD
Gain access to information on marketing of produce.	155 (91.7)	42 (24.9)	1.87	.43
Obtain information on a new technology.	154 (91.1)	15 (8.9)	1.85	.47
Obtain information on new prices of farm produce.	147 (87.0)	22 (13.0)	1.81	.52
Obtain information on new breeds of animals	143 (84.6)	26 (15.4)	1.78	.53
View how to practice new techniques in livestock production.	140 (82.8)	29 (17.2)	1.72	.63
Obtain information on the preservation of farm produce.	139 (82.2)	30 (17.8)	1.73	.600
Obtain information on new processing methods of farm produce.	134 (79.3)	35 (20.7)	1.72	.58
Obtain information on crop protection.	131 (77.5)	38 (22.4)	1.66	.67
Present seminars to farmers.	131 (77.5)	36 (22.5)	1.68	.63
Obtain information about new variety of crops/seeds.	130 (76.9)	39 (23.0)	1.65	.68
Project the level of production/hectare.	128 (75.7)	41 (24.2)	1.64	.67
Improve efficiency of management.	127 (75.1)	42 (24.9)	1.65	.64
Obtain information on feed composition.	126 (74.6)	43 (25.4)	1.62	.68
Identify the time of planting of crops.	126 (74.6)	43 (25.4)	1.61	.70
Obtain information on new processing technique.	125 (74.0)	44 (26.0)	1.61	.69
View new propagation methods of crops.	117 (69.2)	52 (30.8)	1.55	.73
Call the attention of the extension agent.	115 (68.0)	54 (32.0)	1.53	.73
Feed formulation.	115 (68.0)	54 (32.0)	1.53	.73
Receive timely instruction from extension agent on cultural practices.	113 (66.9)	56 (33.1)	1.54	.70
For fertilizer calculations	109 (64.5)	60 (35.5)	1.50	.73
Learn how to carry out budding, grafting, layering etc.	102 (60.4)	67 (39.7)	1.43	.762

Table 3. Determinants on the use of ICT tools by extension officers.

	B	Std. Error	Beta	t	Sig.
(Constant)	7.774	4.985			
Gender	-1.470	1.277	-.074	-1.152	.251
Age	.055	.086	.057	.635	.526
Marital Status	-.321	.421	-.049	-.763	.447
Number of children	-.265	.462	-.042	-.573	.567
Religion	-.548	.731	-.043	-.750	.454
Highest qualification	-.738	.321	-.128	-2.297	.023
Studying for a higher degree	1.247	.972	.071	1.283	.201
Household size	.031	.255	.007	.120	.905
Working experience	.035	.068	.043	.511	.610
Living in job location	1.131	1.216	.052	.930	.354
Place of residence	.319	.887	.020	.360	.720
Number of farmers covered	-8.436E-5	.001	-.006	-.106	.915
Distance to farmers	.001	.001	.033	.578	.564
Awareness of ICT	-.072	.045	-.174	-1.616	.108
Availability of ICT	-.045	.071	-.099	-.641	.522
Accessibility to ICT	-.024	.086	-.053	-.277	.782
Competence on ICT use	.058	.069	.142	.842	.401
Importance of ICT	.096	.048	.246	2.016	.046
Constraints to ICT use	.903	.105	.547	8.595	.000
Effect on information access	.148	.032	.280	4.566	.000
Officers e -readiness	.099	.129	.050	.769	.443
F	10.005				
P	.000				
R	.767				
R squared	.588				
Adjusted R squared	.530				

DISCUSSION

From Table 1, majority of the extension officers were male (76%) with the mean age of 44.6 years, married (79%) and 82.5% were Christians. Forty one percent of the extension officers had a diploma as their educational qualification and a mean of 16.7 years as working experience. There was a mean of 4.8 persons per household and 79% live in their job location, rural or peri urban notwithstanding. In terms of job designation 53% were extension officers. Bembridge, (1991) also reported similar findings in terms of the personal characteristics of extension officers in South Africa. Table 2 shows that from a total of the 21 uses of ICT which were listed, 15 prominent uses of information communication technologies by extension officers were to gain access to information on the marketing of produce (1.87), obtaining new information on new technologies (1.85), on new prices of farm produce (1.81), sourcing information on new breeds of animals (1.78), on the preservation of farm produce (1.73), on viewing how to practice new techniques in livestock production and on new processing methods of farm produce respectively (1.72), on presenting seminars to farmers (1.68), obtain information on crop protection (1.66), on obtain information about new variety of crops/seeds and improving efficiency of management respectively (1.65), on project the level of production/hectare (1.64), on obtaining information on feed composition (1.62), on identifying the time of planting of crops and obtaining crop protection techniques respectively (1.61). Similar findings by Alao (2010) indicated that the impact of ICTs on agricultural development can enhance the integration and efficiency of agricultural systems by opening new communication pathways and reducing transaction costs, gives greater accessibility of information on prices, market survey, farming techniques, farm product and farm outlets. This supports the argument that ICTs can be of vital importance in providing information on relevant agricultural needs of farmers and extension officers. Similarly this observation is corroborated by Lynch (2001) when stating that positive attitude and knowledge and skills of extension experts directly impact the application of ICTs. Aboh's (2008) results showed that 59.60% of the respondents in Imo State, Nigeria used ICT in executing their jobs while 40.40% of the respondents did not use ICT in executing their job. This implies that the number of extension agents who used ICT in their extension services were relatively predominant. This may be due to benefits of using ICT in extension services which the extension agents have observed.

In Table 3, the independent variables were significantly related to use of ICT with the F-value of 10.005, $p < 0.05$ showed that there was a strong correlation between independent variables and use of information communication tools. The result further predicted a 58.8% of the variation on the use of ICT by extension officers. Significant determinants were educational qualification ($t = -2.29$, $p = .023$); importance of ICT ($t = -2.02$, $p = .046$); constraints to ICT use ($t = 8.59$, $p = .000$) and the effect of ICT on information access ($t = 4.56$, $p = .000$). It implies that technologies needed are more on the intensity of need. This suggests that as the educational qualification gets higher, there may not be a need to more than what extension officers already have concerning Information Technology because they may have acquired more before attaining that level over the years. On the contrary, Salau and Saingbe (2008) indicated that in Nasarawa State, Nigeria educational level has a positive relationship with the use of ICT and that the higher the level of education the higher the level of ICT utilization and vice versa.

The study showed that the uses of information communication tools by extension officers in North West Province, South Africa were to gain access to information on the marketing of produce (1.87), obtaining new information on new technologies (1.85), on new prices of farm produce (1.81), sourcing information on new breeds of animals (1.78), on the preservation of farm produce (1.73), on viewing how to practice new techniques in livestock production and on new processing methods of farm produce respectively (1.72), on presenting seminars to farmers (1.68), obtain information on crop protection (1.66), on obtain information about new variety of crops/seeds and improving efficiency of management respectively (1.65), on project the level of production/hectare (1.64), on obtaining information on feed composition (1.62), on identifying the time of planting of crops and obtaining crop protection techniques respectively (1.61). Significant determinants of use of information communication tools by extension officers were educational qualification, importance of ICT, constraints to ICT use and the effect of ICT on information access. The use of information communication technologies

highlighted will help extension officers to harness information in improving rural livelihoods.

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Left ventricular hypertrophy and plasma Nitric oxide in hemodialysis patients

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Abstract: Background: Development of Left ventricular hypertrophy (LVH) in hemodialysis (HD) patients is reported in different clinical studies. The mechanisms responsible for LVH in these patients are complex and multi-factorial. Experimental studies have shown that Nitric oxide (NO) is a possible anti-hypertrophic molecule. The aim of this study was to assess prevalence of LVH and its pattern in these patients and plasma NO in these patients. **Methods:** Twenty six HD patients participated in the study. Measurement of plasma NO, and trans-thoracic echocardiographic assessment of left ventricular mass index (LVMI) and relative wall thickness (RWT) were done. LVH was diagnosed in men with LVMI>115g/m^2 and women with LVMI>95g/m^2. LVH was concentric when RWT>0.42 and eccentric when RWT<0.42. **Results:** Twenty one out of twenty six (80.8%) HD patients suffered of LVH with a mean LVMI of 191+/-78.14g/m^2. 73% of them suffered of concentric LVH, while only 7.8% of them suffered of eccentric LVH and only one patient had normal left ventricle geometry. Mean plasma NO of HD patients was significantly less than mean plasma level of healthy control subjects (6.46±1.0 microgram/dl vs 11.18±1.22 microgram/dl) and LVMI showed a significant negative correlation to plasma NO. **Conclusion:** Nearly 80% of our studied HD patients suffer of LVH , most of them suffer of concentric LVH. Mean plasma NO was significantly lower in HD patients compared to healthy control subjects. Plasma NO level was significantly negatively correlated with LVMI. Possible role of NO in the development of LVH in HD patients requires further study.
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1. Introduction

Excess mortality rates due to cardiovascular disease in chronic kidney disease (CKD) and end-stage renal disease (ESRD) patients had been described in epidemiological and clinical studies. It was thought that this is due to coronary artery calcification but recently attention was shifted to left ventricular hypertrophy (LVH) and fibrosis which can result in congestive heart failure (CHF) and sudden cardiac death in these patients.[1]

The development and persistence of LVH is associated with increased mortality risk.[2] ,[3] The mechanisms responsible for LVH in ESRD patients on regular hemodialyis (HD) are complex and multi-factorial. After load related factors include rise in systolic blood pressure, stiffening of the great vessels due to calcification and cross linking[4], elevation of the serum sodium concentration from hypertonic solution cause stiffening of microcirculation and reduced release of nitric oxide(NO).[5] Preload related factors including volume overload due to increase in intravascular and extracellular volume as well as hyperdynamic circulation produced by arteriovenous (A-V) fistula had been suggested. Factors not related to preload or afterload include, vitamin D deficiency, hyperphosphatemia and hyperparathyroidism, angiotensin dependent pathway, and mammalian target of rapamycin (mTOR) pathway not related to blood pressure changes have been suggested.[6]

Studies suggested that NO is a possible antihyertrophic molecule. Experimental studies have shown that nNOS or eNOS deficient mice suffer of LVH and that those animals with deficiency of both nNOS and eNOS suffer of more severe LVH. That points out to the fact that NO is a possible anti-hypertrophic molecule. [7] Thus the aim of the current study was to assess the prevalence of LVH and its pattern among HD patients using trans- thoracic echocardiography and to determine plasma NO levels in these patients.

2. Subjects and Methods:

The protocol of this study was approved by the scientific board of Nephrology division - Internal Medicine department and Committee of Research Ethics; Faculty of Medicine – Cairo University – Egypt and informed consents were obtained from all participants.

In this cross sectional study twenty six ESRD patients, undergoing regular HD via an A-V fistula three times per week in 4-hourly sessions were included in the current study. All patients were attendants of dialysis units of Kasr El-Eini hospital –

Cairo University during the period from January 2011 to October 2011. Patients with history of cardiovascular disease and those suffering of more than mild mitral or aortic valve disease were excluded.

All participants were subjected to the thorough clinical evaluation. Data regarding age, gender, body mass index, etiology of renal failure, and duration of hemodialysis were recorded. Blood sampling for assessment of blood urea, serum creatinine, calcium, phosphorus, and blood hematochrite using Hitachi 917 –Auto analyzer (Roch Diagnostics –Germany) was done.

NO metabolites (NO_2 and NO_3) in plasma of the patients were determined before the dialysis procedure with the Griess method using a Parameter™ assay commercial kit. This kit is a colorimetric assay applying nitrate reductase, which converts nitrate to nitrite, and total nitrite was measured at 540nm absorbance by reaction with Griess reagent (sulfanilamide and naphthalene ethylene diamine dihydrochloride). Amounts of nitrite in the plasma were estimated by a standard curve obtained from enzymatic conversion of $NaNO_3$ to nitrite. [8] Blood samples from healthy control subjects were obtained to assess basal NO metabolites level. Mean plasma level of serum NO measured using the same method among 30 age and gender matched healthy control subjects was 11.18±1.22ug/dl.

Two-dimensional and M-mode echocardiography were performed to all included subjects, as soon as possible following hemodialysis session. Imaging was performed with Vivid 3N (General electric) equipped with 2.5 MHz and 3.5 MHz phased pulsed array transducers. Cardiac dimensions were measured according to the guidelines of the American Society of Echocardiography using M-mode method.[9] LV mass, LV mass index, relative wall thickness (RWT) and mean wall thickness were measured using the following equations(ASE-cube formula):[10]

$$\text{LV Mass (g)} = 0.8\{1.04[([\text{LVEDD} + \text{IVSd} + \text{PWd}]^3 - \text{LVEDD}^3)]\} + 0.6$$

$$\text{LV mass index(g/m2)} = \text{LV mass/Body surface area}$$

$$\text{RWT} = \frac{2 \times \text{PWd}}{\text{LVEDD}}$$

LVEDD (mm): left ventricular end diastolic diameter, IVSD (mm): interventricular septum thickness at end of diastole, and PWD (mm): posterior wall thickness in diastole.

Women with LV mass index >95 g/m^2 and men with LV mass index >115g/m^2 suffered of LVH. LVH was considered concentric when RWT >0.42 and eccentric when RWT is <0.42.[11]

Statistical Analysis

Categorical data were summarized in the form of frequencies and percentage. Numerical data were summarized in the form of mean ± standard deviation (SD). Strength of association between variables was tested using Pearson correlation coefficient. Comparison of quantitative variables between the study groups was done using Mann Whitney U test. $P<0.05$ was considered significant. Data management and analysis were performed using Statistical Analysis Systems (Microsoft Excel 2007 (Microsoft Corporation, NY, USA) and statistical package of social sciences (SPSS) version 13.

3. Results:

The clinical data of the studied group showed that the predominant causes of ESRD were mainly hypertension and unknown causes. One half of patients suffered of systemic hypertension or received antihypertensive medications in this study. Nearly one third of the patients are receiving beta blocker therapy (Table 1).

The laboratory data of the studied patients showed that they had high blood urea, creatinine and phosphorus levels in addition to low calcium blood levels and hematochrite percentage. Mean plasma NO among HD patients was lower than mean plasma NO among healthy control subjects reported above (Table 2). The echocardiographic data of the studied group showed that they suffer of increased interventricular septum thickness , left ventricle posterior wall thickness and LVMI (Table 3).

The echocardigraphic evaluation of the LV structure of the studied patients. revealed that 73% of them suffer of concentric LV hypertrophy, 15.4% suffer of concentric remodeling of LV, 7.8% suffer of eccentric LV hypertrophy and only 3.8% have normal LV structure (Table 4). LVMI of hypertensive patients or those receiving anti-hypertensive medication (LVMI HTN) and non hypertensive patients(LVMI nonHTN) were 206.36±69.66 g/m^2 vs 173.16±82.88g/m^2 respectively. That difference was not statistically significant (*P* value=0.21) (Figure 1).

The mean NO plasma level among HD patients was significantly lower than mean NO plasma level of healthy control subjects(6.46± 1.06 ug/dl vs 11.18±1.22ug/dl). Pearson correlation between LVMI and plasma NO showed a significant negative correlation between plasma NO and LVMI (Figure 2).

4. Discussion:

The current study results showed that 80.8% patients on regular HD for 75.23±72.17 months suffered of LVH with a mean LVMI of 191+/-78.14g/m^2. 73% of patients suffer of concentric LV hypertrophy, 15.4% suffer of concentric remodeling of LV, 7.8% suffer of eccentric LV hypertrophy and only 3.8% have normal LV structure. Mean LVMI of hypertensive patients or those receiving antihypertensive medications was not statistically

different from that of normotensive patients. Mean plasma NO of HD patients was significantly lower than that of healthy control subjects and LVMI showed a significant negative correlation between plasma NO and LVMI.

Table 1.Clinical data of included subjects of the studied group

Parameter	Value
• Age (years)	42.8±12.95
• Gender	
Males	16/26(61.5%)
Females	10/26(38.5%)
BMI (kg/m^2)	24.6±5.6
• Etiology of renal failure	
Hypertension	7/26(26.9%)
Diabetes and hypertension	3/26(11.5%)
Obstructive uropathy	3/26(11.5%)
Glomerulonephritis	2/26(7.7%)
Pyelonephritis	1/26(3.84%)
Congenital	1/26(3.84%)
Polycystic kidney	1/26(3.84%
Unknown	8/26 (30.7%)
• Dialysis duration (months)	75.23±72.17
• Co-morbidities	
Hypertension	14/26(53.85%)
Diabetes	3/26(11.5%)
Antihypertensive medications:	
• Angiotensin Converting enzyme inhibitors	1/26(3.84%)
• Beta blockers	9/26(34.6%)

Data are expressed as mean ±SD or n/n(%)

Table 2. Laboratory data of included subjects of studied group

Parameter	Value
Serum Creatinine (mg/dl)	8.12±1.49
Blood urea (mg/dl)	92.5±16.85
Serum Calcium (mg/dl)	8.65±0.82
Serum Phosphorus (mg/dl)	4.29±0.89
Calcium phosphorus product	36.5±5.44
Haematocrite(%)	34.96±3.97
Serum Nitric oxide (ug/dl)	6.46±1.1

Data are expressed as mean ±SD

Table 3.Echocardiographic data of the studied group

Parameter	Value
Left ventricle end -diastolic diameter (mm)	5.2±0.86
Left ventricle end -systolic diameter (mm)	3.26± 0.6
Inter ventricular septum thickness (mm)	1.41±0.31
Left ventricle posterior wall thickness(mm)	1.47±0.25
Relative wall thickness (mm)	0.59±0.13
Left ventricle mass(grams)	334.88±151
Left ventricle mass index (gram /m^2)	191±78.14

Data are expressed as mean ±SD

Table 4. Echocardiographic evaluation of left ventricle structure of the studied group

Parameter	Value
Normal Left ventricle	1/26(3.8 %)
Concentric left ventricle remodeling	4/26(15.4%)
Concentric Left ventricular hypertrophy	19/26(73 %)
Eccentric Left ventricular hypertrophy	2/26(7.8%)

Data are expressed as n/n(%)

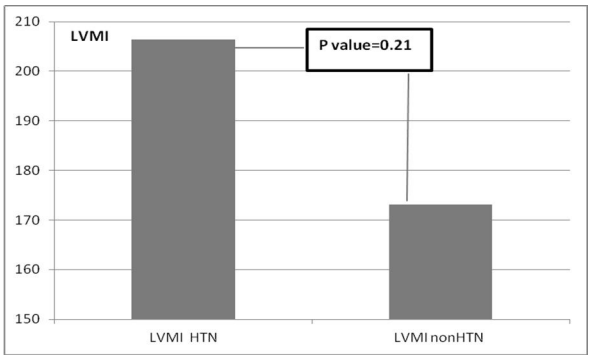

Figure 1) Comparison between left ventricle mass index in hypertensive patients(LVMI HTN) and left ventricle mass index in non hypertensive patients (LVMI nonHTN). *P* value <0.05 is considered to be significant.

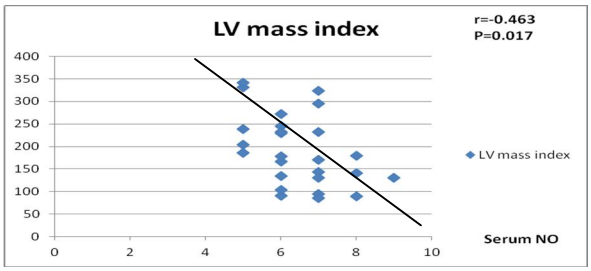

Fig 2. Person correlation between left ventricle(LV) mass index and serum Nitric oxide(NO).

Different studies reported that 68-78% of HD patients suffer of LVH. [12,13,14] The previously reported percentages are close to what we noticed in the current study. LVH pattern can be concentric or eccentric, depending upon complex intermingling of volume overload, pressure overload , and non hemodynamic factors in HD patients are responsible for the development of LVH. [15]

Zoccalli *et al.,* reported that 38% of HD patients suffer of eccentric LVH while 36% of them suffer of concentric LVH. [16] while Mannes *et al.,* studied the geometric pattern of the left ventricle among 26 HD patients, reported that eccentric LVH affected 55% of the patients and only 16% of them suffer of concentric LVH.[17]

The previously mentioned studies which suggested either equal role of volume and pressure

overload related factors or a predominant role of volume overload related factors in HD patients, while the current study showed that after load related factors appear to be more predominant, which might be due to the fact that half of patients in the current study suffer of systemic hypertension.

There was no statistically significant difference between LVMI of hypertensive HD patients and LVMI of non hypertensive HD patients in this study , which suggests that factors other than hypertension plays a role in development of LV hypertrophy. So we tried to assess plasma NO (anti-hypertrophic molecule) level in these patients. NO is released from the amino acid L-Arginine via endothelial NO synthase enzyme (eNOS),neuronal NO synthase enzyme (nNOS) and inducible NO synthases (iNOS) . All the three types of NO synthases are present in the heart.[18]

NO intracellular target is guanylate cyclase that converts guanosine triphosphate (GTP) into cyclic guanylate monophosphate (cGMP). cGMP acts via protein kinase G inhibiting a variety of pro-hypertrophic pathways including that which involve Angiotensin II , Endothelin 1, insulin, growth factors , and mitogen activated protein kinase.[19]NO in addition has a dose dependant pro-apoptotic role , high concentration of NO is needed for activation of caspases,DNA fragmentation and apoptosis.[20]

Renal failure is a state of NO deficiency. Total NO production is reduced in CKD and ESRD patients which agrees with results of the current study . NO is reduced through a variety of mechanisms in these patients, which include reduced L-Arginine, endogenous NOS inhibitors, defective renal NO production and endothelial dysfunction.[21]

As reported above, there is a significant negative correlation between LVMI of HD patients and their serum NO; these results suggest that reduced serum NO in HD patients might play a role in the development of LVH in these patients. Zocalli *et al.,* reported in a pioneer study that there was a significant correlation between serum asymmetric dimethyl arginine (ADMA) (an endogenous inhibitor of NO synthase enzyme) and LVMI in HD patients. That study was the first point to a possible role of reduced serum NO in the development of LVH in HD patients.[16]

Rasic *et al.,* reported a significant positive correlation between serum NO and LVMI in HD patients and that it is an important determinant of LV diastolic function in these patients.[22] Moreover Li and Wang reported that sustained release isosorbide mononitrate therapy in maintenance HD patients resulted in significant reduction in LVMI that appeared after 24 weeks of nitrate therapy. Their study showed that NO donors can reduce LVMI in HD patients which again supports the role of reduced serum NO in the development of LVH in these patients.[23]

Only few articles regarding the possible role of NO in the development of LVH in HD patients appeared in English literature which makes the data of the study valuable but the study got few limitations. First Cardiac magnetic resonance imaging (MRI) using gadolinium is the gold standard for assessment of LV mass, but gadolinium cannot be used in renal failure patients due to the risk of nephrogenic systemic fibrosis.[24] That was the reason for using TTE in the current study which appears to be a reasonable alternative to MRI, despite the fact that asymmetry of the LV geometry might result in errors so the results must be interpreted with caution.[25] Second although the current study showed a positive correlation between plasma NO and LVMI in HD patients , it can not prove a causal relationship due to the nature of the study.

In conclusion, LVH is a common under-recognized problem in HD patients with its consequent increase in cardiovascular mortality. Plasma NO levels correlated with echocardiographicaly determined LVMI in these patients. Study of the exact role of NO as anti-hypertrophic molecule is needed to know whether reduced NO plays actually a role in increased LVMI in these patients or it is just an innocent bystander. In the near future NO donors might play a role in prevention and treatment of that serious problem among HD patients.

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Spatial Assessment of Multidimensional Poverty in Rural Nigeria

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Abstract: Poverty is not only an economic development challenge in Nigeria but an unacceptable violation of people's fundamental rights. Several studies had proposed the desirability of multidimensional poverty measurement over the unidimensional approach in order to have a broader overview of the distribution of welfare. This study therefore assessed the spatial distribution of multidimensional poverty focusing on the Nigerian states. The data were the Core Welfare Indicator Questionnaire (CWIQ) that were collected in 2006 using well-structured questionnaires from 59567 rural households. Descriptive statistics and fuzzy set decomposition approaches were used for data analysis. Results show that many of the states in the northern part of the country had the highest percentage of those with no education. Average multidimensional fuzzy poverty index was 0.3796. Also, housing/sanitation and economic condition/security are the main factor that contributed to poverty across the states. It was concluded that in order to implement socio-economic policies to reduced poverty diffusion, economic reforms should be directed towards education, improving housing/sanitation and economic/security conditions.
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1. Introduction

The evolution of the meaning and measurement of poverty has been closely entwined with the evolution of development economics and its relationship with development studies (Sumner, 2004). No doubt, poverty means different things to different people. Some people will define poverty as the absence of a car or fridge, while for others it will be the lack of formal education, housing or employment. If one were to consult the Oxford English dictionary (1989), one would find six definitions of poverty. Poverty, and being poor, are described by expressions such as "deficiency in", "lacking of", "scantiness", "inferiority", "want of", "leanness or feebleness", and many more. Experiences of poverty differ from person to person, from one area to another, and across time.

The original meaning of poverty implies deprivation of something that is essential or desired. The concept of poverty varies depending on the recognized values. In one extreme, it is found that the most absolute forms of poverty are starvation or death from lack of shelter. On the other side, poverty extends continuously towards a fuzzy limit. It also varies with the wealth of societies as well as with the passage of time (Baran et al 1999). Poverty appears as a multidimensional phenomenon, closely associated with the concept of exclusion. The poverty state is then, rather a continuum than a classical set or point on a scale of absolute values. It is defined with respect to a variety of quantitative and qualitative criteria that may change with societies and cultures. Poverty notion involves, above all, a comparative concept that refers to a relative quality. That is why there is no consensus on an absolute definition of poverty, even though attempts have been made by many including Valentine 1992.

When talking about poverty it is important to note that with material deprivation, there are other kinds of deprivation(s) in variable combinations, from one society to another. At present, it is admitted that poor people are underprivileged in several other important fields such as education, occupation and political ones, among others (Valentine 1992).

Amaghionyeodiwe and Osinubi (2004) submitted that poverty is not only a term that is commonly used by the generality of the people but also one that has no specialized content as a concept. Besides, it is a multi-dimensional socioeconomic and cultural situation that transcends economic description and analysis. In addition, poverty is both concrete and relative. For any particular society, poverty and the poor are very concrete phenomena and can be easily identified. Yet it is also relative: the population that may be classified as poor in a developed economy would be regarded as materially well off in least developed countries.

Perceptions of poverty have not only evolved historically, but also vary tremendously from culture to culture. The criteria for distinguishing the poor from the non-poor tend to reflect national normative concepts and priorities. As countries

become wealthier, their perceptions of acceptable deprivations change. Being multidimensional, poverty takes different forms or typologies of which three broad ones can identified as follows: physiological deprivation, social deprivation and human freedom deprivation.

Poverty line is very important in understanding the living condition of the poor and has great impact on policy decisions. There is no consensus in the definition of poverty line. Sen (1983) points out an irreducible core in the idea of poverty that is absolute. However, some people may be much less deprived with a given amount of attributes while some others are much more deprived, this justifies relative poverty line. In multidimensional approach, poverty line is established for each attribute and these are determined independently of the distribution. It has been argued that absolute poverty line is more viable in multidimensional analysis, because relative poverty line becomes essentially ambiguous in some dimensions. However, a multidimensional approach opens the possibility to express attributes in a relative or absolute way depending on the nature of good under consideration.

The issue of poverty in many developing countries is a very crucial one going by its intensity, incidence and severity. In Nigeria, poverty analyses had been extensively done with the food energy intake (FEI) and cost of basic needs (CBN) approaches (Aigbokhan, 2000). However, it had been observed that poverty in Nigeria has both income and non-income dimensions. Specifically, the poor are those who are unable to obtain adequate income, find stable jobs, lack adequate level of education, unable to satisfy their basic health needs, have no or limited access to food, clothing, decent shelter, have few economic assets, and sometimes lack self-esteem (Aluko, 1975; World Bank, 1995; Olayemi, 1995; Sancho, 1996).

Ayoola *et al* (2000) used focused group discussions to determine households' perception of poverty and wealth in some Nigerian rural and urban areas. It was found that in urban areas, the rich were perceived to have money and live in beautiful, cemented houses with boreholes or tap water. They eat good food, wear good clothes, have access to medical services and are healthy. Similar views were held for rural areas. Also, the rich were described as people with opportunities, both for themselves and their children. The urban rich achieve a good quality of life by having successful businesses and owning land and property. They are able to educate their children in private institution, who then in turn become successful. In rural areas, being rich could be described in terms of ownership of land and productive capital inputs such as fertilizer, and access to markets.

Most of the works done on poverty in Nigeria have looked at the various welfare indicators such as access to water, healthcare facilities, housing etc (Ayoola *et al*, 2000; NPC and ORC Macro, 2004). But not much has been done in computing multidimensional poverty index from these indicators. Also, there have not been many studies on poverty response along side with multidimensional indicators of welfare and some implemented development programs. This study therefore seeks to determine those welfare variables that significantly influence poverty status of the household. Also, it looks at the effects of households' welfare on poverty reduction interventions. This study adopts the methodology developed by Dagum and Costa (2004), supplemented with the decomposition methods of Mussard and Pi Alperin (2005) which is an alternative for measuring poverty in Guinea for the years 2002-2003.

In the past few decades, the measurement and assessment of poverty has been one of the top priorities in international discussions. This is necessary in order to generate relevant and accurate for a timely analysis of the nature and causes of persistent poverty for policy implementation (Barrett, 2004). This paper therefore applies the fuzzy set approach to provide a spatial multidimensional poverty profile for Nigeria. In the remaining part of the paper, the methodology, results and discussions and conclusions have been provided.

2. Materials and Methods

Nigeria is one of the Sub-Sahara African (SSA) nations located in the western part of Africa and borders Niger in the north, Chad in the northeast, Cameroon in the east, and Benin in the west. To the south, Nigeria is bordered by approximately 800 kilometres of the Atlantic Ocean, stretching from Badagry in the west to the Rio del Rey in the east. It lies between 4º16' and 13º53' north latitude and between 2º40' and 14º41' east longitude.

Nigeria is made up of 36 states and a Federal Capital Territory (FCT), which are grouped into six geopolitical zones (North-Central, North-East, North-West, South-East, South-South, and South-West) as shown in figure 4.1. There are also 774 constitutionally recognized Local government Areas (LGAs) in the country. Within the boundaries of Nigeria are many social groups with distinct cultural traits, which are reflected in the diverse behaviour of the people. There are about 374 identifiable ethnic groups, but the Ibo, Hausa, and Yoruba are the major groups.

The data and Sampling procedures

The study used data collected during the 2006 National Core Welfare Indicator Questionnaire (CWIQ) Survey by the National Bureau of Statistics (NBS) 2006. According to NBS (2006), atwo-stage cluster sample design was adopted in each LGA. The first stage involves the Enumeration Areas (EAs), while Housing Units (HUs) constitute the 2nd stage. The National Population Commission (NPopC) EAs as demarcated during the 1991 Population Census served as the sampling frame for the selection of 1st stage sample units. In each LGA, a systematic selection of 10 EAs was made. Prior to the second stage selection, complete listing of Housing Units (and of Households within Housing Units) was carried out in each of the selected 1st stage units. These lists provided the frames for the second stage selection. Ten (10) HUs were then systematically selected per EA and all households in the selected HUs were interviewed. The projected sample size was 100 HUs at the LGA level. The sample size using other defined reporting domains (FC, senatorial, state and geo-political zone) varied, depending on the number of the LGAs that made the reporting domain. Overall, 77,400 HUs were drawn at the national level out of which 59567 were from the rural areas. Also, sampling weights were constructed for each sample, thus making the data representative of the entire population in Nigeria.

Analytical Techniques

Descriptive analysis

The descriptive statistics that were used for this study include frequency distribution, histogram and measure of central tendency and dispersion. The measure of central tendency and dispersion used include mean, standard deviation and coefficient of variation.

Analyses of Variance (ANOVA)

The ANOVA method was used to test for significant differences in the group means of multidimensional poverty ratios computed across some socio-economic and regional variables (hypothesis 1). This was done by computing the F-ratio, which measures the ratio of systematic variations to unsystematic variations. The homogeneity test of variance test was done using the Levene's test. When this was broken, the computed F-ratios based on the Brown-Forsythe (1974) and the Welch (1951) approaches were used (Field, 2005).

Computation of Multidimensional Poverty Indices

Indices of multidimensional poverty were computed using the Fuzzy Set theory originally developed by Zadeh (1965). Zadeh (1965) characterized a fuzzy set as a class with a continuum of grades of membership. Therefore, in a population A of n households [A = a_1, a_2, a_3, ……a_n], the subset of poor households B includes any household $a_i \in B$. These households present some degree of poverty in some of the m poverty attributes (X).

The multidimensional poverty ratio of a household, $\mu_B(a_i)$, which shows the level of welfare deprivation and membership to set B is defined as the weighted average of x_{ij},

$$\mu_B(a_i) = \sum_{j=1}^{m} x_{ij} w_j / \sum_{j=1}^{m} w_j \qquad 1$$

w_i is the weight attached to the j-th attribute.

The intensity of deprivation with respect to X_j is measured by the weight w_j. It is an inverse function of the degree of deprivation and the smaller the number of households and the amount of their deprivation, the greater the weight. In practice, a weight that fulfils the above property had been proposed by Cerioli and Zani (1990). This can be expressed as:

$$w_j = \log[\sum_{i=1}^{n} g(a_i) / \sum_{i=1}^{n} x_{ij} g(a_i)] \geq 0 \qquad 2$$

Ideally, $g(a_i)/\sum_{i=1}^{n} g(a_i) > 0$ and $g(a_i)/\sum_{i=1}^{n} g(a_i)$ is the relative frequency represented by the sample observation a_i in the total population. Therefore when $x_{ij}=0$, the welfare attribute should be removed.

Sub-group decomposition

From (4.2), the dimension that tends to increase the level of poverty of each household can be determined by decomposing the household poverty index:

$$\mu_B(a_i) = \sum_{j=1}^{n} y_{ij} \qquad 3$$

where y_{ij} is the contribution of the j-th attribute to the overall amount of the household poverty index $\mu_B(a_i)$:

$$y_{ij} = x_{ij} w_j / \sum_{j=1}^{m} w_j \qquad 4$$

Following Mussard and Pi Alperin (2005) it is possible to decompose multidimensional poverty indices by sub-population. Suppose the total economic surface is divided into K groups, S_k, of size n_k (k=1,…, K). The intensity of poverty of the i-th household of S_k is given as:

$$\mu_B(a_i^k) = \frac{\sum_{j=1}^{m} x_{ij}^k w_j}{\sum_{j=1}^{m} w_j} \qquad 5$$

Where x_{ij}^{k} is the degree of membership related to the fuzzy sub-set B of the i-th household (i=1,…,n) of S_k with respect to the j-th attribute (j=1,…,m). Hence, the fuzzy poverty index associated with group S_k is:

$$\mu_B^k = \frac{\sum_{i=1}^{nk} \mu_B(a_i^k) g(a_i^k)}{\sum_{i=1}^{nk} g(a_i^k)} \qquad 6$$

Following equation (6), the overall poverty index can be computed as a weighted average of the poverty within each group:

$$\mu_B = \frac{\sum_{k=1}^{k} \sum_{i=1}^{nk} \mu_B(a_i^k) g(a_i^k)}{\sum_{i=1}^{n} g(a_i)} \qquad 7$$

Thus, the contribution of the k-th group to the global index of poverty is:

$$C_{\mu B}^k = \frac{\sum_{i=1}^{nk} \mu_B(a_i^k) g(a_i^k)}{\sum_{i=1}^{n} g(a_i)} \qquad 8$$

In order to know the contribution of the welfare attribute, the multidimensional poverty indices was decomposed based on the contributions of each welfare attribute. The poverty ratio of the population μ_B is simply obtained as a weighted average of the poverty ratio of the i-th household $\mu_B(a_i)$

$$\mu_B = \sum_{i=1}^{n} \mu_B(a_i) g(a_i) / \sum_{i=1}^{n} g(a_i). \qquad 9$$

Similarly,

$$\mu_B(X_j) = \sum_{i=1}^{n} x_{ij} g(a) / \sum_{i=1}^{n} g(a_i) \qquad 10$$

In this way it is possible to decompose the multidimensional poverty ratio of the population μ_B as the weighted average of μ_B (X_j), with weight w_j.

$$\mu_B = \sum_{i=1}^{n} \mu_B(a_i) g(a_i) / \sum_{i=1}^{n} g(a_i) = \sum_{j=i}^{m} \mu_B(X_j) w_j / \sum_{j=1}^{m} w_j \qquad 11$$

3. Results and Discussions

Descriptive analysis of respondents' socio-economic characteristics

Table 1 presents the socio-economic characteristics of the respondents across the gender of household heads and marital status. It reveals that northern/middle belt states had highest proportions of their respondents being males. Specifically, Kebbi, Bauchi, Niger, Kano, Sokoto and Zamfara states had highest values of 99.54 percent, 98.91 percent, 98.71 percent, 98.69 percent, 98.58 percent and 98.54 percent respectively. This can be attributed to religious practices whereby in predominantly Islamic society of the northern Nigeria, women are sometimes forbidden from showing their faces in public places. Therefore, women are kept indoor and are only able to interact within the house.

The table also shows that based on marital status, respondents from northern states had highest proportions being married as monogamy and polygamy. Polygamous respondents from Katsina, Zamfara, Kebbi, Kano, Jigawa and Gombe states accounted for 38.62 percent, 38.23 percent, 36.42 percent, 35.32 percent,, 34.20 percent and 29.78 percent, respectively. However, monogamous respondents from Plateau, Sokoto, Bauchi, Norno Niger and Taraba states constituted 73.88 percent, 73.47 percent, 67.14 percent, 67.13 percent, 66.89 percent and 65.74 percent respectively. Enugu and Abia states have highest proportions of their respondents.

Table 1: Percentage distributions of rural households' heads gender and marital status across the Nigerian States

States	Male (%)	Female (%)	Single	Mono-gamous	Poly-gamous	Informal	Widowed, divorce, separated	Total Freq
Abia	71.40	28.60	5.69	59.50	5.25	0.22	29.34	1353
Adamawa	93.60	6.40	6.15	64.41	20.87	0.00	8.57	1610
Akwa Ibom	77.38	22.62	9.49	61.31	5.07	0.79	23.34	2781
Anambra	74.10	25.90	4.94	65.50	4.86	0.00	24.70	1255
Bauchi	98.91	1.09	1.58	67.14	28.55	0.00	2.73	1832
Bayelsa	77.13	22.87	9.60	48.02	22.41	5.03	14.94	656
Benue	91.29	8.71	10.64	61.60	16.07	0.14	11.55	2078
Borno	95.47	4.53	3.24	67.13	21.54	0.00	8.09	2163
Cross River	76.71	23.29	13.04	56.89	7.07	3.39	19.60	1357
Delta	70.59	29.41	9.47	52.09	9.79	4.55	24.12	1870
Ebonyi	76.39	23.61	5.76	55.61	13.17	0.39	25.07	1025
Edo	76.60	23.40	9.66	53.28	12.91	1.74	22.42	1325
Ekiti	75.81	24.19	5.90	55.96	12.88	1.20	24.07	831
Enugu	71.11	28.89	3.91	58.84	6.49	0.27	30.49	1125
Gombe	98.53	1.47	5.66	61.27	29.78	0.00	3.28	883
Imo	76.29	23.71	6.88	64.02	3.48	0.09	25.54	2240
Jigawa	97.55	2.45	1.46	60.69	34.20	0.00	3.64	2526

Kaduna	97.42	2.58	4.22	64.50	28.16	0.00	3.11	1896
Kano	98.69	1.31	1.93	60.19	35.32	0.00	2.56	3828
Katsina	98.11	1.89	1.42	57.59	38.62	0.00	2.37	2957
Kebbi	99.54	0.46	0.40	62.14	36.42	0.00	1.04	1738
Kogi	77.64	22.36	11.11	55.76	12.88	0.68	19.56	1467
Kwara	80.26	19.74	6.67	53.47	22.30	0.00	17.55	1094
Lagos	87.23	12.77	6.38	62.31	16.41	0.00	14.89	329
Nasarawa	97.35	2.65	9.76	60.50	25.53	0.08	4.14	1281
Niger	98.74	1.26	3.21	66.89	26.48	0.00	3.42	1903
Ogun	75.40	24.60	7.34	48.46	15.60	0.42	28.19	1199
Ondo	78.38	21.62	8.66	49.17	14.69	2.15	25.33	1212
Osun	73.45	26.55	6.13	46.89	24.33	0.18	22.47	2203
Oyo	85.72	14.28	9.35	59.79	14.55	0.22	16.08	1828
Plateau	95.04	4.96	6.69	73.88	12.75	0.00	6.69	1271
River	77.41	22.59	12.94	57.94	5.87	4.13	19.11	1669
Sokoto	98.58	1.42	1.52	73.47	23.28	0.00	1.73	1907
Taraba	96.75	3.25	11.09	65.74	17.36	0.30	5.51	1325
Yobe	97.90	2.10	2.77	64.12	29.24	0.00	3.87	1190
Zamfara	98.54	1.46	1.30	58.52	38.23	0.08	1.87	1232
FCT	96.00	4.00	14.57	62.86	18.57	0.00	4.00	350
Total	87.72	12.28	5.92	60.31	20.43	0.61	12.73	58789

Source: Author's computation from the 2006 CWIQ data.

Table 2 shows the distribution of respondents based on occupation. As expected of typical rural Nigerian areas, agriculture and self employment dominate the occupational distributions. The table shows that the percentages of the respondents from Benue, Ebonyi, Zamfara, Niger, Katsina, Kebbi and Edo states in agriculture were 76.13, 72.59, 69.32, 62.50, 61.62and 60.30 respectively. However, bayelsa, Bauchi, Yobe, Gombe and Zamfara states have their proportions of unemployed household heads being highest and higher than 3 percent.

Table 2: Percentage distribution of rural respondents across the employment groups in Nigerian States

States	None	Public	Private formal	Private informal	Self agriculture	Self others	Unemployed	Others	Total Freq
Abia	2.07	7.46	3.10	2.07	49.45	23.58	0.52	11.75	1353
Adamawa	6.77	9.32	0.93	1.68	45.71	10.06	2.30	23.23	1610
Akwa Ibom	3.60	10.82	3.16	4.31	32.11	38.48	1.58	5.93	2781
Anambra	3.51	4.62	3.11	3.43	43.59	28.53	1.27	11.95	1255
Bauchi	3.00	6.60	0.71	3.66	36.24	30.29	3.33	16.16	1832
Bayelsa	4.57	19.05	2.29	1.98	24.70	36.74	3.35	7.32	656
Benue	3.13	7.75	0.82	0.63	76.13	5.10	0.82	5.63	2078
Borno	4.67	5.83	0.83	3.47	57.70	13.41	0.18	13.92	2163
Cross River	2.36	14.52	2.58	1.47	59.91	14.15	0.44	4.57	1357
Delta	3.74	9.04	3.74	5.72	36.31	29.63	2.51	9.30	1870
Ebonyi	3.41	6.44	0.68	0.98	72.59	11.71	0.10	4.10	1025
Edo	4.91	5.74	1.51	0.83	60.30	17.36	1.13	8.23	1325
Ekiti	3.01	11.43	1.81	1.56	51.99	21.54	0.36	8.30	831
Enugu	1.87	9.51	0.89	3.20	56.09	18.31	0.18	9.96	1125
Gombe	2.83	4.64	0.23	4.08	52.10	17.67	3.06	15.40	883
Imo	4.87	6.03	3.08	2.14	38.39	31.29	0.85	13.35	2240
Jigawa	2.81	7.44	0.24	2.73	50.87	17.81	0.44	17.66	2526
Kaduna	5.91	12.97	1.21	1.58	48.52	21.36	0.26	8.18	1896
Kano	2.80	7.55	1.15	1.99	49.63	30.33	1.20	5.36	3828
Katsina	3.35	4.57	0.24	4.87	62.50	15.42	2.03	7.03	2957
Kebbi	3.05	6.96	0.23	7.77	61.62	15.65	1.38	3.34	1738
Kogi	2.39	12.07	2.52	1.02	48.33	21.75	0.68	11.25	1467
Kwara	4.20	11.43	1.83	1.19	44.33	27.51	1.10	8.41	1094
Lagos	2.13	17.63	6.38	1.22	13.37	46.81	1.22	11.25	329
Nasarawa	2.50	16.86	1.09	7.34	45.04	14.13	3.04	9.99	1281
Niger	3.15	10.67	0.95	4.78	64.06	11.25	0.26	4.89	1903
Ogun	3.75	5.09	1.17	1.00	56.55	25.02	0.33	7.09	1199
Ondo	2.48	8.09	1.98	2.39	51.90	25.83	0.74	6.60	1212
Osun	2.91	7.26	2.41	2.00	37.59	36.36	0.50	10.99	2203
Oyo	3.01	5.14	1.75	2.68	51.75	28.67	0.71	6.29	1828
Plateau	2.05	9.21	1.65	1.57	60.11	8.18	1.26	15.97	1271
River	5.15	14.80	6.47	8.75	28.28	27.80	2.16	6.59	1669
Sokoto	3.36	6.35	0.31	6.24	58.57	15.15	1.52	8.50	1907

Taraba	6.11	13.81	0.75	5.81	53.36	13.43	0.91	5.81	1325
Yobe	11.09	5.88	0.08	8.24	32.27	17.65	3.11	21.68	1190
Zamfara	4.46	4.38	0.24	2.84	69.32	9.17	0.16	9.42	1232
FCT	2.57	18.00	6.86	0.29	51.43	13.43	0.00	7.43	350
Total	3.71	8.60	1.64	3.35	50.24	21.59	1.21	9.65	58789

Source: Author's computation from the 2006 CWIQ data.

Table 3 shows the distribution of the respondents across educational levels. It reveals that states with high proportions of household heads with no education were Yobe (90.25 percent), Kebbi (90.16 percent), Sokoto (89.09 percent), Zamfara (86.77 percent), Borno (83.59 percent) and Katsina (80.72 percent). These are all in northern Nigeria. Akwa Ibom, Lagos, Imo, Rivers and Cross Rover states have the lowest proportions of their household heads not having formal education.

Table 3: Frequency distribution of rural house heads' educational levels across the Nigerian States

States	None	Some primary	Completed primary	Some secondary	Completed secondary	Post secondary	Total Freq
Abia	30.52	9.61	31.86	5.25	14.63	8.13	1353
Adamawa	56.71	2.55	10.43	6.52	14.91	8.88	1610
Akwa Ibom	24.02	13.30	31.64	7.08	13.56	10.39	2781
Anambra	31.16	11.87	37.93	4.62	8.61	5.82	1255
Bauchi	72.93	1.53	10.75	2.78	7.21	4.80	1832
Bayelsa	30.64	4.12	16.31	7.93	27.29	13.72	656
Benue	37.54	4.28	19.35	7.84	21.03	9.96	2078
Borno	83.59	0.74	4.95	0.88	5.18	4.67	2163
Cross River	29.85	8.99	25.94	8.25	14.66	12.31	1357
Delta	33.37	4.76	20.80	9.47	19.84	11.76	1870
Ebonyi	55.51	7.90	20.29	2.54	7.12	6.63	1025
Edo	36.15	3.02	22.04	5.89	24.08	8.83	1325
Ekiti	44.77	3.37	17.21	4.33	13.84	16.49	831
Enugu	49.60	7.73	28.44	2.22	5.51	6.49	1125
Gombe	76.10	1.81	10.08	2.49	4.53	4.98	883
Imo	28.62	12.32	32.72	3.66	13.44	9.24	2240
Jigawa	82.15	1.23	9.11	0.79	2.89	3.84	2526
Kaduna	56.07	3.22	9.97	4.17	15.08	11.50	1896
Kano	73.88	1.02	14.05	1.41	4.83	4.81	3828
Katsina	80.72	1.52	10.08	1.35	3.42	2.91	2957
Kebbi	90.16	0.58	4.95	0.46	1.73	2.13	1738
Kogi	50.31	3.34	15.61	2.73	16.16	11.86	1467
Kwara	62.71	1.74	10.51	2.01	10.97	12.07	1094
Lagos	28.57	1.82	24.32	4.26	27.05	13.98	329
Nasarawa	42.08	3.83	16.32	8.35	15.22	14.21	1281
Niger	78.82	0.21	4.52	0.68	7.99	7.78	1903
Ogun	55.21	3.75	18.85	4.50	9.84	7.84	1199
Ondo	36.96	3.22	23.02	6.19	16.83	13.78	1212
Osun	43.89	3.40	18.11	4.63	17.52	12.44	2203
Oyo	55.91	2.52	18.22	3.72	12.04	7.60	1828
Plateau	54.21	3.93	15.03	6.53	12.98	7.32	1271
River	28.88	3.18	19.53	4.07	30.74	13.60	1669
Sokoto	89.09	0.84	4.61	0.73	1.99	2.73	1907
Taraba	50.57	3.70	8.30	7.02	17.66	12.75	1325
Yobe	90.25	1.01	4.20	1.09	1.26	2.18	1190
Zamfara	86.77	1.22	4.55	1.62	3.17	2.68	1232
FCT	48.00	0.86	11.71	5.14	18.86	15.43	350
Total	56.57	3.92	16.08	3.88	11.45	8.11	58789

Source: Author's computation from the 2006 CWIQ data.

Construction of composite multidimensional poverty indices

Table 4 shows the variables that were selected for multidimensional poverty measure and their weights. The highest weight was attached to ownership of dwelling place. It implies that most rural dwellers own their houses. Also, majority of rural households owns a mat; therefore not having it attracts greater weight. Ownership of fixed telephone line was given low weight. This implies that very few rural dwellers possess fixed telephone line, therefore the household head that does not have should not be penalized for not having it. It is not the life style of rural dwellers. Other attributes with low weight include ownership of a personal computer, use of insecticide treated net, ownership of a camel and ownership of a gas cooker.

Table 4: Weight attached to each attribute

Attributes	Weight	Attributes	Weight
Material of the roof of the house	0.1866	Own a bicycle?	0.1917
Material of the walls of the house	0.3253	Own a motorcycle	0.0868
Material of the floor of the house	0.2879	Own a vehicle	0.0179
Housing unit type	0.0543	Own a canoe	0.0147
Number of rooms per person	0.7501	Own a donkey	0.0281
Main source of drinking water	0.2385	Own a camel	0.0042
Problems with supply of drinking water	0.4462	Education level of head of household	0.1355
Water treated before drinking	0.0529	Own a generator	0.0233
Type of toilet facility	0.2380	Source of electricity	0.1736
Type of refuse collection	0.1358	Main fuel used for lighting	0.1439
Maintain good drainage	0.0101	Main fuel used for cooking	0.2425
Maintain good sanitation	0.0365	Own a television	0.0832
Dwelling has window/door net	0.0198	Own a fixed line telephone	0.0019
Own the dwelling	0.9392	Own a mobile phone	0.0556
Problem satisfying food needs	0.4760	Own a radio	0.6304
Problems paying school fees	0.5420	Member provides materials	0.0191
Problems paying house rent	0.8801	Member provides labour	0.0737
Problems paying utility bills	0.6868	Member provides management	0.0182
Problems paying for health care	0.4328	Member provides funds	0.0457
Improved household economic state	0.3122	Uses bed net to prevent malaria	0.0674
Improved community economic state	0.3010	Uses insecticide against malaria	0.1836
Members perceived household to be poor	0.1759	Uses anti-malaria drug	0.0778
Security situation of the community	0.2815	Uses fumigation against malaria	0.0106
Own an electric iron	0.0713	Uses insecticide treated net	0.0030
Own a charcoal iron	0.1455	Area of land owned (hectares)	0.2079
Own a refrigerator	0.0326	Number of cattle and other large animals	0.0408
Own a personal computer	0.0020	Number of sheep, goats, etc. owned	0.0914
Own a mattress or bed	0.8602	Time to supply of drinking water	0.7088
Own a watch or clock	0.5994	Time to food market	0.3357
Own a modern stove	0.1266	Time to nearest public transportation	0.4244
Own a gas cooker	0.0045	Time to nearest primary school	0.5302
Own a fan	0.1020	Time to nearest secondary school	0.2412
Own a mat	0.9311	Time to nearest health clinic or hospital	0.3033
Own a VCR	0.0352	Time to nearest all seasons road	0.3656
Own furniture	0.2077		

Source: Computed from the 2006 CWIQ data.

Multidimensional poverty index in rural Nigeria

Table 5 shows the multidimensional poverty decomposition across the states. It shows that the highest average multidimensional poverty index of 0.4508 was observed in Yobe while the lowest average multidimensional poverty index of 0.3235 was observed in FCT. The corresponding variability index was 21.84 and 28.14 percent respectively. Adamawa, Akwa Ibom, Anambra, Bayelsa, Benue, Cross River, Delta, Ebonyi, Edo, Enugu, Imo, Kebbi, Ogun, Oyo, Plateau, Rivers, Taraba, Yobe, and Zamfara had average multidimensional poverty index that is higher than the overall average multidimensional poverty index. The highest variability index was observed in Osun while the lowest was observed in Yobe. Kano had the highest absolute contribution to multidimensional poverty of 0.0221. Akwa Ibom also had high absolute contribution to multidimensional poverty of 0.0192. The lowest absolute contribution to multidimensional poverty of 0.0019 was observed in FCT. Lagos also had low absolute contribution to multidimensional poverty of 0.002. The Levene's test shows that the variances of multidimensional poverty indices across the states are significantly different ($P<0.01$). Using the Welch and Brown-Forsythe F statistics, it was concluded that multidimensional poverty indices were significantly different ($p< 0.01$) across the states. Therefore null hypothesis 1 for the states was hereby rejected.

Table 5: Multidimensional poverty decomposition across Nigerian states

State	Freq	Av. MPI	Std. Deviation	CV	Absolute Contributions
Abia	1353	0.3645	0.1007	27.6334	0.0084
Adamawa	1610	0.3940	0.0969	24.5943	0.0108
Akwa Ibom	2781	0.4060	0.1027	25.2908	0.0192
Anambra	1255	0.4092	0.1154	28.2019	0.0087
Bauchi	1832	0.3775	0.1041	27.5755	0.0118
Bayelsa	656	0.4010	0.1021	25.4716	0.0045
Benue	2078	0.3868	0.1071	27.6841	0.0137
Borno	2163	0.3795	0.1019	26.8502	0.0140
Cross River	1357	0.4225	0.1086	25.6973	0.0098
Delta	1870	0.3957	0.1109	28.0182	0.0126
Ebonyi	1025	0.4251	0.1123	26.4125	0.0074
Edo	1325	0.3900	0.1095	28.0809	0.0088
Ekiti	831	0.3614	0.1008	27.9057	0.0051
Enugu	1125	0.4109	0.0972	23.6414	0.0079
Gombe	883	0.3755	0.0999	26.6101	0.0056
Imo	2240	0.4148	0.1071	25.8156	0.0158
Jigawa	2526	0.3523	0.0999	28.3571	0.0151
Kaduna	1896	0.3413	0.1041	30.5049	0.0110
Kano	3828	0.3392	0.0873	25.7354	0.0221
Katsina	2957	0.3680	0.0953	25.8857	0.0185
Kebbi	1738	0.3801	0.0967	25.4398	0.0112
Kogi	1467	0.3572	0.0953	26.6869	0.0089
Kwara	1094	0.3610	0.1030	28.5265	0.0067
Lagos	329	0.3577	0.1041	29.1136	0.0020
Nasarawa	1281	0.3733	0.0995	26.6666	0.0081
Niger	1903	0.3305	0.0978	29.5833	0.0107
Ogun	1199	0.3931	0.1041	26.4821	0.0080
Ondo	1212	0.3607	0.1014	28.1268	0.0074
Osun	2203	0.3517	0.1111	31.5915	0.0132
Oyo	1828	0.3926	0.1184	30.1615	0.0122
Plateau	1271	0.4230	0.1024	24.1993	0.0091
River	1669	0.3802	0.1132	29.7842	0.0108
Sokoto	1907	0.3502	0.0887	25.3363	0.0114
Taraba	1325	0.4443	0.1068	24.0344	0.0100
Yobe	1190	0.4508	0.0985	21.8423	0.0091
Zamfara	1232	0.3811	0.1017	26.6901	0.0080
FCT	350	0.3235	0.0910	28.1426	0.0019
Total	58789	0.3796	0.1065	28.0541	0.3796

Table 6 shows the relative contributions of multidimensional poverty decomposition of the grouped attributes across the States in Nigeria. The attribute education has the lowest relative contribution to multidimensional poverty in all the states. Housing/sanitation has the high relative contribution multidimensional poverty in the following states Kano (1.40 percent), Kastina (1.12 percent), Jigawa (0.99 percent), Akwa Ibom (0.90), Osun (0.88 percent), Borno (0.78 percent), Benue (0.77 percent), Oyo (0.73 percent), Delta (0.71) and Sokoto (0.70 percent), Economic condition/security has the high relative contribution to multidimensional poverty in the following states Akwa Ibom (1.21 percent), Imo (1.19 percent), Kano (1.04 percent), Katsina (0.96 percent), Delta (0.90 percent), Anambra (0.78 percent), and Osun (0.75).

Lagos state has the lowest relative contribution to multidimensional poverty in the following attributes housing/sanitation (0.13 percent), goods equipment and assets (0.07 percent), education (0.01 percent), energy (0.02 percent), community project involvement (0.01 percent), health (0.02 percent) and access to basic infrastructure (0.05 percent). FCT has the lowest relative contribution to multidimensional poverty in the following attributes

economic condition/security (0.08 percent), means of transportation (0.03 percent), communication (0.02 percent) and ownership of land and livestock (0.02 percent). It is observed that Kano has the highest relative contribution to multidimensional poverty in the following attributes housing/sanitation (1.40 percent), goods equipment and assets (0.92 percent), means of transportation (0.23 percent), education (0.12 percent), energy (0.40 percent), communication (0.22 percent), community project involvement (0.15 percent) and Health (0.24 percent). Akwa Ibom has the highest relative contribution to multidimensional poverty in the attributes economic condition/security (1.21 percent), ownership of land and livestock (0.23 percent) and access to basic infrastructure (1.08 percent). Across the attributes the highest and lowest relative contribution to multidimensional poverty is observed in Kano (5.82 percent) and FCT (0.0019 and 0.51 percent).

Table 6 Relative contributions of multidimensional grouped attributes to rural deprivation across the States in Nigeria

State	Housing/ sanitation	Economic condition /security	Goods equipment and assets	Means of transportation	Education	Energy	Communication	Comm. project involvement	Health	Ownership of land and livestock	Access to basic infrastructure	Total
Abia	0.3965	0.5905	0.2897	0.0931	0.0310	0.1134	0.0922	0.0531	0.1041	0.1153	0.3311	2.2099
Adamawa	0.6267	0.5125	0.4778	0.1069	0.0418	0.1883	0.1199	0.0626	0.1056	0.0875	0.5130	2.8425
Akwa Ibom	0.9043	1.2128	0.5880	0.1747	0.0606	0.2819	0.2158	0.1029	0.2102	0.2321	1.0758	5.0593
Anambra	0.3498	0.7796	0.1941	0.0966	0.0309	0.1040	0.0614	0.0490	0.0917	0.1034	0.4406	2.3012
Bauchi	0.6889	0.5402	0.4246	0.1160	0.0560	0.2106	0.1443	0.0718	0.1330	0.1084	0.6049	3.0989
Bayelsa	0.2635	0.2438	0.1720	0.0578	0.0126	0.0615	0.0509	0.0270	0.0505	0.0535	0.1855	1.1788
Benue	0.7717	0.6120	0.5706	0.1423	0.0458	0.2467	0.1742	0.0786	0.1431	0.1000	0.7165	3.6014
Borno	0.7816	0.5897	0.5743	0.1522	0.0704	0.2507	0.2022	0.0874	0.1341	0.1070	0.7288	3.6784
Cross River	0.6001	0.5733	0.3157	0.1098	0.0294	0.1365	0.1186	0.0495	0.1019	0.1175	0.4167	2.5689
Delta	0.7179	0.9039	0.4321	0.1330	0.0395	0.1568	0.1602	0.0774	0.1380	0.1482	0.4087	3.3156
Ebonyi	0.3505	0.3544	0.3357	0.0661	0.0288	0.1141	0.0765	0.0343	0.0809	0.0841	0.4271	1.9524
Edo	0.4613	0.5291	0.3307	0.0977	0.0287	0.1098	0.1039	0.0511	0.1088	0.0948	0.3997	2.3156
Ekiti	0.3284	0.2710	0.2169	0.0702	0.0190	0.0782	0.0595	0.0342	0.0649	0.0626	0.1407	1.3457
Enugu	0.3485	0.4443	0.3218	0.0768	0.0310	0.1198	0.0714	0.0415	0.0925	0.0943	0.4296	2.0716
Gombe	0.3356	0.2705	0.2103	0.0618	0.0278	0.1009	0.0756	0.0366	0.0486	0.0461	0.2721	1.4858
Imo	0.6230	1.1937	0.4644	0.1450	0.0513	0.2052	0.1402	0.0826	0.1631	0.1601	0.9346	4.1631
Jigawa	0.9899	0.5775	0.6238	0.1851	0.0832	0.2985	0.2234	0.0846	0.1683	0.1206	0.6333	3.9881
Kaduna	0.6699	0.5885	0.4463	0.1136	0.0483	0.1886	0.0965	0.0735	0.1245	0.1179	0.4319	2.8995
Kano	1.4032	1.0410	0.9183	0.2257	0.1192	0.4008	0.2243	0.1472	0.2384	0.2021	0.8990	5.8191
Katsina	1.1201	0.9576	0.6887	0.1730	0.0970	0.3359	0.2010	0.1068	0.2022	0.1393	0.8547	4.8763
Kebbi	0.6559	0.5779	0.5144	0.1097	0.0602	0.1922	0.1186	0.0601	0.0876	0.0855	0.4977	2.9600
Kogi	0.5416	0.4846	0.3280	0.1067	0.0360	0.1351	0.1059	0.0512	0.1177	0.1177	0.3240	2.3484
Kwara	0.4195	0.3940	0.2517	0.0823	0.0295	0.0988	0.0795	0.0396	0.0836	0.0850	0.2063	1.7698
Lagos	0.1259	0.1439	0.0679	0.0295	0.0063	0.0179	0.0215	0.0127	0.0229	0.0273	0.0517	0.5274
Nasarawa	0.4959	0.5253	0.2813	0.0765	0.0289	0.1362	0.0717	0.0438	0.0795	0.0875	0.3162	2.1427
Niger	0.6500	0.5472	0.4772	0.0986	0.0585	0.2004	0.1023	0.0673	0.1048	0.1028	0.4093	2.8184
Ogun	0.4654	0.4232	0.3640	0.0993	0.0323	0.1108	0.0907	0.0413	0.0849	0.0921	0.3080	2.1122
Ondo	0.4792	0.4168	0.2980	0.1052	0.0264	0.1060	0.0738	0.0498	0.0817	0.0834	0.2384	1.9589
Osun	0.8816	0.7489	0.5194	0.1906	0.0509	0.1743	0.1438	0.0823	0.1585	0.1578	0.3641	3.4722
Oyo	0.7831	0.6036	0.5142	0.1562	0.0489	0.1785	0.1410	0.0713	0.1322	0.1209	0.4661	3.2161
Plateau	0.4799	0.4437	0.4148	0.0907	0.0335	0.1526	0.1082	0.0496	0.1019	0.0690	0.4652	2.4092
River	0.5805	0.6634	0.3721	0.1142	0.0313	0.1611	0.1236	0.0666	0.1243	0.1363	0.4699	2.8433
Sokoto	0.7040	0.4007	0.5209	0.1449	0.0654	0.2233	0.1246	0.0743	0.1185	0.1386	0.4778	2.9929
Taraba	0.5294	0.6484	0.4140	0.0992	0.0316	0.1618	0.1266	0.0483	0.1055	0.0785	0.3949	2.6382
Yobe	0.5190	0.4473	0.3378	0.0856	0.0413	0.1440	0.1263	0.0483	0.0781	0.0631	0.5131	2.4037
Zamfara	0.4711	0.3896	0.2785	0.0762	0.0416	0.1445	0.0756	0.0468	0.0794	0.0668	0.4335	2.1038
FCT	0.1304	0.0824	0.0716	0.0264	0.0079	0.0320	0.0162	0.0140	0.0257	0.0224	0.0784	0.5074

Source: Computation from the 2006 CWIQ data.

4. Conclusion

Multidimensional approach (Fuzzy set) is very robust method of poverty analysis in that it revealed that degree of poverty varies. This study examines the multidimensional aspects of the phenomenon of poverty and living conditions of rural household head across the States in Nigeria. It further looked at a synthetic analysis of decomposition that point out the dominant attributes/dimensions (housing/sanitation, economic condition/security, education, energy, etc.). The result shows that the multidimensional poverty for the rural Nigeria is 0.3796. It has been shown that housing/sanitation and economic condition/security are the main factor of poverty across the states. Also, most states in the northern part of the country have the highest percentage of those with no education. In order to implement socio-economic policies to reduced poverty diffusion, based on the findings, reform actions should be directed towards education, improving housing/sanitation and economic/security conditions.

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Retail inventory management and accounting; a review of some basic principles of success

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Abstract: The need for tracking and assessment of the retail materials and the challenges related to handling its features has become a leading force for the growth of retail inventory management systems. As a general rule, for tracking the company's whole products, every retail business needs to implement retail inventory management system. This paper has a concise focus on the basics of retail inventory management. Then the author takes a look to advantages and methods of the inventory management. Also a brief review of retail inventory accounting and components will be provided and at the end the paper ends with the ways for success in the retail inventory management.

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Introduction:

Retail inventory management systems work based on controls and such controls apply to storage, retail turn-over, tracking inventory, shopping, ordering and receiving. Many scholars believe that a successful retail inventory management should have the following capabilities:

a. Tracking all of the business inventory
b. Makes you able to review your inventory accurately
c. Evaluate the strength or weakness of some products in selling process
d. Compares the shopping amounts of all the products

The top 4 capabilities are considered to be the building stone of the retail inventory management systems.

There are four common types of retail inventory management systems; electronic suppliers, barcode readers, point of sale terminals and inventory systems. Electronic suppliers update the amounts of the inventory via the internet. Barcode readers make it easy to quick track. Point of sale terminals; update the inventory based on a predetermined point of sale (Brinlee, 2012).

Some of the other business specialists argue that there are five advantages for using RIM over a system of inventory at cost. The does not have to "cost" each time. When retailers have many SKUs, keeping track of each item becomes difficult and expensive. It is easier to determine the value of inventory with the retail prices marked on the merchandise than unmarked or at coded cost prices. The second advantage for using RIM is that it follows the accepted accounting principal of valuing assets at cost or market value, which is lower. This system lowers the value of inventory when markdowns are taken but does not allow inventory's value increase with additional markups. When using RIM, the amounts and percentages of initial markups, markdowns, and shrinkage can be identified. This information can then be compared with historical records or industry norms. RIM is useful for determining shrinkage. The difference between the book inventory and the physical inventory can be attributed to shrinkage. The book inventory determined by RIM can be used in an insurance claim in case of a loss. The disadvantages of RIM are system that uses average markup. When markup percentages change during a period or when the inventory on hand at a particular time is not representative of the total goods handled in terms of markup, the resulting cost may be distorted. The inventory turnover, merchandise budget planning, open to buy, all these should be applied to the RIM category basis to avoid the problem. There are four steps in when calculating RIM. Calculate total goods handled at cost and retail, calculate retail reductions, calculate the cumulative markup and cost multiplier, and determine ending book inventory.

Retail Inventory-Level Planning consists of retail inventory method (RIM) which is an accounting procedure whose objectives are to maintain a perpetual. It also can book inventory in retail dollars amounts and to maintain records that make it possible to determine the cost value of the inventory at any time without taking a physical inventory. Also known as book inventory system or perpetual book inventory. Retailers also have another important choice to make the stock to sales ratio. The stock to sales ratio is derived directly from the planned inventory to determine monthly additions to stock in the merchandise budget plan.

Retailers generally think of their inventory at retail price levels rather than at cost. Retailers use their initial markups, additional markups, and markdowns, and so forth as percentages of retail. When retailers compare their prices to competitors', they use retail prices. The problem is that when retailers to design their financial plans, evaluate performance, and prepare financial statements, they need to know the cost value of their inventory. Retailers use physical inventories. This process is time consuming and costly. Retailers take physical inventories once or twice a year.

Factors of Success in Retailing

Knowing ourselves

Identify your interests, skills, abilities and limitations. It is more desirable to keep your current job than creating a new one. In order to be successful as a retailer, you need to be selfless. You must play a key role in marketing, sales, and directing staff. It is virtually impossible for one individual to take on all these responsibilities and accomplish successfully. You have to know where you can excel and where you will need help. This is why you need to identify and evaluate your strengths and weaknesses objectively.

Prospective Planning

Most businesses are managed by some people who do not have a thorough knowledge of their jobs. If you are not aware of the current inputs and outputs of your business as the owner of a specialized store, you are most likely to lose your job in near future. According to experts, a lack of a thorough and sound knowledge rather than money is the main cause of 80% of bankruptcies during the first 5 years. The key to your success is to know how to make proper decisions by implementing an effective business plan.

Knowing the Industry

If you fully understand the concept of profession, you will be able to benefit in a part of a large competition. Distinguishing features which can challenge your survival in the future include: competition, size, services, marketing, access, customers, suppliers, the competitors' pricing strategies, market, local businesses, vacancies in advertisement contexts, household average income, education, age group, ethnicity, and the number of potential customers.

Understanding the Customers

Do you listen to your customers? Plan your business in such a way that you give your customers what they want and you will see they will shop from your store and will contribute to your success.

Preserving Financial Records

If you do not know where your money goes, you will soon lose the game. In the game of business, which is played by computer and credits are dollars and cents, good financial records are similar to an airplane's navigation system which shows you the latitude, direction and speed.

Managing the Cash

No matter how unique your business is, it cannot survive without cash flow. It serves as blood and the vital power of your business. The money that goes into or out of your business guarantees the well-being of your business. The monthly cash flow bills indicates the amount of cash ate the beginning of each period as well as the one received from various sources and the reasons for spending money if you budget wisely and keep track of monthly income and expenditures, you will not need to worry about money.

Control of the Assets

The role of your assets is to create sales. All retail businesses need to manage their assets. It is your money sitting on the shelves and shows a big part of your assets. Small retailers who just see their shelves cannot create a balance between the true amount of goods and the customers' potential needs. The transactions made by such retailers will suffer by a lack of information about color, sixe, and the customers' attitudes and priorities. Without a proper control, assets will be outdated and remain in the store, which will cost a fortune for retailers.

Pricing based on the Recognition of Retailing

To begin with, the initial price of your goods is a temporary account of what the customers tend to consume. Most stores use the "key stone" on their signs to raise prices of used goods and services. What they lack is a pricing strategy based on a case pricing for order, progress, and bargain goods. In order to succeed in sales, retailers have to focus on items, prices, and effectiveness and try to boost their sale by having entertainment and fun activities. In order to be competitive, pay attention to trade shows, take part in shopping groups, and look for producers who allow you to shop wholesale. By offering a new price wisely set you will be able to attract more customers, increase your average sales, and give more opportunities to your customers to visit your store.

Conclusion:

Retail inventory management is the one of success keys in the selling process in today's turbulent business. For making the business more

competitive, the retail inventory management and accounting should be a successful task of any company. The key element success factors of retailing have been discussed in the paper. Following the mentioned rules may be a key and a way to successful retailing.

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Factors Affecting Educational Tourism Development among Local Communities in the Klang Valley, Malaysia

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Abstract: The purpose of this study is to examine factors influencing educational tourism development among local communities in Malaysia. The results denote that socio-cultural impact, economic impact, and local community attitudes towards educational tourism were significantly related to residents' practice and communication with international students. In addition, residents' attitude can affect local communities' interaction with international students more than other variables. Since educational tourism plays an increasingly important role in the development of communities in Malaysia, the implications of this study provide new insights into future researches by highlighting this current challenge.
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1. Introduction

Nowadays, tourism has been gaining attention in the global economy. The development of tourism is viewed as a resource of new employment, foreign exchange, additional taxes, and an enhancement to community infrastructure that will fascinate other industries (Jud and Krause, 1976; Cooke, 1982; Loukissas, 1983; Liu and Var, 1986; McIntosh and Goeldner 1986; Davis, Allen and Cosenza, 1988; Allen Long, Perdue, and Kieselbach, 1988; Lankford and Howard, 1994).

The South East Asian countries have been rapidly growing to attract tourists from abroad since 2001 (Hsu et al., 2009). Malaysia has a remarkable economic growth in the Association of Southeast Asian Nations (ASEAN). The tourism industry is Malaysia's third most important industry after the manufacturing and palm oil sector (Asari et al., 2011). Currently, educational tourism is one of the foremost segments of tourism around the world. Malaysia has also attained a world ranking of 11th in terms of total international student population around the worlds. Ministry of Higher Education (MOHE) has set a goal of 200,000 international students in Malaysia by the year 2020 (MOHE, 2011).

Educational tourism is a program which potential learners move to a location as a group with the aim of engaging in a learning practice directly related to the location (Bodger, 1998). However, the role of local community is an important issue in the evaluation of social impact of tourism and it has not received much consideration in tourism literature (McCool & Martin, 1994). There is a lack of studies on educational tourism and the local communities' attitude toward this issue, particularly the international students and their impact on residents' life. Residents' behaviour toward tourism development and tourists, affect tourist satisfaction (Davis, Allen, and Cosenza 1988; Cooke 1982), which is another reason of considering residents as the major stakeholders in tourism planning and development process (Hall 1994; Jamal and Getz 1995; Joppe 1996).

Residents' perception toward sustainable tourism has significant influence on tourism development policy. Sirakaya, Ekinci, and Kaya (2008) stated that policy makers and destination marketers may benefit from a better understanding of residents' opinion toward sustainable tourism. Since one of the determinants of successful tourism is residents' perception, it is important to have a tool which enables us to measure different factors toward educational tourism development. Over the past few years, many researchers have examined several factors to measure resident's behaviour towards tourism development such as social, environmental, perceived economical benefit and attitude factors (Sirakaya, Jamal, and Choi, 2001; Ko and Stewart, 2002; Gursoy, Jurowski, and Uysal, 2002; Yu, Chancellor, and Cole, 2011).

The main objective of this study is to examine the relationship between the local

communities' attitude and the socio-cultural, economic, and environmental impacts of educational tourism with residents practice in educational tourism development. Should such a relationship exist between educational tourism development and perception of residents; the marketers and stakeholders have to examine the effectiveness of these relationships in marketing strategies. The importance of this study on factors affecting educational tourism would help marketers and researchers to analyze residents' support for educational tourism in diverse communities. This research investigates the factors affecting educational tourism which are perceived by residents in the Klang Valley, Malaysia.

2. Methodology

Based on previous studies and a pilot test, a multi-dimensional questionnaire was developed to evaluate residents' attitude and practices towards educational tourism development in Malaysia. Some casual in-depth interviews have also been conducted with different stakeholder groups towards educational tourism to help in constructing the questionnaire before a pilot study.

The instrument consisted of questions related to the socio-cultural, economic and environmental impacts of educational tourism on residents in the Klang Valley neighborhood in Malaysia. Besides, the instrument assessed residents' demographic variables. All items were measured using a 5-point Likert-scale, ranging from strongly disagree (1) to strongly agree (5). Economic impact was assessed by eight items. For example, "International students create employment opportunities for local residents."Socio-cultural impact was measured by 12 items. For instance, "Educational tourism is the major reason for the great variety of entertainment in Malaysia."

Environmental impact was evaluated by 7 items such as "Because of educational tourism public transportation has improved." The attitudes of residents were appraised by asking respondents to answer to the five statements such as "I am looking forward to meet international students to learn about their culture." Moreover, residents' practice towards educational tourism development was measured by asking them to reply to the five items. For example, "I have developed a friendship with international students."

Some informal in-depth interviews were carried out among different stakeholder groups of residents (e.g. tourists, residents, entrepreneurs, and local government officials) in the Klang Valley. Those interviews helped to construct and process the instrument. The instrument for the study was modified by the researchers through literature review and adjusted for content validity by an expert panel, which comprised two social scientists with specialty in community development and three key informants specialized in tourism industry. Besides, a pilot test was performed with actual residents in the Klang Valley to make certain that the statements selected had suitable psychometric characteristic.

A cross-sectional survey was conducted in six districts in Selangor namely Bangi, Petaling Jaya, Kuala Lumpur, Serdang, Gombak and Shah Alam which are located in the Klang Valley, and in Nilai in the district of Negeri Sembilan (an educational township placed next to Klang Valley). Most of public and private universities and colleges are also placed there such as Universiti Malaya, Universiti Kebangsaan Malaysia, Universiti Putra Malaysia, Universiti Teknologi Malaysia, International Islamic University Malaysia, Lim Kok Wing University, Sun Way College and INTI College, or etc. 700 questionnaires were distributed to residents of these areas for educational tourism development. Descriptive statistics were computed to examine the demographic characteristics of the sample. All analysis was achieved using SPSS version 20.0 (SPSS, Inc., Chicago, IL) in data processing and analyzing in order to answer the objective of this research.

Of the 700 questionnaire completed by residents in the Klang Valley, the mean age of the respondents was 33.46 years old, within the age range of 18-67. Males accounted for 60.4% of the respondents and female accounted for 39.6% respondents. The largest number of respondents (51.6%) reported middle school as their highest level of education. The results also demonstrated approximately 77.3% of the respondents were Malay and it followed by Chinese (12%) and Indians (9.7%). Majority of respondents were Muslim (77.3%) and were employed in services industries (39.7%). The average of salary was 3474.91 RM and it differed so widely among residents from high income (24000.00RM) to low income and no income respondents such as housewives and students (0.00 RM).

Table 1 illustrates the items for variables which were studied in multiple regression analysis for the paper.

Table 1. Measures of Variables

Variables	Items (strongly disagree - strongly agree)
Economic	International students in the nearby collage / university are our source of income. International students in this community made more opportunities for local entrepreneurs. International students in this community made more opportunities for foreign entrepreneurs. International students have given economic benefits to local people and small business. International students created employment opportunities for

	local residents. The presence of international students has increased the standard of living. The prices of goods and services have been increased due to the presence of international students. The presence of international students has increased the value of real estate (housing).
Socio-cultural	Educational tourism has improved my community here. Because of educational tourism, our quality of life has improved. Educational tourism is the major reason for the great variety of entertainment in Malaysia. The local community has got familiar with the diversity of culture brought by international students. Educational tourism results in more "cultural exchange" between local residents and international students. Educational tourists have a positive impact on Malaysian's cultural identity. Educational tourism has led to more prostitution and other misconduct cases (such as drugs trafficking). Educational tourism has increased street crime. Local residents are suffering living with international student in the same residential areas. The different types of culture (e.g. art, literature) that international students bring to Malaysian are more important than the social costs created by tourism. The differences of culture and tradition brought by the international students have given a positive impact on our own community. Meeting tourists (international students) from other regions is a valuable experience to understand their culture and society.
Environmental	Because of educational tourism public transportation has improved. Because of educational tourism health service has improved. Because of educational tourism more parks and other recreational areas have been developed. Because of educational tourism transportation systems are becoming more convenient. The construction of student's facilities for international students has destroyed the natural environment. Educational tourism has created traffic congestion, noise and air pollution. Educational tourism has resulted in crowded public places for the local population.
Practice	I have developed friendships with international students. My interactions with international students are positive and useful. I enjoy interacting with students. I enjoy visiting student's areas. Most people I know don't like to communicate with foreign students.
Attitude	The open policy by the government will encourage international students to study in Malaysia and promotes educational tourism. The initiative by the government to make Malaysia as an educational hub will encourage educational tourism. I am looking forward to meet international students to learn about their culture. Educational tourism will bring more positive outcomes than negative outcomes to the Malaysian people. If I have friends abroad, I would like to encourage them to send their children to study in Malaysia.

Table 2 shows the categorical socio-demographic variables of the survey respondents:

Table 2. Demographic Characteristic of the Respondents (n=700)

Gender	Male	423 (60.4%)
	Female	277 (39.6%)
Education	Elementary school	35 (5%)
	Middle school	361 (51.6%)
	College	132 (18.9%)
	Bachelor degree	126 (18%)
	Graduate degree	46 (6.6%)
Race	Malay	541 (77.3)
	Chinese	84 (12%)
	Indian	68 (9.7%)
	others	7 (1%)
Religion	Muslim	551 (78.7%)
	Buddha	63 (9%)
	Christian	31 (4.4%)
	Hindu	53 (7.6%)
	0thers	2 (.3%)
Occupation	Administration	27 (3.9%)
	Clerical	37 (5.3%)
	Marketing	244 (34.9%)
	Not working	26 (3.7%)
	Operators	11 (1.6%)
	Professionals	77 (11%)
	Services Industries	278 (39.7%)

3. Results

A reliability test was done to determine the internal consistency of the result measurements. It was used to evaluate the internal homogeneity among the items scale in this research. Values were all above the recommended cut-off of 0.70 (socio-cultural impacts = 0.70; economic impact= 0.82; environmental impact = 0.71; attitude= 0.76; practice= 0.74).

The results showed that these multiple measures are extremely reliable for measuring each construct (Ryu et al., 2008). Construct validity assesses the degree to which a measurement represents and logically connects, via the underlying theory, the observed phenomenon to the construct (McDaniel and Gates, 1993). In this study, there was acceptable convergent and discriminant validity among measurement items for study constructs.

Table 3 illustrates the correlation matrix of the study constructs. However, correlation does not imply cause and effect. Thus, it is not needed to assume that correlation equals causation and over interpret correlation coefficient. Results show the correlation coefficient which measures the strength of a linear relationship between two variables as follows: There are slight positive associations between the main constructs in the study. Results showed that correlation coefficient score was not more than 0.9 and there is not any multicollinearity problem among variables.

Table 3. Pearson-Correlation among Variables

Variables	Mean	S.D	Correlation				
			Socio-cultural Impact	Attitude	Environmental Impact	Economic Impact	Practices
Socio-cultural Impact	3.54	.440	1.000				
Attitude	3.55	.693	.401**	1.000			
Environmental Impact	3.35	.628	.349**	.286**	1.000		
Economic Impact	3.36	.710	.447**	.368**	.374**	1.000	
Practices	3.37	.548	.366**	.393**	.236**	.368**	1.000

**Correlation is significant at level 0.01(2 tailed)

Multiple Regression and Relationships among Study Variables

Equation results are illustrated in Table 4. These results demonstrate that socio-cultural impact, economic impact, and local community attitudes towards educational tourism were significantly associated with residents' practice towards the development of educational tourism in the Klang Valley. However, the four independent variables explicated approximately 24% of variance in community practice because the R^2-value was .237. There is little research that supports the effects of these independent variables and their relationship with community practice.

The findings showed that the sign of the coefficients of all independent variables are positive. Thus, there was a positive relationship between those certain variables and community practice towards educational tourism in Malaysia. Findings showed that the variance due to regression is enough greater than the variance due to residual noise to make the model {F (4, 695) = 53.835, ρ=.000}. Results indicated that among four variables, most of them had a significant association with the dependent variable (economic impact: β=.188, ρ=.000; socio-cultural impact: β=.172, ρ=.000; attitude: β=.244, ρ=.000). Only environmental factor was not significantly related with resident's practices towards educational tourism (β=.036, ρ=.328). The highest value of standardized coefficient in this column has the highest effect on the dependent variable. The coefficient of attitude was also greater than other independent variables' coefficient. This suggests that local community attitude to educational tourism has a greater influence on residents' practice and interaction with international students in the Klang Valley area.

Table 4. Regression Estimates of Equation (Enter Method)

			Regression coefficient			
Dependent Variable	Independent Variables	R (R^2)	Unstandardized	Standardized	Sig.	*t* value
Community Practice	Socio-Cultural Impact	.49 (.24)	.214	.172	.000	4.3708*
	Attitude		.193	.244	.000	6.515*
	Economic Impact		.145	.188	.000	4.812*
	Environmental Impact		.031	.036	.328	.979

* P<.001

{F (4, 695) = 53.835, ρ=.000}

4. Discussions

The main assumption of this study was that the local communities' attitude and the socio-cultural, economic, and environmental impacts of educational tourism have relationship with residents practice in educational tourism. The assessment of this statement was carried out among a sample of 700 adult Malays in the Klang Valley, Malaysia. The results of multiple regression analysis indicated that the relationship between community attitude, along with the socio-cultural and economic impacts of educational tourism with residents practice is statistically significant.

The results also showed that contacting with international students for residents in the Klang Valley take important place and help them to learn more about other cultures. In fact, the residents acknowledged the economic impact of international students on the Malaysian economy and the creation of more opportunities for local residents. Most previous studies in this field show that there is obviously an assumption that practices towards tourism involve tourism development and improve quality of life (Perdue, Long, and Allen, 1990; McCool and Martin, 1994; Andereck and Vogt, 2000). However, there is a lack of study relating to residents' awareness, attitude and practice to educational tourism.

Based on the results, the environmental impact of educational tourism did not have any significant influence on the local communities practice towards educational tourism. Nevertheless, this relationship appears to be confined to certain dimensions of community life related to public services such as public transport system and health care facilities in the area. It should be noted that the local government, tourism marketers, and entrepreneurs must focus on understanding the many different aspects of educational tourism in Malaysia. However, most of residents approved the positive impacts of educational tourism as a source of local community development for Malaysian residents. The fact that the local communities and their support is critical for the government's policies to educational tourism development.

For education tourism development, the study findings suggest that the international student numbers in Malaysian public and private higher education institutions relies not only on the quality of those institutions, but also to the impacts of educational tourism on the target region and residents. The study results proved that the relationship between the local communities' attitude, the socio-cultural, and economic impacts of educational tourism are important in pursuit of residents' practice in educational tourism development. In fact, factors such as more opportunities for local entrepreneurs, economic benefits to local people and small business, and employment opportunities may directly affect residents' interaction with international students in their neighborhood.

With regard to socio-cultural impacts like the quality of life, more cultural exchange between local residents and international students, the study

findings showed that local communities' practice was also influenced by those factors in the Klang Valley, Malaysia. In addition, residents' attitude was a main variable in relationship with their practice in educational tourism development. In other words, local communities' view towards Malaysia as an educational hub may specifically influence on their practice such as communication with students. Nevertheless, it is important to say that all individual characteristics of local residents such as age, education, occupation, income and their culture may be crucial factors in relationship with their practice towards educational tourism progress.

Limitations of the Study

The first potential limitation that should be recognized is related to multivariable regression analysis because it does not reflect all specific factors which may affect practice in educational tourism in Malaysia. An independent variable may be inaccurately fallen from an analysis since its coefficient is not found to be significantly different from zero; this may direct to an underestimation of dependent variable. Another possible limitation that should also be acknowledged relates to analysis of cross-sectional studies or the data may contain significant errors. Furthermore, despite the focuses on tourism development in Malaysia, there has been limited research performed specifically on educational tourism.

5. Conclusion

The aim of this study is to investigate factors affecting educational tourism development among local communities in the Klang Valley, Malaysia. The results showed that socio-cultural impact, economic impact, and local community attitudes towards educational tourism had a significant role in residents' communication with international students.

This study creates some methodological and conceptual contributions to the understanding of local community response to educational tourism development. To begin with, a multi dimensional questionnaire for educational tourism development was developed to measure residents' awareness and attitudes towards educational tourism in Malaysia. The results suggest that the instrument will be tested on other communities to ensure that it reacts appropriately in practice.

The development of the scale responds to the call for the concern of standardized instrumentation for practice in tourism research (Tyrrell and Spaulding; 1984 Crompton, 1990; Lankford and Howard, 1994). Additional testing of attitude with this scale will offer a more certain basis for comparative study of the nature and changing dynamics of resident attitudes toward tourism (Lankford and Howard, 1994).

Theoretically, this study supports previous studies in other aspects of tourism sector. However, additional analysis should be required for theory testing research beyond the scope of this paper. Additional insights can be attained through qualitative methods such as face to face interview with residents and the stake holders in charge for this segment of tourism.

Finally, results of this study present useful information for both Ministry of Tourism and Ministry of Higher Education on educational tourism for sustainable development programs and help residents to know about successful tourism marketing strategies. It also provides new insights for future tourism studies and community development.

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The Effect of Chemotherapy on Quality Of Life of Colorectal Cancer Patients before and 21 Days after the First Chemotherapeutic Sessions

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Abstract: Colorectal cancer and its treatment may cause adverse effects to the social function, including work and productive life, relationship with the family, partners and friends, and other interests and social activities, the disease and treatment impact to patients' well-being and functional results is a topic of growing interest for the colorectal cancer researches. Although improvements in treatment regimens have beneficially impacted the prognosis of colorectal cancer, several quality of life issues result from potential side effects of such aggressive treatment. This study aimed to assess the effect of chemotherapy on quality of life for colorectal cancer patients before the beginning and 21 days after the first session of chemotherapy. The study was carried out in outpatient of the Cancer Institute. The sample consists of 80 patients diagnosed as colorectal cancer, postoperatively and undergoing chemotherapy. The European Organization for Research and Treatment of Cancer-Quality of life Core-30 (EORTC QLQ-C30) questionnaire was used to assess patient's quality of life. Data were collected over a period of seven months started from September 2009 to March 2010. The results revealed that all symptoms dimensions except fatigue, and functional dimensions related to physical, role, and cognitive functioning as well as overall functioning was significantly decreased post the chemotherapeutic session. Conclusion and recommendation explained that; for the improvement of quality of life, patients with colorectal cancer undergoing chemotherapy should be included in program to help them find out adopt, and deal with function and symptoms complication of chemotherapy.
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Key words: Quality of Life; Chemotherapy; Colorectal Cancer.

1. Introduction

Cancer is a disease that affects people in the whole world and may bring some impacts to patients and families' lives in different ways, since the diagnosis acknowledgement until the treatment choice, its process, and the rehabilitation. Colorectal cancer, the third leading cause of cancer death worldwide, represents 10% of cancer diagnoses and deaths [(1)].More than 800,000 new cases are diagnosed annually, including 300,000 in the U.S. and Europe alone [(2)]. Estimated new cases of colorectal cancer in United States in 2012 are 103.170 while deaths are 51.690 [(3)].In Egypt, colorectal cancer is the 7th most common cancer with reported incidence of 1/100.000 cases [(4)]. An increasingly important issue in oncology is to evaluate quality of life in cancer patients [(5)]. The cancer-specific quality of life is related to all stages of the disease [(6,7)]. In fact, for all types of cancer patients general quality of life instruments can be used to assess the overall impact of patients' health status on their quality of life [(8)].

Health-related quality of life (HRQOL) is an important outcome of cancer therapy, currently; quality of life has been introduced as an endpoint for treatment comparisons on many cancer types, particularly in advanced stages[(9)]. Quality of life also, as an early indicator of disease progression could help the physician on daily practice to closely monitor the patients [(10)].In addition, quality of life may be considered to be the effect of an illness and its treatment as perceived by patients and is modified by factors such as impairments, functional stress, perceptions and social opportunities [(11, 12)]. According to the World Health Organization (WHO), quality of life is defined as individual perception of life, values, objectives, standards, and interests in the framework of culture. Quality of life is increasingly being used as a primary outcome measure in studies to evaluate the effectiveness of treatment[(13-16)].Colorectal cancer and its treatment may cause adverse effects to the social function, including work and productive life, relationship with the family, partners and friends, and other interests and social activities [(17)].

Physical and emotional integrity alterations, such as discomfort, pain, disfigurement, dependence and self-esteem loss are reported by patients who realize deep changes to their quality of life in a short-term [(18)]. The disease and treatment impact to patients' well-being and functional results is a topic of growing interest for the colorectal cancer researches. The main problems facing long-term cancer survivors are related to social/emotional support, health habits, spiritual/ philosophical view of life, and body image concerns [(17)]. Recently, several studies have been developed in order to assess such alterations in individuals' lives through the Quality of Life (QOL) and Health Related Quality of Life (HRQL) Assessments [(17-19)].Accurate assessment of

health-related quality of life in patients with advanced colorectal cancer is essential to improve our understanding of how cancer and chemotherapy influence patients' life and to adapt treatment strategies [20]. A range of factors influence health-related quality of life assessments, and they may vary according to each study, however, health-related quality of life may be considered having a great mental, physical and social function level, as well as real life position (social role), which includes relationships, health perception, abilities, satisfaction with life and well-being. They may also include assessments of the patients' satisfaction level regarding the treatment, results, health state, and future perspectives [21].

Currently, there are several therapeutic modalities for cancer treatment, such as: surgery (curative, palliative) chemotherapy, and radiation therapy, which may be used isolated or associated, and an increasing number of researches assesses the quality of life of colorectal cancer patients going through different treatment types[18,22,23]. When assessing the value of a particular treatment, it is important to consider the impact it may have on the quality of life of those being treated. This is particularly so for cancer patients, whose life expectancy may be short [24].The relationship between colorectal cancer risk and physical activity and dietary habits has been well-established, but less is known about the relationship between these behaviours and quality of life post-diagnosis. Moreover, it is unknown whether this relationship is consistent across cancer stage or treatment setting [25]. Although improvements in treatment regimens have beneficially impacted the prognosis of colorectal cancer, several quality of life issues result from potential side effects of such aggressive treatment. Consequently, shifting part of our focus in research and program development to address issues of quality of life and survivorship has become essential [26, 27]. Moreover, quality of life measurements are considered essential to assess the impact caused by the treatment to patients' lives.

Nurses, in their decision and actions, can influence their patient's quality of life. In addition, quality of life certainly has relevance of nursing; often patients consult nurse regarding how to obtain the best possible quality of life for themselves or for their family members. Moreover, quality of life is an important indicator of the success of nursing, medical, or health care intervention. Therefore, improving the health related quality of life for colorectal patients should be an interdisciplinary goal of physician, nurses; patients care technician, social worker and dietitians [28]. Focusing nursing intervention on decreasing chemotherapy treatment symptoms, or to improve the patient ability to deal with them, improving functional abilities, decreasing limitation and identifying issues that affect general health perception could increase a patient's overall health related quality of life[29].Because nurses and other health professionals are interested in the influence that health and illness have on quality of life, the evaluation of the positiveness or negativeness of attributes that characterize one's quality of life appears to be of pertinent value[30].

Aim of the study:

The study aim to assess quality of life, to identify the domains affected in colorectal cancer patients undergoing chemotherapeutic treatment and to examine the relationship between socio-demographic characteristics and quality of life and correlate them with the quality of life domains.

Research hypothesis:

1. Colorectal patients undergoing chemotherapy; will have higher scores of quality of life and global health status before chemotherapy than 21 days after.
2. Colorectal patients undergoing chemotherapy will have higher level of symptom or problems 21 days after first chemotherapeutic session than before.

2. Materials and Method:

Design:

The study was quasi experimental design.

Setting:

The study was carried out on outpatient of Cancer Institute affiliated to Ministry of Health. Tanta City.

Subjects:

A convenience sample of 80 patients diagnosed with colorectal cancer, post operatively, who attended the outpatient clinic for follow up and prior to the beginning of the first chemotherapeutic session.

Inclusion criteria:

Subjects were selected according to the following criteria: Adult, 18 years or older, both sex with colorectal cancer diagnosis, post operatively, for chemotherapy treatment, free from other chronic diseases, willing and able to communicate verbally and nonverbally, and have stable vital signs.

Exclusion criteria:

Subjects were excluded from the study if they had chronic disease such as renal failure, heart failure, diabetes mellitus, or hepatic failure, and if they had other types of cancer.

Tool of the study:

Quality of life interview questionnaire: It consists two parts:

Part one:

Related to patient's socio-demographic data which includes; age, sex, marital status, level of education, occupation and place of residence.

Part two:

This part was adapted to asses quality of life of colorectal patients using the quality of life questionnaire-C30 QLQ-C30 (Version 3.0) with functional/ symptom scale indicated [31]. QLQ-C30 has been found to be a valid, reliable and useful research tool for Egyptian culture, it is a health related quality of life questionnaire validated specifically for cancer

patients by the European Organization for research and treatment of cancer (EORTC). Its quality of life model is multi-dimensional and European Organization for research and treatment of cancer group defines it according to the central elements of the functional status, cancer and treatment specific symptoms, psychological distress, social interaction, financial impact, perceived health status and overall quality of life. It is comprised of both multi item scale and single item measures. These include 30 questions which cover five functional scales: physical, emotional, cognitive, social, and role functioning, a global health or overall quality of life, three symptom scales in order to measure fatigue, pain, nausea and vomiting, and five single items to assess symptoms such as: dyspnea, insomnia, appetite loss, constipation, diarrhea; and one single item which assesses financial difficulties. Each of the multi-item scales includes a different set of items, no item occurs in more than one scale.

Scoring system:

QLQ-C30 generates scores in the functional and symptoms scales. The principles of the scoring these scales is done as follow:

1. Estimating the average of the items that contribute to the scale; this is the raw score.
2. Using of the linear transformation to standardize the row score, each score is transformed in a scale from 0 to 100. According to EORTC guidelines, a high scale score represents a higher response level, thus a high score for a functional scale represents a high or healthy level of functioning, and high score for the global health status represents a high QOL, but a high score for a symptom scale items represents a high level of symptom or problems.

Method:

1. An official Permission to carry out the study was obtained from the responsible authorities.
2. Patient's written consent to participate in the study was obtained.
3. Patient's confidentiality was ascertained.
4. The original English language copy of EORTC scale was adoptive and modified by the researchers; it was tested for validity and applicability, necessary modifications were done.
5. The reliability of the interview questionnaire has been acceptable and was tested by using Cronbuch's Alpha test and it was greater than .70.
6. Patient who fulfilled the inclusion criteria was selected, and the purpose of the study was explained to each patient.
7. The interview questionnaire was conducted individually by the researchers for data collection twice:
   - Post operative and prior to the beginning of the first chemotherapeutic session.
   - 21 days after the first chemotherapeutic session.
8. The interview questionnaire lasts for 20-30 minutes with little clarification to some patient if needed.

Statistical analysis:

For categorical data the number and percentage were calculated. For calculating the difference in frequency of functions and symptoms before and after chemotherapy median, Interquartile range, mean rank and Wilcoxon signed rank test were used. The differences between median values were calculated for each dimension and the effect of different variables on this mean difference was tested using median, Interquartile range, mean rank, Mann- Whitney and Kruskal-Wallis Test. The level of significance was adopted at $p \leq 0.05$.

3. Results:

The subjects comprised of 80 patients attending outpatient clinic, Tanta Cancer Institute, with age ranged from 41-76 years. As for sex, more than half of the subjects were female (57.5%), and majority of them (92.5%) were married, while (40%) of them were housewives and illiterate, and only (12.5%) and (10%) of them were retired and have university level of education respectively. Regarding to place of residence, about three quarters of the subjects (72.5%) were from rural area.

Table (1): Total score of QOL items for colorectal cancer patient pre and 21 days post chemotherapy. In this table, it can be seen that the highest score of functioning dimensions before chemotherapy was related to role and cognitive functioning with a medium of 100.00 each and Interquartile range of 50.00, 20.00 respectively. The table also showed that functional dimension of QOL related to physical, role, and cognitive functioning as well as overall functioning was significantly decreased post chemotherapy with p value = 0.00 each, a negative rank of 40.64, 27.50, 42.15, 40.96 and positive rank of 13.50, 0.00, 21.5, 12.5 respectively. This table also shows that global health status was decreased post chemotherapy with a median of 66.67 and 50 and Interquartile range of 50.0, 33.33 before and after the chemotherapy respectively, although the decrease was not significantly with p = 0.135.

Concerning symptom dimension of QOL of colorectal cancer patients, the same table revealed that there was a significant increase in symptom dimension 21 days after the chemotherapy as related to pain, nausea and vomiting, diarrhea and constipation, dyspnea, insomnia, and anorexia and overall symptom with a median of 40.00, 0.00, 16.67, 57.97, and 57.02 respectively pre chemotherapy and 60.00, 66.67, 50.00, 72.46, 96.49 respectively post chemotherapy ,negative rank of 16.50, 0.00, 19.00, 26.89, and 6.00 respectively and a positive rank of 37.28, 38.50, 40.79, 40.59, and 42.32 respectively with p value = 0.00 each.

Table (2): Correlation between function, symptom, and global dimensions of QOL of

colorectal cancer patients. It is obvious that no significant correlation was found between function, symptom, or global dimensions of QOL of colorectal cancer patient since *p* value = 0.474, 0.836 and 0.638 respectively.

Table (3): Correlation between QOL items of colorectal cancer patients and their age pre and 21 days post chemotherapy. This table illustrate that, the only significant correlation of QOL items was found between role functioning and nausea and vomiting with patient age pre the first chemotherapeutic session with *P* = 0.031 and 0.047, respectively.

Table (4): Correlation between QOL items of colorectal cancer patients and their place of residence pre and 21 days post chemotherapy. From this table, it can be concluded that the only significant correlation was found between role functioning of QOL and patients from rural area pre chemotherapy with a median of 100.00, interquartile range of 25.00, a mean rank of 21.91 with *p*= 0.00.

Table (5): Correlation between QOL items of colorectal cancer patients and their gender pre and 21 days post chemotherapy. The table illustrated that, there was a significant correlation was found between female patients and physical function of QOL items pre chemotherapy with a mean rank of 44.67with *p*= 0.052, and global health status with a mean rank 46.11, 22.89 pre and post chemotherapy respectively with *p*= 0.010. For male patient the significant correlation was found between cognitive functioning and diarrhea and constipation pre and post chemotherapy with mean rank of 45.79, 48.15 in the pre and 21.12, 21.21in the post chemotherapy respectively with *p* = 0.053 and 0.007, respectively.

Table (6): Correlation between QOL items of colorectal cancer patients and their occupation pre and 21 days post chemotherapy. This table demonstrated that the there was a significant correlations were found between patient occupation and; role, emotional and cognitive functioning of QOL with *p*= 0.007, 0.022 and 0.002 respectively. In addition the same table shows that there was significant correlation was found between patient occupation and nausea and vomiting and diarrhea and constipation with *p*= 0.028 and 0.001, respectively.

Table (7): Correlation between QOL items of colorectal cancer patients and their level of education pre and 21 days post chemotherapy. In this table, the only significant correlation was found between physical functioning and patients education pre chemotherapy with a median of 60, 80, 60, 30 and Interquartile range of; 20,60, 20, 35 for illiterate, read and write, diploma and university level of education respectively with *p* = 0.001.

Table (1): Total score of QOL items for colorectal cancer patient pre and 21 days post first chemotherapeutic sessions

QOL Items	Pre		Post		Mean Rank (Post-Pre)		Wilcoxon Signed Ranks Test	
	Median	Interquartile Range	Median	Interquartile Range	Negative Ranks	Positive Ranks	Z	*P*-value
Function dimensions 1.Physical	60.00	35.00	20.00	20.00	40.643	13.500	-7.248	0.000
2.Role	100.00	50.00	50.00	50.00	27.500	0.000	-6.804	0.000
3.Emotional	12.50	25.00	12.50	25.00	21.700	19.300	-0.340	0.734
4.Social	0.00	29.17	0.00	33.34	28.083	28.813	-1.023	0.306
5.Cognitive	100.00	20.00	60.00	35.00	42.147	21.500	-6.755	0.000
Overall functions	-23.46	21.22	-50.46	23.15	40.959	12.500	-7.437	0.000
Symptom dimensions 1.Fatigue	85.84	39.34	92.99	39.34	35.429	33.850	-1.113	0.266
2.Pain	40.00	40.00	60.00	20.00	16.500	37.278	-5.897	0.000
3.Nausea& vomiting	0.00	29.17	66.67	33.33	0.000	38.500	-7.602	0.000
4.Diarrhea& constipation	16.67	33.33	50.00	0.00	19.000	40.794	-6.875	0.000
5.Dyspnea, insomnia& anorexia	57.97	28.98	72.46	28.98	26.885	40.591	-3.200	0.001
Overall symptoms	57.02	15.36	96.49	20.84	6.000	42.316	-7.667	0.000
Global health status	66.67	50.00	50.00	33.33	39.935	38.875	-1.496	0.135

Table (2): Correlation between quality of life dimensions of colorectal cancer patients pre and 21 days post first chemotherapeutic sessions

Correlations			
		Function dimensions	Symptom dimensions
Symptom dimensions	r	0.117	
	p-value	0.474	
Global Health	r	-0.034	-0.077
	p-value	0.836	0.638

Table (3) Correlation between quality of life dimensions of colorectal cancer patients and their age pre and 21 days post first chemotherapeutic sessions

QOL dimension	Age			
	Pre		Post	
	r	*P*-value	r	*P*-value
Function dimension 1.Physical	0.091	0.420	-0.04	0.78
2.Role	-0.241	0.031	-0.18	0.28
3.Emotional	-0.118	0.296	-0.11	0.50
4.Social	-0.110	0.331	0.01	0.94
5.Cognitive	0.034	0.762	-0.04	0.81
Overall functions	-0.134	0.237	-0.16	0.33
Symptom dimension 1.Pain	-0.012	0.916	0.05	0.76
2.Fatigue	-0.127	0.260	-0.09	0.57
3.Nausea and vomiting	0.222	0.047	-0.08	0.60
4.Constipation and diarrhea	0.026	0.817	0.05	0.77
5.Dyspnea, insomnia& anorexia	-0.003	0.981	-0.12	0.47
Overall symptoms	0.026	0.819	-0.07	0.65
Global health status	-0.193	0.087	0.29	0.06

Table (4): Correlation between quality of life dimensions of colorectal cancer patients and their place of residence pre and 21 days post first chemotherapeutic sessions

QOL Items	Residence	Pre		Mean rank	Post		Mean rank	Mann-Whitney Test (P-value)	
		Median	Interquartile Range		Median	Interquartile Range		pre	post
Function dimensions 1.Physical	Rural	60.00	30.00	20.48	20.00	20.00	40.397	0.947	0.99
	Urban	60.00	40.00	20.55	20.00	20.00	40.773		
2.Role	Rural	100.00	25.00	21.91	50.00	100.00	45.810	0.000	0.18
	Urban	50.00	50.00	16.77	0.00	50.00	26.500		
3.Emotional	Rural	12.50	31.25	19.19	12.50	25.00	38.845	0.291	0.24
	Urban	12.50	25.00	23.95	25.00	37.50	44.864		
4.Social	Rural	0.00	33.33	19.36	0.00	33.33	40.155	0.823	0.31
	Urban	0.00	16.67	23.50	16.67	33.33	41.409		
5.Cognitive	Rural	100.00	20.00	20.93	60.00	30.00	40.052	0.757	0.69
	Urban	100.00	40.00	19.36	60.00	60.00	41.682		
Overall functions	Rural	-23.46	30.86	19.84	-54.32	23.15	41.224	0.646	0.56
	Urban	-23.46	15.43	22.23	-38.89	23.15	38.591		
Symptom dimensions 1.Fatigue	Rural	85.84	42.92	20.36	85.84	35.77	38.603	0.228	0.90
	Urban	100.14	28.61	20.86	100.14	42.92	45.500		
2.Pain	Rural	40.00	40.00	19.07	60.00	20.00	38.776	0.260	0.19
	Urban	40.00	60.00	24.27	80.00	40.00	45.045		
3.Nausea& vomiting	Rural	0.00	16.67	20.91	66.67	33.33	39.259	0.321	0.71
	Urban	0.00	33.33	19.41	66.67	33.33	43.773		
4.Diarrhea& constipation	Rural	16.67	33.33	20.97	50.00	0.00	39.879	0.681	0.59
	Urban	16.67	33.33	19.27	50.00	0.00	42.136		
5.Dyspnea, insomnia& anorexia	Rural	57.97	28.99	21.17	72.46	14.49	39.603	0.560	0.54
	Urban	57.97	14.49	18.73	57.97	43.48	42.864		
Overall symptoms	Rural	57.02	15.35	20.59	96.49	19.74	38.741	0.264	0.94
	Urban	57.02	13.16	20.27	96.49	26.32	45.136		
Global health status	Rural	66.67	50.00	19.43	50.00	16.67	40.500	1.000	0.33
	Urban	50.00	50.00	23.32	50.00	66.67	40.500		

Table (5): Correlation between quality of life dimensions of colorectal cancer patients and their gender pre and 21 days post first chemotherapeutic session.

QOL Items	Sex	Pre		Mean rank	Post		Mean rank	Mann-Whitney Test (P-value)	
		Median	Interquartile Range		Median	Interquartile Rang		z	*p*
Function dimensions 1.Physical	Male	60.000	40.000	34.853	40.00	20.00	23.21	-1.939	0.052
	Female	80.000	20.000	44.674	20.00	20.00	18.5		
2.Role	Male	100.000	50.000	40.324	50.00	100.00	23.09	-0.069	0.945
	Female	100.000	50.000	40.630	50.00	0.00	18.59		
3.Emotional	Male	12.500	43.750	44.500	12.50	31.25	20.65	-1.351	0.177
	Female	12.500	25.000	37.543	25.00	12.5	20.39		
4.Social	Male	0.000	33.333	44.500	0.00	33.33	22.35	-1.375	0.169
	Female	0.000	16.667	37.543	50.00	0.00	19.13		
5.Cognitive	Male	100.000	20.000	45.794	60.00	30.00	21.12	-1.936	0.053
	Female	80.000	40.000	36.587	40.00	60.00	20.04		
Overall functions	Male	-23.457	19.290	45.088	-38.89	19.29	24.65	-1.539	0.124
	Female	-23.457	30.864	37.109	15.43	-54.32	17.43		
Symptom dimensions 1.Fatigue	Male	85.837	35.765	43.441	100.14	42.92	22.24	-0.990	0.322
	Female	85.837	42.918	38.326	28.61	85..84	19.22		
2.Pain	Male	40.000	40.000	41.912	60.00	30.00	21.03	-0.488	0.625
	Female	40.000	40.000	39.457	20.00	60.00	20.11		
3.Nausea& vomiting	Male	0.000	0.000	36.441	66.67	41.67	21.56	-1.718	0.086
	Female	0.000	33.333	43.500	33033	66.67	19.72		
4.Diarrhea& constipation	Male	16.667	25.000	48.147	50.00	0.00	21.21	-2.685	0.007
	Female	0.000	16.667	34.848	0.00	50.00	19.98		
5.Dyspnea, insomnia& anorexia	Male	57.971	28.986	43.500	57.97	28.99	15.68	-1.034	0.301
	Female	57.971	28.986	38.283	28.99	72.46	24.07		
Overall symptoms	Male	57.018	17.544	44.265	96.49	26.32	20.79	-1.267	0.205
	Female	57.018	13.158	37.717	17.54	96.49	20.28		
Global health status	Male	33.333	50.000	32.912	50.00	16.67	17.26	-2.571	0.010
	Female	66.667	33.333	46.109	33.33	50.00	22.89		

Table (6): Correlation between quality of life dimensions of colorectal cancer patients and their occupation pre and 21 days post chemotherapeutic session.

QOL Items			Occupation					Kruskal-Wallis Test	
			Housewife	Farmer	Employee	Free work	Retired	X2	*P*-value
Function dimension 1.Physical	Pre	Median	80	60	60	60		2.12	0.206
		IQR	60	40	20	55			
	Post	Median	20	20	20	40	40		
		IQR	20	20	20	30	30		
2.Role	Pre	Median	75	50		100	100	10.47	0.007
		IQR	50	50		37.5	75		
	Post	Median	0	0	50	75	0		
		IQR	50	50	50	50	50		
3.Emotional	Pre	Median	12.5	12.5	12.5	37.5	0	2.30	0.022
		IQR	39.563	39.929	36.375	65	31.3		
	Post	Median	12.5	0	18.75	25	0		
		IQR	25	25	43.75	28.13	31.25		
4.Social	Pre	Median	-8.333	0	8.333	-8.333	0	1.20	0.463
		IQR	16.667	16.667	29.167	29.167	25		
	Post	Median	0	0	0	-8.33	33.33		
		IQR	33.33	33.33	33.33	29.17	75		
5.Cognitive	Pre	Median	80		90	100	100	1.85	0.002
		IQR	40		35	45	30		
	Post	Median	60	60	60	40	60		
		IQR	35	20	30	45	40		
Overall functions	Pre	Median	-23.457	-23.457	-23.457	-15.741	-31.173	1.75	0.151
		IQR	28.935	23.148	21.219	28.935	27.006		
	Post	Median	-54.32	-46.60	-46.60	-42.75	-62.04		
		IQR	15.43	46.30	28.94	25.08	50.15		
Symptom dimensions 1.Fatigue	Pre	Median	78.684	85.837	85.837	78.684	71.531	6.65	0.569
		IQR	50.072	42.918	21.459	42.918	50.072		
	Post	Median	85.84	85.84	107.30	85.84	100.14		
		IQR	28.61	71.53	39.43	71.53	50.07		
2.pain	Pre	Median	40	20	40	50	40	0.67	0.503
		IQR	60	40	30	50	20		

	Post	Median	70	60	60	70	60		
		IQR	20	40	50	35	60		
3.Nausea& vomiting	Pre	Median	0	0		0	33.333	4.05	0.028
		IQR	33.333	16.667		25	33.333		
	Post	Median	66.67	66.67	83.33	75	83.33		
		IQR	33.33	33.33	45.83	29.17	41.67		
4.Diarrhea& constipation	Pre	Median	0	33.333	25	16.667	0	4.84	0.001
		IQR	16.667	16.667	45.833	25	50		
	Post	Median	50	50	50	41.67	50		
		IQR	0	0	0	29.17	25		
5.Dyspnea, insomnia& anorexia	Pre	Median	57.971	57.971	57.971	65.217	57.971	7.57	0.306
		IQR	21.739	43.478	28.986	25.362	36.232		
	Post	Median	72.46	57.97	72.46	43.48	57.97		
		IQR	10.87	28.99	28.99	32.61	57.97		
Overall symptoms	Pre	Median	57.018	57.018	63.596	65.789	57.018	7.20	0.531
		IQR	20.833	17.544	13.158	27.412	4.386		
	Post	Median	94.30	83.33	100.88	85.53	96.49		
		IQR	19.74	21.93	18.64	35.09	37.28		
Global health status	Pre	Median	66.667	33.333	66.667	50	50	2.08	0.068
		IQR	33.333	16.667	33.333	66.667	66.667		
	Post	Median	50	50	50	41.67	50		
		IQR	33.33	16.67	16.67	41.67	41.67		

Table (7): Correlation between quality of life dimensions of colorectal cancer patients and their education pre and 21 days post first chemotherapeutic session.

QOL Items			Education				Kruskal-Wallis Test	
			Ill.	R&W	Dip.	Univ.	X^2	*P*-value
Function dimensions 1.Physical	Pre	Median	60	80	60	30	16.979	0.001
		IQR	20	60	20	35		
	Post	Median	30.00	20.00	20.00	30.00	0.12	0.99
		IQR	20.00	20.00	20.00	50.00		
2.Role	Pre	Median	100	50	100	100	2.887	0.409
		IQR	50	50	50	37.5		
	Post	Median	50.00	0.00	50.00	50.00	1.86	0.60
		IQR	100.00	50.00	50.00	100.00		
3.Emotional	Pre	Median	6.25	12.5	12.5	18.75	5.32	0.15
		IQR	46.875	37.5	25	21.875		
	Post	Median	12.50	25.00	0.00	18.75	3.99	0.26
		IQR	25.00	37.50	25.00	12.50		
4. Social	Pre	Median	0	0	-16.667	0	3.459	0.326
		IQR	33.333	16.667	33.333	25		
	Post	Median	0.00	0.00	0.00	-8.33	1.03	0.80
		IQR	33.33	50.00	50.00	29.17		
5. Cognitive	Pre	Median	90	80	100	100	2.794	0.425
		IQR	35	40	20	30		
	Post	Median	60.00	40.00	60.00	60.00	3.22	0.36
		IQR	20.00	40.00	10.00	40.00		
Overall function	Pre	Median	-23.457	-15.741	-31.173	-31.173	4.471	0.215
		IQR	19.29	15.432	38.58	21.219		
	Post	Median	-50.46	-46.60	-54.32	-46.60	0.22	0.97
		IQR	23.15	23.15	30.86	44.37		
Symptom dimensions 1.Fatigu	Pre	Median	71.531	100.143	85.837	78.684	5.129	0.163
		IQR	25.036	57.225	21.459	53.648		
	Post	Median	100.14	85.84	71.53	85.84	7.38	0.06
		IQR	39.34	28.61	50.07	71.53		
2.Pain	Pre	Median	40	40	20	50	3.726	0.293
		IQR	35	60	50	35		
	Post	Median	70.00	60.00	60.00	70.00	0.55	0.91
		IQR	40.00	20.00	30.00	35.00		
3.Nausea& vomiting	Pre	Median	0	0	0	16.667	6.02	0.111
		IQR	33.333	0	25	33.333		
	Post	Median	66.67	66.67	83.33	66.67	1.24	0.74
		IQR	29.17	33.33	41.67	37.50		
4.Diarrhea& constipation	Pre	Median	16.667	16.667	0	8.333	1.526	0.676
		IQR	50	16.667	33.333	29.167		
	Post	Median	50.00	50.00	50.00	50.00	5.90	0.12
		IQR	0.00	0.00	33.33	25.00		

5.Dyspnea, insomnia& anorexia	Pre	Median	57.971	57.971	57.971	65.217	3.795	0.284
		IQR	28.986	0	36.232	47.101		
	Post	Median	72.46	72.46	72.46	65.22	0.56	0.91
		IQR	39.86	28.99	21.74	36.23		
Overall symptom	Pre	Median	57.018	57.018	57.018	67.982	2.236	0.525
		IQR	8.772	30.702	8.772	26.316		
	Post	Median	96.49	92.11	96.49	85.53	3.78	0.29
		IQR	21.93	21.93	21.93	43.86		
Global health status	Pre	Median	58.333	50	66.667	75	0.804	0.849
		IQR	50	66.667	41.667	54.167		
	Post	Median	50.00	50.00	50.00	33.33	3.40	0.33
		IQR	29.17	33.33	25.00	25.00		

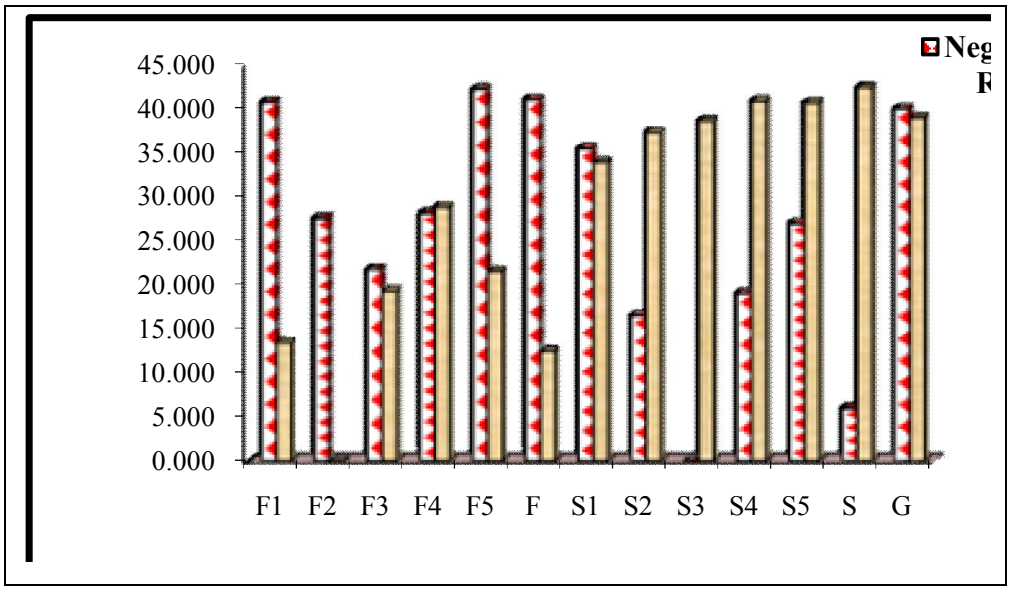

Figure (1) Quality of life dimensions of patients with colorectal cancer before and 21 days after the first chemotherapeutic sessions

4. Discussion:

Quality of life is an important issue for patients with colorectal cancer; accurate assessment of health related quality of life in patients with colorectal cancer is essential to improve our understanding of how cancer and chemotherapy influence patients, life and to adopt treatment strategies. The results of the present study proved that; for functional dimensions of QOL, physical, role, and cognitive functioning as well as overall functioning was significantly decreased post the chemotherapeutic session and the decreased wasn't significantly as related to emotional and social functioning, regarding symptoms dimension of QOL; the result of the present study also proved that; all symptoms dimensions was significantly decreased post the chemotherapeutic session except fatigue and the global health status wasn't significantly decreased after chemotherapy, this result in accordance with **Turgay et al (2008)** [32] who mentioned that all of the post chemotherapy mean scores from the quality of life instrument were statistically significant lower at day of 21 except for the cognitive functioning subscale and added that overall, initial chemotherapy was found to have a significantly negative effect on the quality of life of cancer patients**,** the result also in agreement with **Hurny et al (1996)** [33] who proved that chemotherapy had an measurable adverse effect on QOL in women with node positive operable breast cancer, also **Pagano et al (2008)** [34] added that chemotherapy is a treatment known to have a significant impact on QOL, moreover, **Arndt et al (2005)** [18] stated that there was statistically differences with cognitive function, pain, and appetite loss and the global health status was considered satisfactory. In contrast of the present study, **Conroy (2003)** [20] stated that more than half of the patients treated with palliative chemotherapy have an improvement or at least preservation of their health related quality of life, also **Bouvier (2008)** [35] mentioned that patient receiving adjuvant chemotherapy for colon cancer actually had better physical functioning than patient not receiving adjuvant chemotherapy, in addition, **Tsunoda et al (2009)** [36] added that overall health related QOL didn't deteriorate during adjuvant chemotherapy with colorectal cancer despite the

effect from surgical damage. Also the result of the present study was disagreed with **Dehkordi et al (2009)** [37] who stated that chemotherapy can lead to better sleep pattern in cancer patients and **Chen et al (2008)** [38] who found that QOL in lung cancer patients during the chemotherapy has been improved slightly over the baseline values, and **Heras (2009)** [39] who mentioned that fatigue intensity increased gradually during chemotherapy, also **Barras et al (2001)** [40]contradict this result and added that there was no differences between groups in quality of life at the initial assessment or once the treatment was completed and insomnia was the symptom with the highest impact on the quality of life.

According to the world health organization, QOL is defined as individual perception of life, values, objectives, standard, and interests in the framework of culture [23], the result of the present study shows that QOL domains which affected significantly by patient' age were related to; role functioning and nausea and vomiting, and also there was correlation between role functioning of QOL and patients from rural area which may be attributed by the fact that patient from rural area encountered travel related difficulties and transportation financial burden particularly during treatment as outpatients which may affect their role functioning, this result is in constant with **Kafa (2010)** [41] who found that there is a statistical significant correlation between age and psychological dimension of quality of life, in addition, **Kamal (2008)** [42] stated that the residency doesn't correlate with the indicies of quality of life and **Nicolussi et al (2009)** [43] found no correlation between QOL and age, gender, social status, marriage and job, moreover, **Dehkordi et al (2009)** [37] who mentioned that there was no correlation between QOL and variables such as age, sex, marital status duration of disease, economic condition and occupational function, also the result of the present study is in disagreement with **Mokabel (1997)** [44], **Bouvier *et al* (2008)** [35] who indicated that there was a weak correlation between age and quality of life domain.

The result of the present study illustrated that there was a significant correlation between female patient and physical and global health status where these domains are most affected and for male patient the significant correlation was found between cognitive functioning and diarrhea and constipation, this may be attributed to the fact that women are physically weaker than men and they are more affected by the dramatic effect of surgery as well as the side effect of the chemotherapy, these result is in agreement with **Schmidt (2005)** [45] who reported that global health status and physical functioning were significantly worse for women than for men also **Kafa (2010)** [41] found a statistical significant differences between sex and total score of physical functioning and psychological status. In addition **Nicolussi et al (2009)** [43] supported this result and added that lower QOL scores were observed among women specifically related to pain, insomnia, fatigue, constipation and appetite loss while men have reported better score in the emotional and cognitive function scale than women, on the other hand the result of the present study was in disagreement with **Dehkordi et al (2009)** [37], **Nicolussi et al (2009)** [43] who proved no correlation between QOL and gender.

In relation to occupation, the result of the this study showed that; occupation affects greatly and significantly role, emotional, and cognitive functioning post chemotherapy which may be explained by the fact that due to their disease and its treatment, patients are at leave from the work, away from home and family responsibilities which may affect their role, cognitive and emotional status, the result of the present study also showed that, for symptom dimensions of QOL, nausea and vomiting, diarrhea and constipation are most affected symptoms by occupation post the chemotherapy which may be explained that these symptoms are the most common adverse effect of chemotherapy. The result of the present study is in disagreement with **Uwer et al (2011)** [46] who found that there was no correlation between QOL and the type of job, and with **Kamal (2008)** [42] who stated that occupation as a patients' variable, hadn't correlate with the patients QOL.

In relation to level of education, the present study revealed that; only correlation was found between physical functioning and patients level of education, this result is in accordance with **Kamal (2008)** [42] who stated that level of education is not correlate with indices of QOL, **and Uwer et al (2011)** [46] and **Dehkordi et al (2009)** [37] who mentioned that no correlation was found between QOL and patients' educational level, in contrast to the finding of the present study, **Nicolussi et al (2009)** [43] mentioned that concerning educational level, patients who had completed superior education reported having more social difficulties of QOL.

Conclusion and recommendations

Conclusion: Based on the findings of the study, it can be concluded that:

- Most function dimensions of QOL for colorectal cancer patient significantly decreased post the first chemotherapeutic session.
- All symptom dimensions except fatigue and overall symptoms have been increased post the first chemotherapeutic session.
- No significant correlation was found between function, symptom, or global dimensions of QOL of colorectal cancer patient

- Role function affected by patients from rural area, female patients affected more than males as related to physical function and global health status.
- **Recommendations:** based on the findings of this study, it can be recommended that:
  - Nursing stuff should be encouraged to attend up to date scientific conferences and workshops related to improving QOL of cancer patients undergoing chemotherapy.
  - Patients with colorectal cancer for chemotherapy should be included in program to help them find out and adopt with function and symptoms complication of chemotherapy.
  - Using of different strategies to improve the patient ability to deal with function and symptoms complication of chemotherapy.
  - Integrate the quality of life of patient with chronic illness and cancer in nursing curriculum for under and postgraduate students.
  - Nursing curriculum should be directed towards the importance of nurse's role in different stages of cancer including diagnosis, treatment and rehabilitation.

(2) Recommendations for future studies:

- Further research is needed in this area for nursing staff to provide more comprehensive evaluation of quality of life for patients with cancer, patients who are receiving other complementary therapy for cancer treatment, and patient with non-operable cancer types.
- Development of strategy to help patients' improvement of their quality of life.

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Application of Fuzzy MCDM Techniques in evaluation and Ranking of Bank Branches Based on customer satisfaction Case study: Bank Branches of Mellat in Qazvin Province

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Abstract: Decision making is one of the most complex administrative processes in management. The purpose of this paper is to use the AHP and TOPSIS methods based on fuzzy sets for evaluation and Ranking of Bank Branches Based on customer satisfaction. From our research results, the "Done right and without interruption of service" and "Inform customers" are the most important factors for customers' satisfaction of Mellat Bank, also "Khayyam" and "Azadi" are the most successful Branches. This article is a very useful source of information both for bank managers and stakeholders in making decisions about Improve customer satisfaction. Other banks with other multi-attribute decision making techniques such as ELECTRE, PROMETHEE and ORESTE under fuzzy conditions can be done for further research.

[Ali Momeni, Mohammad M. Movahedi, Kiamars Fathi Hafshejani, Davood Gharakhani. **Application of Fuzzy MCDM Techniques in evaluation and Ranking of Bank Branches Based on customer satisfaction Case study: Bank Branches of Mellat in Qazvin Province.** *Life Sci J* 2012;9(4):3315-3321]. (ISSN: 1097-8135). http://www.lifesciencesite.com. 490

Keywords: AHP, TOPSIS, Fuzzy, MCDM, customer satisfaction, Mellat Bank

1. Introduction

For the last two decades, due to an increasingly competitive, saturated and dynamic business environment, retail banks in many countries have adopted customer-driven philosophies to address the rapid and changing needs of their customers.Customer satisfaction, since the early 1990s, has been a source of strategic competitive advantage for many companies worldwide. According to Westbrook and Reilly (1983) satisfaction is an emotional response to the experiences provided by, or associated with particular products or services delivered to customers, the purchasing process, as well as the purchase pattern and buying behavior of consumers. As satisfaction is a multidimensional concept, various definitions have been proposed, which, however, mainly refer to the fulfillment of customer expectations. Satisfaction is also considered to be a customer perception, which means that the specific information is not readily available (Grigoroudis and Siskos 2010). In the financial services sector, the relevance of customer analysis continues to grow (Lees et al., 2007), as provision of the service often requires interaction between the customer and the company's employees (Michel, 2004). Although banks try to provide error-free services, the service delivery process is complicated by simultaneous production and consumption. Consequently, service failures are quite frequent in the banking industry (Casado-Dı´az et al., 2007), with the subsequent reduction in customer satisfaction and, on occasions, customer complaint. Numerous research efforts have shown that the long-term business success is closely linked to the organization's ability to adapt to continuously differentiating customer preferences and needs (see for example Grigoroudis and Siskos 2010). The highly competitive environment in which banks operate, has led them to give more and more importance to the services they provide and to the efficient allocation of their available resources. Bank branches have indeed a crucial impact on the bank's operating system, since they are the intermediaries between the customer base and the banks themselves. In this context, Soteriou and Stavrinides (1997) argue that branch performance affects the bank directly and systemically.

The banking sector is heavily influenced by the changes in the economic environment and this customer orientation philosophy (see for example Grigoroudis et al. 2002). Banks and the entire financial services industry faced, particularly during the last two decades, a great number of major reforms, to which their adaptation was crucial. The new scene of the competitive environment led at length to radical strategic readjustments of the banks' role.

The measurement of customer satisfaction has witnessed dramatic growth over the last two decades (Walker et al., 2008). During this period, more than 15,000 scholarly articles and business reports have been published on the topic of customer satisfaction, and many researchers have attempted to develop theoretical and methodological frameworks to

measure customer satisfaction in a more reliable fashion (Meng et al,. 2008).

2. Literature Review

2.1. Customer Satisfaction

Most researchers agree that customer satisfaction refers to an attitude or evaluation formed by a customer comparing pre-purchase expectations of what they would receive from the product or service to their subjective perceptions of the performance they actually did receive (cited Drake et al., 1998). Measures of overall customer satisfaction typically capture consumer expectations towards the service provided, as well as how far the provided service is from their ideal (see Soderlund, 2006 Customer satisfaction is a fundamental determinant of long-term consumer behavior (Oliver, 1980; cited in Cooil et al., 2007). In order to control customer defection, most companies focus on managing customer satisfaction (cited in Cooil et al., 2007). Customer satisfaction has gained very much attention in the last few decades in all areas of production. In an increasingly competitive and dynamic environment, greater attention is continuously paid to customer relationships and satisfied customers (Eriksson and Vaghukt, 2000). The concept of satisfaction has been the subject of numerous controversies over the last 30 years. The current tendency is to define it as: A phenomenon that is not directly observable (a psychological state that must be distinguished from its behavioral consequences . . .) . . . an evaluative judgment . . . that results from cognitive processes and that integrates affective elements . . . a global judgment of a consumer experience . . . with a relative character, resulting from the fact that the evaluation is a comparative process between a consumer's subjective experience and an initial reference base . . . (Aurier and Evrard, 1998).

In addition, measuring customer satisfaction has several benefits for organisations:

- Improvement of communication between parties and enabling mutual agreement;
- Recognition of the demand of improvement in the process;
- Better understanding of the problems;
- Evaluation of progress towards the goal; and
- Monitoring and reporting accomplished results and changes.

2.2. Service quality in bank

The banking sector in Iran virtually remains one of the most significant drivers of economic activities after the oil industry. Amongst other factors, bank dissatisfaction typically stems from rising fees (Colgate and Hedge, 2001; Santonen, 2007), and customers usually switch banks to achieve more favourable prices (Farquhar and Panther, 2007). Improving customer satisfaction has been identified as one of the major challenges in the bank in the recent decade. A number of reports have highlighted the need for a change, greater efficiency and stronger client focus in the bank (Egan, 1998; Latham, 1994). According to Gro¨nroos (1990), customer-perceived service quality has two dimensions: the functional dimension (process), which denotes "how" in the customer-seller interaction and the technical dimension (outcome), which relates to "what" in the actual service provision. Evidence supports the notion that service management is concerned with not only the technical but also the functional quality (Kang, 2006). A significant implication of this similarity in offered products and services is that retail banks are no longer able to exclusively depend on their product and service offerings to gain a sustainable competitive advantage in the retail banking market (Walker et al., 2008). Thus, retail banks have come to realize the importance of differentiating themselves from their competitors on the basis of superior customer service (Beerli et al., 2004) and relying on effective defensive marketing strategies instead of the traditional offensive ones.

The conceptual definition of service quality developed by Parasuraman et al. (1988) has been largely employed for comparing excellence in the service encounters by customers. Bitner (1990) defined service quality as the customers' overall impression of the relative inferiority/superiority of a service provider and its services and is often considered similar to the customer's overall attitude towards the company (Parasuraman et al., 1998 this definition of service quality covers several points. One of them is an attitude developed over all previous encounters with a service firm (Bitner, 1990).

2.3. Effective Factors on customer satisfaction in bank services

To achieve the purpose of this study, a self-administered questionnaire was developed on the basis of an extensive review of the literature related to service quality and customer satisfaction in banking (e.g. Amin and Isa, 2008; Kassim and Souiden, 2007; Olorunniwo et al., 2006; Parasuraman et al., 1985 and 1988 The review of the extant literature on service quality initially led to the identification of an expanded list of 16 attributes as related to retail banking. However, due to its exhaustiveness and length, it was decided that this pool of attributes needed further inspection and shortening since each respondent as the approach employed in this study dictates would be asked to rate each attribute twice, once according to expectations and once according to perceived performance. At that stage, it was expected that such a length would be cumbersome and hence

would constitute a hindrance to drawing adequate responses from potential participants. Thus, four branch managers from different domestic banks in Iran were invited to participate in a focus group session for the purpose of selecting the most important attributes of the products and services that their banks deliver. The discussions of the focus group resulted in the selection of only 10 attributes out of the 16 identified at first. These attributes are shown in the list below.

- Fast service
-Bank location
-Courtesy of employees
-Done right and without interruption of service
-Inform customers
-Handling of complaints
-Appearance of staff
-Physical Facilities and Welfare Branch
- Appearance of branch
- Cleanliness of branch

2.4. Analytic hierarchy process

The AHP was developed by ThomasL.Saatyat the Wharton School of Business in 1970s. It is an effective decision-making technique based on multi-criteria decision-making methodology. The AHP is perhaps, the most widely used decision-making approach in the world and its validity is based on the many thousands of actual applications in which the AHP results were accepted and used by the cognizant decision makers .AHP is a method of breaking down a complex, unstructured situation into its component parts, arranging these parts or judgments on the relative importance of each variable and synthesizing the judgments to determine which variables have the highest priority and should be acted upon to influence the outcome of the situation (Saaty, 1990). It is a measurement theory that can deal with quantitative and qualitative criteria (Vargas, 1990).

Pairwise comparisons are basic to the AHP methodology. For pairwise comparisons, this paper uses the nine-point scale developed by Saaty (1980) and it is shown in Table 1. In the above original AHP scale, weak was subsequently changed to moderate and absolute changed to extreme. The intermediate values 2, 4, 6, and 8 are defined as weak or slight, moderate plus, strong plus, and very-very strong, respectively. When activities are very close, a decimal is added to the scale values to show their differences as appropriate, e.g. 1.1, 1.9, 2.1, 2.9, etc. According to Saaty (2008), assigning small decimals is a better alternative way to compare two close activities with other widely contrasting ones, favoring the larger one a little over the smaller one when using the one to nine values.

Table 1. Pairwise comparison scale

Intensity of importance	Definition	Explanation
1	Equal importance	Two activities contribute equally to the objective
3	Weak importance of one over another	Experience and judgment slightly favor one activity over another
5	Essential or strong importance	Experience and judgment strongly favor one activity over another
7	Very strong or demonstrated importance	An activity is very strongly favored over another. Its dominance is demonstrated in practice
9	Absolute importance	The evidence favoring one activity over another is of the highest possible order of affirmation
2, 4, 6, 8	Intermediate values between adjacent scale values	For use when compromise is needed
Reciprocals of above non-zero numbers	If the activity i has one of the above non-zero numbers assigned to it when compared with activity j, then j has the reciprocal value when compared to i	A reasonable assumption
Source: Saaty (1980)		

2.5. The fuzzy TOPSIS method

Hwang and Yoon developed the technique for order preference by similarity to ideal solution (TOPSIS) in 1981. TOPSIS has been widely used to rank the preference order of alternatives and determine the optimal choice. TOPSIS views a MADM problem with m alternatives as a geometric system with m points in the n-dimensional space. The method is based on the concept that the chosen alternative should have the shortest distance from the positive-ideal solution and the longest distance from the negative-ideal solution. TOPSIS defines an index called similarity to the positive-ideal solution and the remoteness from the negative-ideal solution. Then the method chooses an alternative with the maximum similarity to the positive- ideal solution (Wang & Chang, 2007). It is often difficult for a decision-maker to assign a precise performance rating to an alternative for the attributes under consideration. The merit of using a fuzzy approach is to assign the relative importance of attributes using fuzzy numbers instead of precise numbers. This section extends the TOPSIS to the fuzzy environment (Yang & Hung, 2007).This method is particularly suitable for solving the group decisionmaking problem under fuzzy environment.

Step 1: Determine the weighting of evaluation criteria
Step 2: Construct the fuzzy decision matrix and choose the appropriate linguistic variables for the alternatives with respect to criteria

Table 2 Linguistic scales for the importance of each criterion

Linguistic variable	Corresponding triangular fuzzy number
Very low (VL)	(0.0, 0.1, 0.3)
Low (L)	(0.1, 0.3, 0.5)
Medium (M)	(0.3, 0.5, 0.7)
High (H)	(0.5, 0.7, 0.9)
Very high (VH)	(0.7, 0.9, 1.0)

$$D = \begin{array}{c} \\ A_1 \\ \vdots \\ A_i \\ \vdots \\ A_m \end{array} \begin{bmatrix} x_1 & \cdots & x_j & \cdots & x_n \\ \bar{x}_{11} & \cdots & \bar{x}_{1j} & \cdots & x_{1n} \\ \vdots & & \vdots & & \vdots \\ \bar{x}_n & \cdots & \bar{x}_{ij} & \cdots & \bar{x}_{in} \\ \vdots & & \vdots & & \vdots \\ \bar{x}_{m1} & \cdots & \bar{x}_{mj} & \cdots & \bar{x}_{mm} \end{bmatrix}$$

Step 3: Normalize the fuzzy decision matrix

$$\tilde{x}_{ij} = (a_{ij}, b_{ij}, c_{ij}) \qquad \tilde{w}_j = (\alpha_j, \beta_j, \chi_j)$$

$$\tilde{r}_{ij} = \bar{x}_{ij}(/)x_j^+ = \left(\frac{a_{ij}}{c_j^+}, \frac{b_{ij}}{b_j^+}, \frac{c_{ij}}{a_j^+}\right)$$

$$\tilde{r}_{ij} = \bar{x}_j^-(/)\tilde{x}_{ij} = \left(\frac{a_j^-}{c_{ij}}, \frac{b_j^-}{b_{ij}}, \frac{c_j^-}{a_{ij}}\right)$$

$$\tilde{v}_{ij} = \tilde{r}_{ij}(\times)\tilde{w}_j = \left(\frac{a_{ij}}{c_j^+}, \frac{b_{ij}}{b_j^+}, \frac{c_{ij}}{a_j^+}\right)(\times)(\alpha_j, \beta_j, \chi_j) = \left(\frac{a_{ij}}{c_j^+} \times a_j, \frac{b_{ij}}{b_j^+} \times \beta_j, \frac{c_{ij}}{a_j^+} \times \chi_j\right)$$

$$\tilde{v}_{ij} = \tilde{r}_{ij}(\times)\tilde{w}_j = \left(\frac{a_j^-}{c_{ij}}, \frac{b_j^-}{b_{ij}}, \frac{c_j^-}{c_{ij}}\right)(\times)(\alpha_j, \beta_j, \chi_j) = \left(\frac{a_j^-}{c_{ij}} \times a_j, \frac{b_j^-}{b_{ij}} \times \beta_j, \frac{c_j^-}{a_{ij}} \times \chi_j\right)$$

Step 4: Determine the fuzzy positive-ideal solution (FPIS) and fuzzy negative-ideal solution (FNIS)

$$M(\upsilon_{ij}) = \frac{-a_{ij}^3 + c_{ij}^2 + a_{ij}.b_{ij} + c_{ij}.b_{ij}}{3(-a_{ij} + c_{ij})}$$

Step 5: Calculate the distance of each alternative from FPIS and FNIS

$$D_{ij}^- = 1 - \sup_x \left\{\min\left[a_{vij}(x), a_{vj^-}(x)\right]\right\}$$

$$D_{ij}^+ = 1 - \sup_x \left\{\min\left[a_{vij}(x), a_{vj^+}(x)\right]\right\}$$

Step 6: Obtain the closeness coefficient and rank the order of Alternatives

$$C_i^+ = \frac{S_i^-}{S_i^+ + S_i^-}$$

3. Research Methodology

The problem is the evaluation and Ranking of Bank Branches Based on customer satisfaction. For this reason, a two-phase AHP and TOPSIS methodology is used to realize the evaluation. For this purpose, the weights that are gained from AHP calculations are considered and used in TOPSIS calculations. Then TOPSIS is operated for the evaluation problem and the final ranking of the Bank Branches.

3.1. Sample

The target population of this study includes all customers of Mellat banks in Qazvin Province. Ideally, to make generalizations about such a population, one should start with a sampling frame from which a random sample would be drawn.We selected eight branches Between Mellat banks in Qazvin Province. These branches are: Khayyam, Takestan, Asad Abadi, Mohammadyeh, Bonyad, Valiasr, Azadi and Norouzian. However, due to the absence of the prospect for obtaining lists of existing customers and their contacts, a convenient sampling approach was followed as the best possible alternative. To ensure a high degree of representation of customers in the sample, it was decided to distribute as many questionnaires as available resources would permit and to reach customers in different locations. A total of 200 questionnaires were distributed. Out of these questionnaires, 100 were assessed as usable, establishing a response rate of (50 percent). The demographic characteristics of this study's participants are disclosed in Table 3.

Table 3. Demographic profile of sample

Profile	**n**	**%**
Gender	75	75
Male	25	25
Female		
Age		
18-30	42	42
31-50	48	48
51 or older	10	10
Education		
High school or less	7	7
Diploma	21	21
College graduate	28	28
Bachelor	30	30
master Graduate	12	12
PhD	2	2

90 percent of the participants were younger than 50 years. Most of the participants belonged to the college degree category.

4. Results

AHP and TOPSIS approaches were applied for data analysis. Expert Choice soft ware is used to calculating the exact weight of each factor. These scores reflect the importance of each of the specified attributes for the participants of this study As in Table 4. The results from AHP approach show that done right and without interruption of service is of the most important factor in customer satisfaction with weight of 0.2153. Inform customer is the second factor in customer satisfaction with weight of 0.1526. In summary, the attributes with the highest importance scores are done right and without interruption of service, inform customers, Courtesy of employees, Handling of complaints and Fast service.

Table 4. The weights and rank of factors Based on Customers Viewpoint (From AHP approach)

effective Factors on customer satisfaction	weight	Rank
Fast service	0.1321	5
Bank location	0.0412	7
Courtesy of employees	0.2034	3
Done right and without interruption of service	0.2153	1
Inform customers	0.1526	2
Handling of complaints	0.1116	4
Appearance of staff	0.0242	8
Physical Facilities and Welfare Branch	0.0652	6
Appearance of branch	0.0321	10
Cleanliness of branch	0.0223	9

This paper used from TOPSIS approach for selection of the best branch. The results from TOPSIS approach show that the branches with the highest importance scores are Khayyam, Azadi, Norouzian, Valiasr, Mohammadyeh, Bonyad , Takestan and Asad Abadi.The results shown in table 5.

Table 5. final rank of branches based on customer satisfaction

branch	Closeness coefficients	customer satisfaction	Rank
Khayyam	0.9843676	82.38	1
Takestan	0.3217654	51.66	7
Asad Abadi	0.2946754	49.59	8
Mohammadyeh	0.5643276	57.66	5
Bonyad	0.4875688	53.33	6
Valiasr	0.6382346	71.67	4
Azadi	0.7036535	79.66	2
Norouzian	0.6585642	73.33	3

5. Conclusion

The main purpose of this study is to identify the most important attributes that influence customer satisfaction in mellat banks and to determine the level of the overall satisfaction of the customers of these banks. The results of this study showed that the attributes with the highest importance scores are done right and without interruption of service, inform customers, Courtesy of employees, Handling of complaints and Fast service. Also The results from TOPSIS approach show that the branches with the highest importance scores are Khayyam, Azadi, Norouzian, Valiasr, Mohammadyeh, Bonyad , Takestan and Asad Abadi. Use of a two-phase AHP and TOPSIS methodology offers a number of benefits. First, it is a systematic and reliable method since it is capable of capturing an expert's opinions when complex MCDM problems are considered. Thus, the use of AHP weights in TOPSIS makes the benchmarking process more rational and realistic. Because of this ability, managers can use this method in making their strategic decisions. The combined AHP and TOPSIS method is very flexible and suitable for various decision situations. This article is a very useful source of information both for bank managers and stakeholders in making decisions about Improve customer satisfaction. Other banks with other multi-attribute decision making techniques such as ELECTRE, PROMETHEE and ORESTE under fuzzy conditions can be done for further research. Some limitations were inherent in the present study and are acknowledged here. First, data were collected from a convenient sample, implying that the generalizability of this study's results to the population of the customers of retail banks in Iran should be viewed with caution. Second, a self-administered questionnaire was used as a medium for data collection in this study. This method of data collection has been criticized for being inherently susceptible for the possibility of subject response bias. Third, only a small number of attributes related to the retail banking industry were selected in this study to measure the overall level of customer satisfaction. Several attributes can serve as candidates to be included in this study, and thus their inclusion might have led to different results.

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Relationship between Information & Communication Technology and Quality of Work-Life; A Study of Faculty Members of Zahedan University

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Abstract: Information and Communication Technology (ICT) is now common place in the university environment.ICT is an indispensable part of the contemporary world. The field of education has certainly been affected by the penetrating influence of ICT worldwide and in particular developed countries; ICT has made an impact on the quality and quantity of teaching, learning, and research in the traditional and/or distance education institutions using it. ICT enhances teaching and learning through its dynamic, interactive, flexible, and engaging content. It provides real opportunities for individualized instruction. Furthermore, ICT has the potential to accelerate, enrich, and deepen skills; to motivate and engage students in learning; to help relate school experiences to work practices; to help create economic viability for tomorrow's workers; contributes to radical changes in school; to strengthen teaching, and to provide opportunities for connection between the school and the world. But little research has addressed the impacts of ICT on the Quality of Work-Life (QWL) particularly on the work-life experiences in the university. Some researchers confirmed that ICT have negative impacts on QWL: Work becomes more intense, workers are displaced, surveillance increases, workers bargaining power declines, and workers skills become devalued. This paper will report on these issues from an initial analysis of baseline data gathered from a survey of faculty members in Zahedan universities. Findings showed that there is not a significant relationship between ICT using and QWL of faculty members.
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Key words: Information & communication Technology (ICT), Quality of work-Life (QWL), Faculty members

Introduction

ICT is increasingly into context of peoples every day life .ICT has the potential to improve the quality of life by providing new tools for improving access to information and knowledge management as sharing (Omona ,W. & Ikoja ,R. 2006).Technologies are expected to have a major impact on human life(UNESCO ,2000). Computers are increasingly widespread, influencing many aspects of our social and work lives, as well as many leisure activities. As more tasks involve human-computer skills and knowledge have become more positively correlated with both occupational and personal success. This means that all of community and human problems may solve better and easier through ICT. Technology is great key that social, cultural, political values have been changed (Isman, 2004).

Technology mainly refers to the new wave of ICT, including Internet-based communication and transaction systems, mobile devices, computer integrated telephony, groupware, workflow, multimedia, etc. Flexibility and technology are supposed to shape major trends in the evolution of quality of work and quality of life in the upcoming "information society" or "knowledge society" Kwache, P; (2007). ICT stands for information and technology and refers in principle to all technologies used for processing information and communicating .In most educational circles, it means computer technology, multimedia, and networking, especially the Internet. Some educators use the term "technology" or "information technology "instead; however, this appears to be changing to include ICT. The scope of ICT is dynamic and continuously changes with the creation of new technologies. At one time, technology referred only to hardware, now it includes software techniques as well (Voogt and kneszek, 2008). Ebadi (2005) defined "ICT as a collection of techniques, and tools to help us in reserving, processing, retrieving and receiving information. Penetration of the new ICTs in the universities and higher education centers has changed teacher-student interaction. Evolution and application of ICTs especially Internet lead to change all of traditional learning-teaching patterns from kindergartner to university. Internet, e-mail, interactive games and other victuals environments

are more a natural and intrinsic part of people lives. In the present digital era, the development in various aspects of computer technology has reached beyond our imagination and expectations. The rapid spread of computer and technologies throughout white-collar work has forced social scientists to consider the impact of these technologies on the people who use them directly and on the workforce, economy and educational settings(Rob kling,1989).Nowadays, ICT has focused on in vast context of educational systems in all processes(from inputs to outputs) and its aim is to facilitate and promote the quality of learning in the human. Therefore, this technology must employ accurately in teaching-learning process in all fields to proper and optimum application of procedures, methods and teaching strategies for promotion of teaching – learning quality in educational settings". The universal potential for each nation's development lies in its human capital. Regardless of status in the current world economy, regardless of natural resources or financial capital available ,and regardless of world positioning in the domains of ideas and innovation, there is a global understanding that nations become and remain strong through effective education systems that develop human capital –and in this era of globalization, through education systems that benchmark well worldwide. Increasingly, jurisdictions adopt standards for IT or ICT in schools and universities, particularly standards for ICT skills to be mastered by students and educators. ICTs skills standards are important defining achievement expectations for students and defining expected capabilities of educators. As the world becomes increasingly digital, and we experience the globalization of education, the important of these standards increases. Standards help to ensure that students complete their education prepared for the world of work and prepared to be contributing citizens, and standards help to ensure that teachers and school leaders are capable of taking advantage of IT to provide competitive education services (J.Voogt and G.Knezek, 2008). ICTs skills are necessary to use ICTs and learning technologies to improve learning, teaching, and school leadership. In the United States, Standards for students has developed by the International Society For Technology in Education(ISTE) specify foundation IT skills as well as skills necessary to learn effectively and live productively in an increasingly digital world(ISTE,2002a,b).

Some factors are affecting achievement of ICT potentials including:

1. Access to hardware, software, and communication resources, and
2. A classroom teacher who understands how to facilitate student learning through application of these resources. He/she must be skilled and expert in facilitation of technology-supported learning because he/she assumes responsibility for establishing the classroom environment and preparing the learning opportunities that facilitate student use of technology to research, learn, communicate, make decisions, and develop knowledge products. Therefore, all classroom teachers are prepared to provide their students with these learning opportunities. Both professional development programs for classroom teachers and preparation programs for future teachers must provide these standards-based, technology-rich experiences (J. Voogt, G. knezek, 2008).

Investment in ICT potentially has positive transformative effects on organizations (Mahmood & Mann, 1993) and societies (Carlaw, Lipsey, & webb 2007; Lipsey, Carlaw, & Bekar, 2005). With evolution of technologies, the communications and interactions methods have changed too and a new term as non –simultaneous communication has innovated which realized through Internet and World Wide Web(WWW) which thereby ,education has transformed extensively that we named them "distance learning", "distance teaching" ,"electronic teaching" and "electronic learning". Educational system has to move parallel to rapid change in using of ICT. ICT may displace jobs (Hector, 2003), change the structure of work (Rice & Gattikar, 2001), and threaten workers well-being (e.g., head, 2003). Researchers have trends to know whether the changes created by ICTs are ultimately good for workers (head,2003; Levy & Murane, 2004). In an age very much characterized by information technology (IT), there is a growing need to understand the ways in which ICTs affect human lives. In present, the axis of all technological development and activities are human resources. Then, it is a public belief that economic and educational development of a nation is depended on using ICT by human resources. Among today organizations, universities and higher education centers have pivotal role in improvement and development of personal and social lives. Universities are settings that number humans are working in them and have interaction with each other. If so, therefore these humans, who are working in the universities, have to become skillful and competent for completing their tasks. The employment conditions and existent climate in the universities affect quality of life (QOL) and QWL,

organizational commitment, university effectiveness and achievement to its mission. Enhancing QWL and QOL have long been majors explicit and implicit life-style and policy goal for individuals, communities, nations, and the world(Costanza et al,2007).A group of workforces that is greatly affected in QWL as a result of dynamic changes in work environment is IT(Guna,S. R. ,Maimunah ,I. 2008). Lau, Wong ,Chan and Law(2001) operationalized QWL as the favorable working environment that supports and promotes satisfaction by providing employees with rewards, job security , and career growth opportunities. Indirectly the definition indicates that an individual who is not satisfied with reward may be satisfied with the job security and to some extent would enjoy the career opportunity provided by the organization for their personal as well as professional growth.

The recent definition by Serey (2006) on QWL is quite conclusive and best meet contemporary work environment. The definition is related to meaningful and satisfying work. Some definitions indicate that QWL is a multi-dimensional construct, made up a number of interrelated factors that need careful consideration to conceptualize and measure. It is associated with job satisfaction, job involvement, motivation, productivity, health, safety and well-being, job security , competence development and balance work and non-work life as is conceptualized by European Foundation for the Improvement of Living conditions(2002). Surprisingly, however, little research has been preformed directly investigating the impact of ICT on workers well-being and QWL (Salanova, C. E., &Martin, 2004).In an age very much characterized by ICTs, there is a growing need to understand they ways in which ICTs change and affect human lives. With respects to the great efforts made in society to integrate ICTs into people's every day's lives, we regard it as necessary and important to take a closer look at ICTs in the faculty members lives. Some researchers have been by communication scholars about effects of ICTs on Organization (for a review, See Rice & Gattiker,2001) and worker well-being and QWL (Cheney.Zorn, Planap, & Lair, In press). However, there is a gap in our literature focusing on the effects of ICTs and its implementation on QWL. The focus of this study is relationship between ICTs on QWL in Faculty members and uses it in the work place. Our research question will be: Do Faculty members know or perceive that that QWL is improving or deteriorating as a result use or application of ICT in the work place? Then our foremost purpose with our work is studying the relationship between ICTs and QWL of faculty members.

Literature Review

It is difficult to find coherent and consistent theories in support for the study of such complex phenomenon as faculty members ICTs Use in their lives and every day work. There are many, different and to large extent contradictory ways of approaching the use of ICTs. In several small empirical studies it has been apparent that ICTs – rather that being interpreted as instrumental, functional and efficient – is understood as sensuous, experimental and perceptual (Skog & Soderlund, 1999).This is most clearly expressed in different forms of virtual environments where people meet, communicate and interact – where technology often is used in order to challenge the ordinary and the familiarity of everyday life. Focusing everyday life encourages the rich and manifold understanding of people's relationship to IT (Lie S, 1996). Faculty members have always had the pivotal role in the universities, thereby their university accreditation almost based on quality and quantity of faculty members and evaluated by them. Change in position and situation of faculty members have had significant impact on the structure of higher education centers. While they have easily access to teaching-learning resources, universities roles has changed. Teachers are no longer resource for lesson presentation in the classes, therefore, it is necessary that their new roles must be redefine based on using advanced ICT that it helps to promote teaching-learning process. Faculty members' tasks are categorized as following:

1. Curriculum planning, content selection and the method of material presentation.
2. Teaching: verbal presentation of materials to students.
3. Learning and directing the group discussion, they provide discussion and dialogue about planned materials and subjects.
4. Evaluation: planning and implementing of tests for evaluation of student learning. Extension of ICT affects of all four tasks in faculty members. With changes in ICT, Tasks of faculty members, kind of performance and the work situation will change and in turn, criteria for evaluation will change. The effects of ICTS changes on universities may be more than other social institutions, therefore for having good accountability to needs and new challenges, universities have to find new responsibilities. Universities have to maintain their role as "Science Center" in new globe. For realizing these issues, the universities and higher education centers have

to an active role in science production and its disseminating the science by using ICTs. No doubt, ICTs as powerful instrument will applied for increasing quality of higher education with maintaining economic aspects (Ghoorchian et al, 2005). The use of ICTs as teaching-learning tools is now rapidly expanding into education.(Liaw et al.,2006). ICTs have a range of important effects and impacts on the quality of life and work life through a number of means, some direct and some indirect (Tarafdar et al, 2007). Head (2003) has reported that ICTs use in contemporary organizations as inhumane and ultimately ineffective. He argues that manufacturing companies have ingrained practice of attempting to reduce reliance on skilled workers. ICTs may also complement worker skills, such as when an expert system becomes a "system for experts".

ICTs may increase the demand for some skills, such as computer programming as well as the need for expert thinking and complex communication (levy & Murnrne, 2004).

Negative Effects of ICT on QWL

ICTs enable increased monitoring and surveillance-especially real-time monitoring, versus after-the fact monitoring (head, 2003). Managers have for many years used after-the fact monitoring, such as investigating post-hoc the quantity of work completed or customers s satisfaction with worker service. Hence, contemporary technology enables real-time monitoring that makes monitoring easier, more comprehensive, and more intrusive. Some critics have argued that improved monitoring technologies have resulted in work intensification and accompanying pressure and stress (Green, 2004). Similarly, researchers have identified "Technostress" as consequence of ICT use and implementation (Tarafdar et al, 2007).Head (2003) argues that ICTS work in three ways:

1. They Substitute for skills.
2. They allocate and measure work that it leads to Task compression, where several tasks are brought together and performed by a single worker, and task separation.
3. They monitor work. In Sum, ICTs may diminish QWL by increasing surveillance of workers, devaluing and making less use of workers skills, intensifying work pressures, and reducing workers power.

Gattiker & Howg (1990) have performed a research about IT and QWL, they have argued that will simplify and deskill jobs, thereby reducing the QWL.

Positive Effects of ICT on QWL

Also, there is little research to confirm positive effects of ICT on QWL. Just, there is a reason to believe that ICTs may improve QWL in some cases. Axtell et al (2002) in their research have shown that when ICT creates more complex jobs, employees' job satisfaction increases.

ICTs facilitate the use of high involvement work practices (HIWPs), such as self-managed teams, employee involvement in decisions, multi-skilling workers , and flattening of hierarchies (Gollan, Davis, & Hamberger, 2005; Guthrie, 2001). ICTs enable HIWP by enabling workers to have access to information for decision-making and on-line training , but also because HIWP by are part of strategy of output flexibility and responsiveness to customers which is itself made possible by ICTs(Head,2003).

T. Zorn, Jr et al (2008) found that respondents who were affected by ICTs were more satisfied with their work roles and pay than those less affected. They explored that the work had become more pressured and more closely supervised by ICTs. Also, they explored that the more time people work on computers at home, they more perceive that they experience pressure in their work, increased pressure and remote work. In addition, those who spend more time working on computers at home have less satisfaction with workload and security.

More fine-grained analysis of the data is needed to tease out relationships among ICT use and QWL impacts. Green, F (2001, 2004), found that employees most affected by technology, saw their work as becoming more intense. Rob kling (1989) argued that some effects of technological change depended on when the technology was introduced. Improvements in mental health systems were larger for earlier introductions of the technology. Larger decreases in job variety and job challenge and small decreases in positive attitudes toward computers were observed in offices that introduced technology earlier. Also, he reported that technology decreased job satisfaction less and increased mental health more, decreased positive attitudes toward computer less.

Osterlund K. and K. Robson (2009) did a research about "The impact of ICTs on work-life experiences among university teaching assistants and their results suggested that there are some problems encountered in utilizing email in teaching work among teaching assistants. It seems that because they have little teaching experience and least secure teaching roles, relatively low prestige might render these workers more vulnerable to negative outcomes from email such as overwork,

unpaid time, stress, disrespect and emotional labor. Their results suggested that difficulties at the nexus of teaching/pedagogy and ICTs may be commonplace, and have a profile that varies across the different academic disciplines.

Schiller (2003) carried out a research about "Working with ICT: Perceptions of Australian principals. He found that most of principals (93.5) percent used computer at home with 86.6 percent of all principals computers connected to the schools network. 45 percent of principals have used Laptop computer at work. The main use for both their work and home computers was in word processing, sending and receiving e-mail and accessing the world Wide Web(WWW), whereas construction of spreadsheets, databases, and presentations(such as PowerPoint) was either "never' or "occasionally" used, either at home or at work. A research has done as titled; World Wide Web as a Means for developing of collaborative learning and teaching application by Tian(2001).He found that WEB is a valuable technology for facilitating of teaching development through Internet. Also, Brown (2001) in his research showed that Internet has positive effects on scientific creativity and productivity. Jaberi (1999) has performed a research as titled "Intelligent teaching with computer-assisted". He has concluded that intelligent teaching computer-assisted is preferred to traditional methods and it has leaded in increasing students' motivation. Showakhi (2003) found that Internet is used increasingly by faculty members, demand for Internet application is increasing and Internet utilization has penetrated in universities to the teaching environment (Lazings.1998). Little research has been done directly investigating the impact of ICT on faculty members' QOL and QWL (Salanova & Murnane, 2004). Some researchers have been by communication scholars about effects of ICTs on Organization (for a review, See Rice & Gattiker, 2001) and worker well-being and QWL (Cheney. Zorn, Planap, &Lair, in press). However, there is a gap in our literature focusing on the effects of ICTs and its implementation on QWL. The focus of this study is the effects of ICTs on QWL in Faculty members and uses it in the work place. Our research questions will be:

Do Faculty members know or perceive that that QWL is improving or deteriorating as a result Use or application of ICT in the work place?

Is there a relationship between ICTS utilization and QWL?

Then our foremost purpose with our work is studying the effects of ICTs on the QWL of faculty members.

Purpose

In order to answer the formulated research questions, the purposes of this study were to determine relationship between ICTs utilization and QWL and whether ICTs affected QWL in faculty members.

Implicitly, the research will determine whether are relationship between ICTs utilization and demographic variables (Gender, age, education area, academic paper, teaching experience, and official position).

Research and hypotheses

With regard of research purposes, a descriptive-correlation study was used to determine the relationship between ICTs using and QWL.

The population under investigation included faculty members in Zahedan universities who participated in our research during spring 2009.The sample was selected by classified randomized sampling proportional to the volume of 123 individuals.

A questionnaire with three sections was designed, which included demographic data, ICTs (Computer skills and Internet skills) and QWL questionnaire.

ICTs items included three- part: first part contained seven items about computer, second part contained six items and third part contained thirteen items about advantages and disadvantages for ICT. The questionnaire included a competency rating scale to determine perceived skills in use of ICT so that all participants could rate themselves on competencies such as use of word processing, Internet search engine, scanning a photo, using multimedia, prepare power point presentation. Questionnaire of QWL contained 23 items based on Likert five-point scale (5= strongly agree and 1= strongly disagree). The reliability of the Questionnaire for the components of ICT using and for QWL Questionnaire was determined as 0.91 and 0.82, respectively, by using Alpha Cronbach coefficient. Also, the face and content validity of questionnaires were determined by the opinions of experts and professors in ICT and Management. Data were analyzed at descriptive statistics (frequency, percentage, and mean) and inferential statistics (correlation Coefficient, variance analysis, and independent t-test) through SPSS statistical processes.

Results

Results showed that 70 percent of respondents were male and the most of respondents were 35-45 and the least of them above 45. Faculty members spend a lot of time working on their computer with 59.4 percent spending more than 20 hours per week and 25 percent spending between

5-10 hours on their office computer and about 70 percent indicating that they spend more than 10 hours per week on their home computer.

Although 39.6 percent indicated that they had International Computer Driving License (ICDL) skills. ICDL is divided into seven modules: Basic concepts of IT, Using the computer, File Management, word processing, spreadsheets, Databases, Presentations and Information &Communication (Dixie & Wesson, 2001). ICDL skills and about 54 percent had a good computer competency for filing, word processing, power point, and data saving. Faculty members saved students files, printed versions of attached files, who should take responsibility for filing them, and where to locate them for appropriate and easy access.

The findings showed that 46 percent of faculty members used internet more than 20 hours weekly and 23 percent used 5-10 hours weekly. Also, findings cleared that 92 percent entered data in Statistics software such as SPSS and Excel, while 40 percent used SPSS for data analyzing and 65 percent used excel for data analyzing. Many faculty members, 70 percent indicated that they used computerized equipments such as scanner, printer, digital camera or videolyzer and digital TV. In response to the question" How has learned about ICT skills (computer and internet skills)"? About 55 percent of faculty members stated that they have learned through self-training program and about 30 percent have learned during their education in the university. 40 percent of faculty members used Video conference for thesis viva and 30 percent of them used it for virtual classes. Accordingly, the application of ICT makes institutions more efficient and productive, thereby engendering a variety of tools to enhance and facilitate teachers' pedagogical activities. For instance, e-learning is becoming one of the most common means of using ICT to provide education to students both on and off campus by means of online teaching offered via web-based systems (Yusuf, 2005; Mutula, 2003).

Hypotheses 1 there is the significant relationship between components of ICT using and QWL of the faculty members.

Table 1 Results from correlation coefficient of components of ICT using and QWL of the faculty members

Analyzing of the results from the hypotheses indicated that the significant correlation coefficient between the ICT and the rate of QWL was not significant at the level of P≤ 0.05. The rate of correlation between two variables was r = 0.016. Analyzing of the results from the hypotheses indicated that the correlation coefficient between the Using of computer, Internet use, Law of copy write and Multimedia and QWL faculty members was not significant at the level of P≤ 0.05.

Table 2 Regression for predicting QWL of ICT using

Analyzing of the results from regression table showed Using of Computer, members. Finding showed there was not positive and significant relationship Internet, Copy write and Multimedia have little role in predicting QWL faculty between Computer, Internet, Copy write and Multimedia and QWL of faculty members.

Hyphotheses2- there is the significant difference between components of ICT using the faculty members in terms of demographic traits.

Table 3 F for ICT using faculty members in terms of demographic traits

According to the obtained results, the considered F did not show significant difference among the means of the rate of ICT using of the faculty members in Zahedan universities in terms of age, the teaching experience, field of academic and official post (P≤ 0.05). In other words, the rate of ICT using of the faculty members was equal in terms of age, field of academic, teaching experience and official post.

Table 4 T-test for ICT using in term of demographic traits

According to the obtained results, the considered t- test didnot show significant difference among the means of the rate of ICT using the faculty members of Zahedan universities in terms of degree and gender (P≤ 0.05). In other words, the rate of ICT using of the faculty members was equal in terms of degree and gender.

Hyphotheses3- there is the significant difference between QWL the faculty members in terms of demographic traits.

Table(5) F for QWL faculty member in term of demographic traits

According to the obtained results, the considered F did not show significant difference among the means of the rate of QWL the faculty members of Zahedan universities in terms of age, the teaching experience and field of academic (P≤ 0.05). In other words, the rate of QWL of the faculty members was equal in terms of age, field of academic and teaching experience. According to

the results, the considered F shows a significant difference among the means of the rate of QWL of the faculty members of Zahedan universities in terms of official post (P≤ 0.05). In other words, the rate of QWL the members of faculty were not equal to their scientific degree.

Table (6) T-test for QWL faculty member in term of demographic traits

According to the obtained results, the considered t- test didn't show significant difference among the means of the rate of QWL the faculty Members in Zahedan universities in terms of degree and gender (P≤ 0.05). In other words, the rate of QWL of the faculty members was equal in terms of degree and gender.

Discussion

One of the most important findings from this study is that faculty members spend a great deal of the working on their computer.

Faculty members spend a lot of time working on their computer with 59.4 percent spending more than 20 hours per week and 25 percent spending between 5-10 hours on their office computer and about 70 percent indicating that they spend more than 10 hours per week on their home computer. According to Schiller (2003) use of computer by principals were lowered than findings of this study. Increasing use of information and communication technology (ICT) means opportunities to cope with the trends demanding more flexible persons and organizations. ICT may give citizen to access to services almost 24 hours a day and offers thereby new opportunities for organizing and living every day life.(Albirini, A. 2006).Although 39.6 percent indicated that they had ICDL skills. And about 54 percent had a good computer competency only for filing, word processing, power point, and data saving. Faculty members saved students files, printed versions of attached files, who should take responsibility for filing them, and where to locate them for appropriate and easy access.

The findings showed that 46 percent of faculty members used internet more than 20 hours weekly and 23 percent used 5-10 hours weekly. Ninety three percent of government staff had access to internet in the work place in August 2006. (Statistics New Zealand, 2007) Also, findings cleared that 92 percent entered data in Statistics soft ware such as SPSS And Excel ,while 40 percent used SPSS for data analyzing and 65 percent used excel for data analyzing.

Data clearly demonstrated considerable variations in level of use of ICT. Some faculty members used only printer (%80). Many faculty members, 65 percent indicated that they used computerized equipments such as scanner, r, digital camera or videolyzer and digital TV.

The results of schiller (2003) showed that 35 percent of principals in his research have indicated never having used a digital camera or scanner. In response to the question" How has learned about ICT skills (computer and internet skills)"?

About 55 percent of faculty members stated that they have learned through self-training program and about 30 percent have learned during their education in the university. 70 percent of faculty members indicated that they have learned either through self-training program or education in their universities.

40 percent of faculty members used Video-conference for thesis viva and 30

Percent of them used it for Virtual classes. The results indicated that the significant correlation coefficient between the ICT and the rate of QWL was not significant (P≤ 0.05). May be, the reasons for lack of relationship between ICT and Qwl are: Low internet use due high engagement of faculty members in teaching and other official affairs, Low ICT facilities and culture using of ICT in these areas, and ICTs have not institutionalized well yet, therefore attitudes of faculty members with high and low status toward internet and ICT use is same. Also, the results indicated that the correlation coefficient between the Using of computer, Internet use, Law of copy write and Multimedia and QWL faculty members was not significant at (P≤ 0.05). There was not significant difference among the means of the rate of ICT using of the faculty members in terms of age, gender field of education, teaching experience and official status (P≤ 0.05). In other words, the rate of ICT using of the faculty members was equal in terms of age, field of academic, teaching experience and official post. The results demonstrated that using of Computer, Internet use, Copy write and Multimedia have little role in predicting QWL faculty members. Finding showed there was not positive and significant relationship between Computer, Internet, Copy write and Multimedia and QWL of faculty members. Whereas ICT enhances teaching and learning through its dynamic, interactive, flexible, and engaging content. It provides real opportunities for individualized instruction. Furthermore, information and communication technology has the potential to accelerate, enrich, and deepen skills; to motivate and engage students in learning; to help relate school experiences to work practices; to help create economic viability for tomorrow's workers; contributes to radical changes in school; to strengthen

teaching, and to provide opportunities for connection between the school and the world. The pervasiveness of ICT has brought about rapid technological, social, political, and economic transformation, which has eventuated in a network society organized around ICT (Yusuf, 2005).

Also, there was not significant difference among the means of the rate of QWL the faculty members of Zahedan universities in terms of age, the teaching experience and field of academic (P≤ 0.05). In other words, the rate of QWL of the faculty members was equal in terms of age, field of academic and teaching experience. About lack of relationship age ,gender and ICTs, it could say that existence of poverty , cultural frustration, deficit in economical-cultural supplies , racial prejudices , negative attitude toward using of ICT , maintenance of existence status , full time engagement in teaching process even many of them are going to other cities and universities for teaching and finally, lack of trust in buying through internet. According to the results, the considered F shows a significant difference among the means of the rate of QWL of the faculty members of Zahedan universities in terms of official post (P≤ 0.05). In other words, the rate of QWL the members of faculty were not equal to their scientific degree. It said that they have not access to high speed internet, lack of trends to use ICTs in research-educational activities, low trends to update their information through internet and they liked to maintain traditional educational system, Low mastery in English to search in different websites and upgrade their knowledge's.

Limitations

Several limitations are inherent within this study despite efforts to guard against threats internal, external, and statistical conclusion validity. The first limitation is the study doesn't encompass the entire faculty members in Zahedan Universities and does not investigate other faculty members in other cities of Iran that may offer different findings based on their setting. Second, this study is centred on the Zahedan universities and doesn't consider other universities. Third, beliefs, attitudes, and decisions are dynamic, therefore in this cross-sectional study may not fully capture the usage of ICT. Hence, the results of this study should be viewed as only preliminary evidence of the factors that influence ICTs utilization for improving QWL in faculty members. Furthermore, there is a necessity for further investigation and studies about effects and relationship between ICTs utilization and QWL to more robustly support the conclusion for this study.

Further research

The results of this study could be strengthened by including longitudinal data. This study focused on the relationship between ICT and QWL. Further researches suggest in other settings, universities and populations which using ICTs in their lives and workplaces. Organizational factors such as organizational and faculty members' culture, top-level management support, availability of resources and structures may also be factors influencing the ICTs usage and utilization in the work-lives of faculty members.

Table 1-Results from correlation coefficient of components of ICT using and QWL of the faculty members

variable	frequency	r	Sig.
ICT & QWL	123	0.016	**0.86**
Using of Computer and QWL	123	0.05	**0.58**
Internet and QWL	123	0.12	**0.014**
Law of copy write and QWL	123	0.034	**0.71**
Multimedia and QWL	**123**	**0.166**	**0.068**

Table 2-Regression for predicting QWL of ICT using

Variables	T value	B	Standard deviation	Significant level
Constant	10.88	62.65	5.757	**0.000**
Using of Computer	-0.91	-0.22	0.238	**0.928**
Internet	0.821	0.286	0.35	**0.413**
Copy write	-0.40	-0.217	0.54	**0.688**
Multimedia	**1.965**	**1.537**	**0.78**	**0.052**

Table 3-F for ICT using faculty members in terms of demographic traits

Variables	df	F	Significant level
Age	93	0.501	**0.607**
Teaching experience	91	1.32	**0.267**
Field	117	0.26	**0.772**
Official post	**87**	**0.57**	**0.64**

Table4- T-test for ICT using in term of demographic traits

Variables	df	t	Significant level
Degree	102	1.2	**0.23**
Gender	**102**	**1.6**	**0.113**

Table 5. F for QWL faculty member in term of demographic traits

Variables	df	F	Significant level
Age	93	1.32	**0.267**
Teaching Experience	91	0.587	**0.673**
Field	87	2.04	**0.114**
Official Post	**117**	**3.86**	**0.024**

Table 6 T-test for QWL faculty member in term of demographic traits

Variables	df	t	Significant level
Degree	102	-O.718	0.474
Gender	102	0.495	0.622

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cPrevalence of (25) Vitamin - D Deficiency among Premenopausal Women Working In Fayoum University

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Abstract: Vitamin - D deficiency is a worldwide problem and the prevalence of deficiency reaches more than 50% of the population in most of the studies and causes of deficiency are either inadequate intake of food containing vitamin - D or inadequate exposure to sun light which plays an important role of biosynthesis of vitamin- D from the skin, vitamin -D deficiency is linked to many diseases like cancer, diabetes, bone disorders, hypertension, obesity, dyslipidemia and many other disorders and correction of 25 -vitamin - D deficiency which is very simple and available and not expensive improves those disorders significantly. **This work aimed to** screening for vitamin 25- D deficiency among premenopausal women working in Fayoum University. **Subjects and methods**: two hundred healthy premenopausal non pregnant non lactating females aged 40-50 years old working at Fayoum University, subjected to thorough medical history and clinical examination, stressing on color of the skin BMI and style of clothing and all patients are screened for 25- vitamin D using ELISA. **Results**: Our results showed that 45 females of 200 were sufficient (22.5%), 91 females were insufficient (45.5%), 64 females were deficient (32%). Vitamin D deficient females subdivided into deficient (82.8%) and severely deficient (17.2%). there was significant difference between the mean of vitamin -D in the different BMI, in normal body weight subjects the mean of vitamin D level was 77.9 ± 21.7 in overweight was 51.4 ± 15.5 in obese (40 ± 22.4) and the difference is highly statistically significant ($p < 0.001$). The mean vitamin -D level for western wearing clothes was 66.8 ± 16.4, for ladies wearing Higab was 62 ± 23.2), and for ladies wearing Niqab 28.3 ± 16.3 and the difference is highly statistically significant ($p < 0.001$). The mean of vitamin D level in dark skinned subjects was 57.2 ± 21.2 while in white skinned subjects was 96.2 ± 33.8 and the difference is highly statistically significant ($p < 0.001$)**. Conclusion:** More than 75 % of the premenopausal women working in Fayoum University had either vitamin –D deficiency or insufficiency. obesity, darker skin and insufficient sun exposure are the main factors leading to or associated with 25 – vitamin - D deficiency

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Key words: Vitamin- D – Deficiency - Skin color - BMI - Diet - Sun exposure

1. Introduction:

Vitamin D deficiency is a growing worldwide problem with many health consequences (Michael and Tai, 2008).

It is an increasing prevalent disease in many areas all over the world such as: in United States 41.6% (Forrest and Stuhldreher, 2011), in Australia 67.3% (van der Mei *et al.,* 2007), in China 69.2% (Lu *et al.,* 2009), in India 66.3% (Arya *et al.,* 2004), in Germany 58% (Hintzpeter *et al.,* 2007), in Morocco 90% (Allali *et al.,* 2009), in Tunisia 47.6% (Meddeb *et al.,* 2005).

Vitamin D deficiency may be due to reduced skin synthesis as a result of inadequate exposure to sunlight, decreased bioavailability as in malabsorption and obesity, decreased activation as in hepatic and renal failure, increased catabolism due to some drugs (Anticonvulsants, glucocorticoids) and breast-feeding (Michael and Tai, 2008).

Vitamin D deficiency was found to be linked to many diseases such as: osteoporosis (Bell *et al.,* 2010), multiple sclerosis (Munger *et al.,* 2006), autoimmune diseases (Kriegel *et al.,* 2011), SLE (Azza *et al.,* 2011) influenza (Cannell *et al.,* 2006), tuberculosis (Nnoaham and Clarke, 2008), connective tissue-associated interstitial lung diseases (Hagaman *et al.,* 2011), HIV (Mehta *et al.,* 2010), high blood pressure and cardiovascular risk (Pittas *et al.,* 2010), peripheral artery disease (Melamed *et al.,* 2008), type 1 diabetes mellitus (Holick, 2005), cancers: colon, breast, ovarian and pancreatic cancers (Garland *et al.,* 2006) and increased mortality (Michaëlsson *et al.,* 2010).

Aim of the work

The aim of this work is screening prevalence of vitamin D deficiency among healthy premenopausal females aged 40-50 years old working at Fayoum University.

2. Subjects & Methods

Cross sectional study for two hundred healthy premenopausal females aged 40-50 years old working at Fayoum University.Exclusion criteria are, post menopausal females, pregnant & lactating females. Vegetarians, presence of mal-absorption disorders like Crohn's disease, celiac disease and cystic fibrosis, presence of any endocrinal disorder, presence of renal and hepatic disorders.

All subjects will be subjected to full history and clinical examination stressing on the color of the kin, body mass index and style of clothing either western style or if Hijab or Niqab is used. Liver and kidney functions. estimation of serum 25-hydroxyvitamin D using ELISA technique.

Statistical analysis

Collected data were computerized and analyzed using Statistical Package for Social Science (SPSS) version 16. Descriptive statistics were used to describe variables; percent, proportion for qualitative variables. Mean, SD, range for Quantitative variable. Comparison between groups was done using chi-Square test for qualitative variables, independent t- test and ANOVA test for quantitative variables. Pearson correlation was done between two quantitative variables to test association between variables. *p* values with significance of less than 5% were considered statistically significant.

3. Results

This study included 200 healthy premenopausal females between 40-50 years old, working at Fayoum University.

Demographic data of study group:

Study subjects divided into groups according to their BMI, color of skin and style of their clothes.

As shown in table (**1**), 76 out of the **200** females were of normal weight (**38%**), **93** females overweight (**46.5%**), **31** females obese (**15.5%**).

Table (1): Showing number and percent of different BMIs of study group. (Normal weight 18.5–24.9, overweight 25–29.9, obesity ≥ 30.)

BMI	Number	Percent
Normal	76	38%
overweight	93	46.5%
Obese	31	15.5%
Total	200	100%

Table (2): Showing frequency and percent of different color of skin of study group.

Color of skin	Number	Percent
Dark	187	93.5%
White	13	6.5%
Total	200	100.0%

As shown in table **2**, 187 out of the **200** females, **187** (**93.5%**) were of dark skin color and **13** (**6.5%**) had white color.

As shown in table **3**, 174 out of the **200** females, were wearing higab **(87%), 15** wearing niqab (**7.5%), 11** wearing western clothes **(5.5%).**

As shown in figure **1**, prevalence of vitamin D deficiency in the study group was as follow: **45** females out of **200** were **sufficient (22.5%)**, **91** females were **insufficient (45.5%)**, **64** females were **deficient (32%).**

Vitamin - D was considered insufficiency if serum 25(OH) D levels are between **20** and **29.99** ng/ml (**50**nmol/L and **74.99**nmol/L), deficiency below **20**ng/ml (**50**nmol/L), and severe deficiency below **10**ng/ml (=**25**nmol/L)

As shown in figure **2**, vitamin -D deficient females subdivided into deficient (**82.8%**) and severely deficient (**17.2%**).

As shown in figure **3**, there was significant difference between the mean of vitamin -D in the different BMI, in normal body weight subjects the mean of vitamin D level was **77.9 ± 21.7** in overweight **51.4 ± 15.5** in obese (**40 ± 22.4**) with statistically significant ($p < 0.001$).

As shown in figure **4**, the mean vitamin -D level for western wearing clothes was **66.8 ± 16.4**, for ladies wearing Higab were **62 ± 23.2**, and for ladies wearing Niqab were **28.3 ± 16.3**, with statistically significant ($p < 0.001$).

As shown in figure **5**, mean of vitamin D level in dark skinned subjects was (mean ± SD = **57.2 ± 21.2**), while in white skinned subjects was **96.2 ± 33.8**, and the difference is highly statistically significant ($p < 0.001$).

As shown in table (**4**), BMI, clothes and color of skin were significant predictors for vitamin D deficiency with significant $p < 0.005$.

Table (3):Showing frequency and percent of different styles of clothes of study group

.Style of Clothes	Number	Percent
Higab	174	87%
Niqab	15	7.5%
Western	11	5.5%
Total	200	100%

Table (4): Multiple linear regression model to show predictors of vitamin -D values
(Dependent Variable: Vitamin -D (nmol/ml)

Model	Un-standardized Coefficients		Standardized Coefficients	t	*P* value
	B	Std. Error	Beta		
(Constant)	68.9	7.5		9.1	.000
BMI	-23.7-	2.6	-.476-	-9.1-	.000
Clothes	-26-	4.7	-.284-	-5.6-	.000
Color of skin	29.1	5	.298	5.8	.000

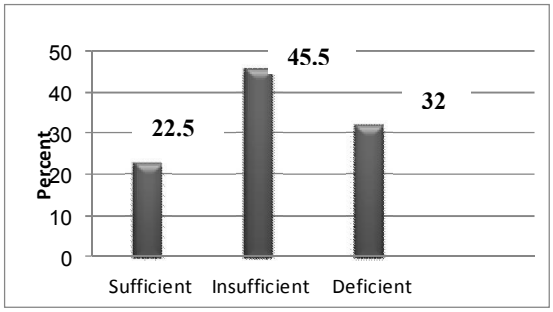

Figure (1): Showing values of vitamin -D in the studied group:

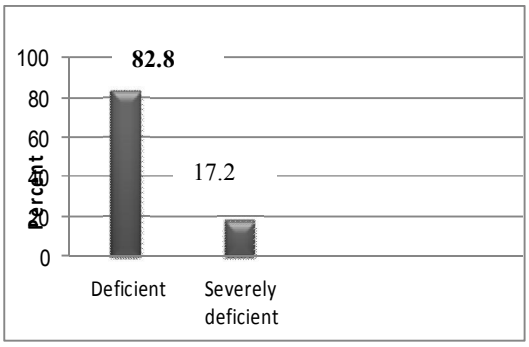

Figure (2): Showing percent of vitamin D deficient group:

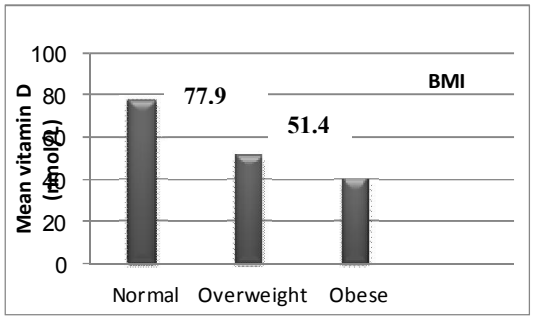

Figure (3): showing relation between BMI and mean of vitamin.D:

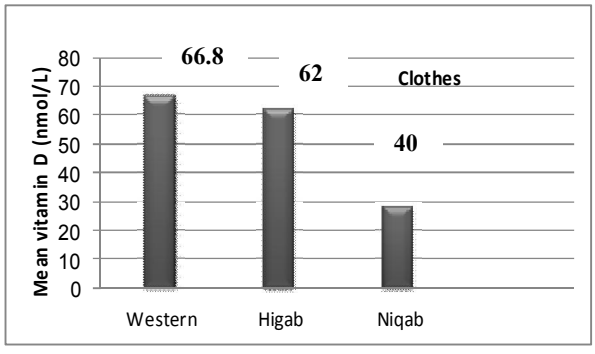

Figure (4): showing relation between different styles of clothes of study group and mean of vit D:

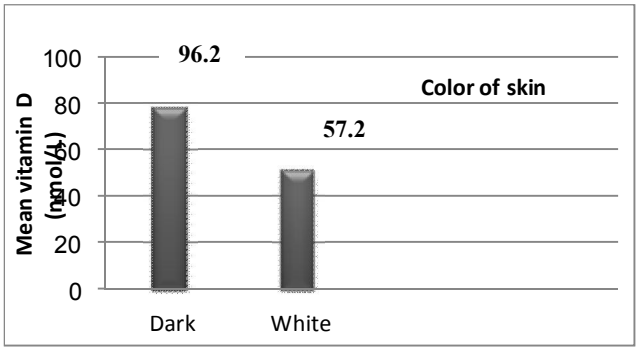

Figure (5): showing relation between color of skin and mean of vitamin D:

4. Discussion

Vitamin D insufficiency has been defined as a 25(OH) D concentration of 50–75nmol/L (20–30ng/ml) (The Endocrine Society, 2011). Vitamin D deficiency can be further classified as mild 25–50nmol/L (10–20ng/ml), moderate 12.5–25nmol/L (5–10ng/ml), and severe <12.5nmol/L (5ng/ml) (Stroud *et al.,* 2008). Recently hypo-vitaminosis D includes three categories according to cutoff values: insufficiency if serum 25(OH) D levels are between 20 and 29.99ng/ml (50nmol/L and 74.99nmol/L), deficiency below 20ng/ml (50nmol/L), and severe deficiency below 10ng/ml (25nmol/L) (Pérez-Lopez *et al.,* 2011).

Many factors can explain the high prevalence of vitamin -D deficiency, homebound individuals, women who wear long robes and head coverings for religious reasons, and people with occupations that limit sun exposure are unlikely to obtain adequate vitamin D from sunlight (Institute of Medicine, 2010). Greater amounts of the pigment melanin in the epidermal layer result in darker skin and reduce the skin's ability to produce vitamin D from sunlight, various reports consistently show lower serum 25(OH) D levels in persons identified as black compared with those identified as white (Institute of Medicine, 2010). As a fat-soluble vitamin, vitamin D requires some dietary fat in the gut for absorption. Individuals who have a reduced ability to absorb dietary fat might require vitamin D supplements. Fat malabsorption is associated with a variety of medical conditions including some forms of liver disease, cystic fibrosis, and Crohn's disease (Holick, 2006).

in this study we aimed to get an idea if the prevalence and possible relevant etiological factors for vitamin (25) –D deficiency. Two hundred healthy premenopausal non pregnant non lactating females aged 40-50 years old working at Fayoum University, subjected to thorough medical history and clinical examination, stressing on color of the skin, BMI and style of clothing and all patients are screened for 25-vitamin- D using ELISA.

Our results showed that 45 females of 200 were sufficient (22.5%), 91 females were insufficient (45.5%), 64 females were deficient (32%). Vitamin D deficient females subdivided into deficient (82.8%) and severely deficient (17.2%). there was significant difference between the mean of vitamin -D in the different BMI, in normal body weight subjects the mean of vitamin D level was 77.9 ± 21.7, in overweight 51.4 ± 15.5), in obese (40 ± 22.4) and the difference is highly statistically significant ($p < 0.001$). The mean vitamin -D level for western wearing clothes was 66.8 ± 16.4 for ladies wearing Higab 62 ± 23.2), and for ladies wearing Niqab 28.3 ± 16.3), and the difference is highly statistically significant ($p < 0.001$). The mean of vitamin D level in dark skinned subjects was 57.2 ± 21.2 while in white skinned subjects was 96.2 ± 33.8 and the difference is highly statistically significant ($p < 0.001$).

Vitamin D status has been studied on all continents and in most countries throughout the world. In total, approximately 5,060 epidemiological studies have been done according to a Pub Med search conducted in February 2012. These studies revealed that vitamin D deficiency was prevalent across all age-groups, geographic regions, and seasons (Michael, 2012).

Investigators have reported that in women being administered medications to treat diagnosed osteoporosis, 37% of those in Sweden, 75% of those in the United Kingdom, 68% of those in Germany, 52% of those in the Netherlands, 50% of those in France, 63% of those in Switzerland, 56% of those in Hungary, 65% of those in Spain, 77% of those in Turkey, 85% of those in Lebanon, 92% of those in South Korea, 90% of those in Japan, 47% of those in Thailand, 49% of those in Malaysia, 67% of those in Mexico, 42% of those in Brazil, 50% of those in Chile, and 60% of those in Australia exhibited serum 25-OHD3 concentrations lower than 75nmol/L (Michael, 2012).

In a survey conducted in the central United States, it was found that 67% of women without health insurance exhibited serum 25-OHD concentrations lower than 50nmol/L (Kakarala *et al.,* 2007).

In the Canadian Health Measures Survey (n = 5306), Overall, 5.4%, 12.7%, and 25.7% of the participants had 25(OH) D concentrations below the 30, 40, and 50nmol/L respectively. (Susan *et al.,* 2011).

In Australia, almost one-third of adults over the age of 25 have a Vitamin D deficiency, in a new study from the University of Melbourne. The study involved 11,218 Australians. The overall prevalence of vitamin D deficiency was 31%, with Australian women being more commonly affected (39%, in contrast with 23% in Australian men,) (Daly *et al.,* 2012).

In this study we only screened premenopausal women but in another study done in Egypt, also a random sample of 120 (90 females and 30 males) apparently healthy undergraduate students, Zagazig, Sharkia, were enrolled in cross sectional study, mean serum 25(OH) D level was 23.7 ± 12.681ng/ml using a cutoff point of 30ng/ml, 74.6% of sample (61.7% males and 79.2% females) had low vitamin D status (Maggie *et al.,* 2012).

Despite ample sunshine, vitamin D deficiency is very common in the Middle East and African countries (Alshishtawy, 2011).

The first study to reveal low vitamin D concentrations in people of the Middle East region was conducted by Woodhouse and Norton in 1982 among ethnic Saudi Arabians (Woodhouse and Norton, 1982).

Their results were confirmed in 1983, when Sedrani et al. recorded a mean 25(OH) D concentration ranging between 10–30nmol/L among Saudi university students and the elderly patients values was also deceased (Pietras *et al.,* 2009).

Another study, also conducted in the eastern regions of Saudi Arabia, showed low serum 25(OH) D concentrations among both males and females (25.25nmol/L and 24.75nmol/L, respectively) (Elsammak *et al.,* 2011).

In Oman, according to the 2004 Ministry of Health survey, out of 298 non-pregnant women of child bearing age, 21.4% were found to be vitamin D deficient (<50nmol/L) (Ministry of Health, Oman, 2008).

A more recent study tested serum 25(OH) D concentrations in 41 apparently healthy Omani women of childbearing age. The study indicated that all women had serum 25(OH) D concentrations of <50nmol/L (Al-Kindi, 2011).

Similarly, vitamin D deficiency was found to be highly prevalent in the United Arab Emirates (UAE). The results revealed that most women had vitamin D deficiency (25(OH) D ≤ 50nmol/L at study entry) (Saadi *et al.,* 2007).

A very recent study done by Anouti et al. who investigated a random sample of 208 young Emirati university students in Abu Dhabi, 138 females and 70 males. The mean serum 25(OH) D concentration for female students tested in April was 31.3 ± 12.3nmol/L, while in October, it was 20.9 ± 14.9nmol/L (Anouti *et al.,* 2011).

In Qatar, the mean overall vitamin D concentration among health care professionals working at Hamad Medical Corporation in Doha was found to be 29.3nmol/L. Vitamin D concentration was lower in females (25.8nmol/L) than in males (34.3nmol/L). A total of 97% of all participants had a mean concentration <75nmol/L, while 87% had a

mean concentration of <50nmol/L (Mahdy *et al.,* 2010).

Studies in Turkey and Jordan showed also a strong relationship with clothing, Serum 25(OH) D levels were highest in women who wore Western clothing, decreasing in traditional women wearing a *hijab*, and the lowest levels were measured in completely veiled women who wore a *niqab.*Men in these countries have higher concentrations than women (Mishal, 2001).

In Iran, a population study that included 1,210 men and women between 20 and 69 years old showed that the mean serum 25(OH) D was 20.6nmol/L (Hashemipour *et al.,* 2004).

In Lebanon, vitamin D-inadequacy among the 251 Lebanese postmenopausal osteoporotic women (from both Muslim and Christian communities) who participated in a vitamin D international epidemiological study. Vitamin D inadequacy prevalence (25-hydroxyvitamin D (25(OH) D), less than 30 ng/ml) was 84.9%. Muslim community participants had lower 25(OH) D levels compared with their Christian counterparts (P<0.001). (Gannagé-Yared *et al.,* 2009).

A recent United Kingdom (UK) survey among the white population showed 16% prevalence of insufficiency and 50% deficiency in the winter and spring, the local prevalence, in a multiethnic population, shows much higher rates of deficiency. Among South Asians tested in routine clinical practice, >90% were found to have insufficient or deficient levels (Hypponen and Chris, 2007).

In Morocco group study of 415 women aged 24 to77 years old the prevalence of vitamin D insufficiency (<30ng/mL) was 91%. (Fadoua *et al.,* 2008).

A study done in Tunisia between January and March 2002, 380 subjects aged 20-60 years were included in the study. The accumulated prevalence of hypo-vitaminosis D was 47.6%, increasing with age. Hypo-vitaminosis is highly prevalent in women (P<0.001). Multiparty, menopause, wearing the veil, and calcium and vitamin D dietary intake are factors associated with hypo-vitaminosis D (P<0.05) (Meddeb *et al.,* 2005).

Thus, it seems that the world is facing today what is, in fact, a new endemic disease that was, until recently, totally veiled. The actual percentage of vitamin-D-deficient people seems to be far greater than reported, so identifying the reasons for the dramatic increase in vitamin D insufficiency is not an easy task.

Conclusion:

More than 75 % of the premenopausal women working in Fayoum University had either vitamin –D deficiency or insufficiency. obesity, darker skin and insufficient sun exposure are the main factors leading to or associated with 25 – vitamin - D deficiency

Recommendations:

From this study we recommend further screening for males, to treat those who are vitamin -d deficient or insufficient and to follow them up for detecting any complications or of vitamin d deficiency.

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Nutrient Intakes Affecting the Nutritional Status of preschool Children by Nationality Compared with RDA in Jeddah KSA

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Abstract: Background: Dietary pattern established in early childhood significantly influence the probability of having less tendency towards junk food which certainly result in malnutrition whether under/overweight or obesity. Nutrient intakes were compared with Recommended Dietary Allowances RDA (1989) and percent RDAs were computed. Objective: The main objective of the current study to report nutrient intake among preschool- aged children in some kindergartens in kingdom of Saudi Arabia, in Jeddah and compare as percent of RDA. Subjects and Methods: A cross-sectional descriptive study was conducted on preschool children male (n= 66), female (n=55). Anthropometric data were taken using standard methods, from 121 children Saudi (77.7%) and the remaining was non-Saudi (22.3%). Aged 24 - 72 months with the aid of a questionnaire from Kindergarten children's and preschool child mothers by direct contact or by telephone. Logistic regression analyses were performed to estimate the influence of various parameters. Seven 24-hour dietary recalls assessed nutrient intakes, which were compared to the Recommended Dietary Allowances of National Academy of Science's. Results: The mean ages in months of the studied preschool children were 52.2 ± 11.20 months. Diet quality has been shown to be better among children that do meet current recommendations. The average intake of energy was lower than RDA by 35% for preschool children. Energy from carbohydrates was below the recommended values (53.5% of energy was observed vs. 55 % of energy is recommended). Low intake of calcium (85.6%), iron (72.45%) and potassium (57.45%) as percent of the RDA among children of all age groups observed in this study. Mean intake of vitamins; thiamin, niacin and vitamin D (0.48 ± 0.196, 4.99 ± 2.6503 and 3.92 ± 2.33) for Saudi and, (0.38 ± 0.16, 3.768 ± 2.11 and 2.88 ± 2.41) for non Saudi children respectively. It found that the difference between the two groups was significant at $p < 0.05$. Data was analyzed by SPSS statistical package version 10. Conclusion: These results indicated to the need for improvement in dietary habits among Jeddah children in order to produce a healthful diet and to prevent diet-related diseases in our future adult population. Community and/or school based nutrition education programs are needed to increase children and parents' awareness of the health risks arising from food intakes deviating importantly from the recommendations. It should be further investigated in more detail how this preschool age group dietary pattern, influences their nutrient intakes in order to check whether the current recommended dietary allowances represent the most optimal dietary intake for this group of preschool-aged children. At last, research should assess the health risks associated with these unhealthy eating habits of young children, deviating importantly from the age specific recommendations.

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Key words: Nutritional status - Nutrient intakes - Children - Macronutrients, Vitamins – Minerals - The Recommended Dietary Allowances.

1. Introduction

As mammals, we all begin life on an exclusive milk diet. During our first years, the transition to a modified adult diet takes place; to maintain growth and health, the infant must learn to accept at least some of the foods offered. Individual differences among children in the controls of food intake begin to emerge during this early transition period. As children's genetic predispositions are modified by learning and their experiences with food and eating, food preferences and more adult-like controls of food intake begin to emerge. Early experiences with food provide learning opportunities that are critical in the formation of food preferences and the controls of food intake (**Leann; 2002**).

Although good nutrition is important during the whole life course, it is especially important during the first years of life, since these are the most crucial years for normal physical and mental development.

In young children, dietary intake is not only linked to growth, development and nutrition-related diseases (such as deficiencies and toxicities), but also to risk factors for chronic diseases such as obesity, increased cholesterol levels and hypertension (**Ernst and Obarzanek, 1994**). In these first years of life children acquire many of the physical attributes and the social and psychological structures for life and

learning (**BMA; 2005 and Huybrechts *et al.*, 2008**). Because unhealthy lifestyle patterns might continue into adulthood (**Boulton, 1995**), it is important to strive as early in life as possible for a high-quality diet with optimal levels of food and nutrients to help maintain optimal health.

Malnutrition is still a major public health problem over large areas of the world, especially developing countries and particularly amongst low socio-economic groups (**Samai *et al.*, 2009**). Child malnutrition is a wide spread public health problem having international consequences because good nutrition is an essential determinant for their well-being. The most neglected form of human deprivation is malnutrition, particularly among Preschool children. (**Vipin Chandran, 2009**). Adequate dietary intake and nutritional status among children are important for their own growth, development and function, and there is now increasing evidence that childhood nutrition also influences adult health. Thus, childhood diet needs to be taken seriously in order to improve a nation's health as well as producing bright and active children (**Tomkins, 2001**).

The role of certain nutrients and foods in the prevention of chronic diseases like cardiovascular disease (CVD) and some cancers has been highlighted by a large number of studies (**Ascherio and Willett1995** and **Cummings and Bingham1998**). Specifically, diets with high fruit and vegetable intakes have been shown being associated with a lower risk of mortality (**Huijbregts *et al.*, 1997**) and of suffering cancer (**Cummings and Bingham, 1998**) or CVD (**Kant *et al.*, 2000**). Because of this major role of nutrition in the prevention of diseases as well as in growth and development, a series of recommended dietary allowances (RDA) (**CEC,1993**) ranging from infancy until old age, have been set both at a national and international level. In order to motivate the public to meet such recommendations, Food-Based Dietary Guidelines (FBDG) were developed based on these RDA, though expressing recommended daily intakes at the food group level, have been drawn up in different countries (**VIG, 2004 and US Department of Agriculture, 2007**).

Dietary pattern established in early childhood significantly influence the probability of having less tendency towards junk food which certainly result into malnutrition whether under/overweight or obesity (**Perveen *et al.*, 2010**). Like many other domains of development, young children's eating patterns are largely influenced by learning about what is edible and non-edible and what is acceptable within a family and the culture. A carefully timed development exists between children's early physiological and their increasing nutrition needs. The literature regarding early childhood nutrition has focused upon children's changing nutrient requirements for growth and health and has neglected the social developmental framework from which children's eating behaviors and intake patterns emerge (**Perveen *et al.*, 2010**). Appropriate nutrition during the childhood is essential for the maintenance of normal growth and good health (**Ministry of Health, 1997**).

Growth assessment best defines the health and nutritional status of children, because disturbances in health and nutrition, regardless of their etiology, invariably affect child growth and hence provide an indirect measurement of the quality of life of an entire population (**Onis *et al.*, 1993**).

The growth and mental developments are **indicators of good health and nutrition (WHO; 1995). The accurate assessment of the physical growth** and development of children is a subject that gains the interest of pediatricians and public health officers (**Tanner; 1966**). There is a worldwide variation in size and shape between children belonging to different populations of mankind (**Maysoon *et al.*, 2004**). In this context, the present study focuses its attention on the nutrient intakes affecting the Nutritional Status of preschool Children by Nationality Compared with RDA in Jeddah KSA.

2. Subjects and Methods

Study population and design

Data used for these analyses derived from a cross-sectional study in preschool children (2-6 years) include 66 boys and 55 girls were chosen by a systemic random method, Saudi (77.7%) and the remaining was non-Saudi (22.3%). Aged 24-72 months recruited from Two Kindergartens Kingdom of Saudi Arabia, Jeddah city, all children were in kindergartens and their house. The data collection initiated in October 2010 and complete in April 2011.

The methodology of this study:

In order to satisfy the objective of the study standard questionnaires was designed to cover the Food habit; which includes appetite, number of meals per day, favorite meal, and snacks. Seven days of food intake (24-hour recall) was collected. The 24-hour recall method was used to assess the usual intake of energy and nutrients for seven consecutive days. On the same day of the interview, the mothers were asked to recall type and quantity of all foods and beverages or snakes that consumed by the child during the previous 24 hours, and they were also asked to record the food intake during the other six days in their homes. Then we conformed these units

or parts into grams to calculate the daily intake from different nutrients by using food composition tables (**Robert *et al.*, 2003**). Data of the 24-hour food intake were coded and entered into the computer program of food analysis. The food intake data were analyzed based on food composition tables of the Egyptian National Nutrition Research Institute**.** The nutritional content of the food consumed or provided was calculated from the data collected using standard food tables (**National Nutrition Institute, 2006**). Results were compared with current recommendations for nutrient intakes Institute of Medicine (**2010**) and the percentages of energy derived from macronutrients; for the appropriate age-gender groups from the Institute of Medicine, Food and Nutrition Board, November **2010** which were compared to the Recommended Dietary Allowances of National Academy of Science's (**1998**).

Anthropometric indices

Anthropometric indices are combinations of measurements. They are essential for the interpretation of measurements. In children, the four most commonly used indices are weight-for-height, height-for-age, weight-for-age and BMI-for-age.

Weight and Height:

The weight and height of the children in the two groups (boy and girl) were assessed. Height was measured by a meter. The children were standing without shoes on a flat surface with feet parallel and heel together, and the head, back and heels in contact with the vertical board. The height was recorded to the nearest 0.1 cm (**WHO, 1995**). Weight of children was determined by using an electronic scale (Piscover, Poland) and was recorded to the nearest 0.1 kg. The children were weighed with light indoor clothing and without shoes (**WHO, 1995**). The anthropometric indices can be expressed in terms of Z-scores to compare a child or group of children with a reference population to assess their growth (**WHO, 1995**). Data of height and weight were entered into ENA (Emergency Nutrition Assessment) for the SMART program (**WHO, 2007**) and were transformed into Z-score.

The statistical analysis included:

Data were analyzed by SPSS statistical package version 10 (**1998**). The quantitative data were presented in the form of mean, standard deviation and range. One way ANOVA and the student T test was used to compare quantitative data and Pearson's correlation coefficient (r) has been also applied in this study between two quantities variables. Significance was considered when P value $\leq$ 0.05. Insignificance was considered when P value > 0.05.

3. Results

A cross-sectional descriptive study was conducted on preschool children male (n= 66), female (n=55). Saudi (77.7%) and the remaining were non-Saudi (22.3%). Aged 24- 72 months were chosen by a systemic random method recruited from two kindergartens, in Kingdom of Saudi Arabia, Jeddah city.

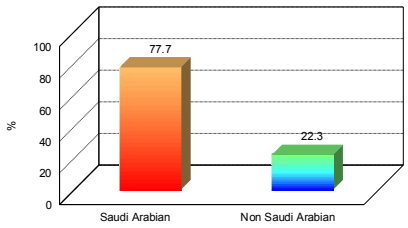

Figure (1): Percent Distribution of Nationality of Preschool Children

Most of the children were Saudi (77.7%) and the remaining was non-Saudi (22.3%) as shown in the same table and figure (1).

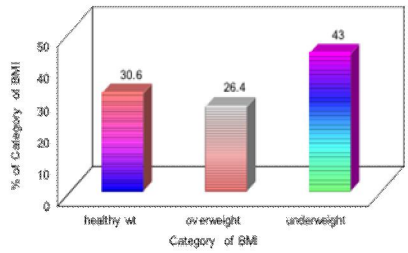

Figure (2): Percent Distribution of Categories of BMI of Preschool Children

Figure (2) showed that the highest percent of preschool children (43%) were underweight, followed by (30.6%) had healthy weight and (26.4%) were overweight.

Table (1): Describes Anthropometric measurements of a Studied Sample of Preschool Children

Variables	(Mean ± SD)	Min	Max
Weight of Preschool Children (Kg)	16.19± 3.29	9	26
Ideal of body weight	16.68±1.96	12	21
Preschool Children's height (Cm)	100.87 ± 10.37	60	119
Body Mass Index	16.19 ± 4.24	10	41.6
Ideal of Body Mass Index	15.57±0.48	14.5	18

Table (1) depict descriptive anthropometric measurements of the study sample of Preschool Children. We show mean ± SD of body weight of total males and females (16.19± 3.29 kg) and minimum weight 9kg, maximum weight 26 kg; and the mean ± SD ; minimum and maximum of ideal body weight for representing subjects i. e. (16.68±1.96, 12 and 21kg) respectively. Mean ± SD , minimum and maximum height of total responds (100.87 ± 10.37 cm) and minimum height 60cm, maximum height 119 cm. While the mean ± SD; minimum and maximum of body mass index (16.19 ± 4.24, 10 and 41.6) respectively. The same table represents also mean ± SD; minimum and maximum Ideal of Body Mass Index i.e. (15.57± 0.48, 14.5 and 18) respectively.

Table (2) Distribution of Nutritional Status of Preschool children

Anthropometry measurements	No.	%	Nutritional Status
WAZ	10 107 4	8.3 88.4 3.3	Underweight Normal Overweight
HAZ	23 94 4	19.0 77.7 3.3	Stunted Normal Tall
WHZ	15 83 23	12.4 68.6 19.0	Wasted Normal Obesity
Total	121	100.0	

As can be seen in table 2, the logistic regression analysis identified the distribution of nutritional status of Preschool children by anthropometric measurements. According to weight /age 88.4 % were normal, 8.3% were underweight and 3.3% were overweight. According to Height / Age (77.7%) were normal, 19.0% were stunted and 3.3 % were tall. While the percent of normal, wasted, and obesity children according to weight/height were 68.6%, 12.4 % and 19.0 %, respectively.

Table (3) depict (Mean ± SD) and Pearson Correlation of BMI of the study children by nutritional status. As can be seen in table (3) the level of underweight, stunted and wasted were in children of low mean of BMI (< - 2SD), 13.3, 15.78 and 14.85 for (WAZ), (HAZ) and (WHZ) respectively as compared to good nutritional status of moderate mean of BMI (normal±2SD) 16.3, 16.06 and 16.02 for WAZ , HAZ and WHZ respectively. However the level of overweight, tall and obesity were in the children of over Mean of BMI (> + 2SD) i. e., 20.68, 21.73and 17.71 for (WAZ), (HAZ) and (WHZ) respectively. As can be seen in the same table the nutritional status in WAZ and HAZ Z-Score of children was significantly different by Mean of BMI at P< 0.01 and P< 0.05 respectively but no statistically significant association was observed in Nutritional status In WHZ Z-Score.

Table (3): (Mean ± SD) and Pearson Correlation of BMI of the study children by nutritional status.

Indicator	BMI	*Z-Scores*				
		< - 2SD	±2SD	> + 2SD	Total	F-value P
WAZ	No. Mean SD	10 13.30 2.56	107 16.3 ±4.26	4 20.68 1.27	121 16.2 4.24	4.901 0.009**
HAZ	No. Mean SD	23 15.78 3.07	94 16.06 ±3.9	4 21.73 11.63	121 16.2 4.24	3.724 0.027*
WHZ	No. Mean SD	15 14.85 7.08	83 16.02 ±3.73	23 17.71 3.22	121 16.2 4.24	2. 35 NS

*P< 0.05 **P<0.01

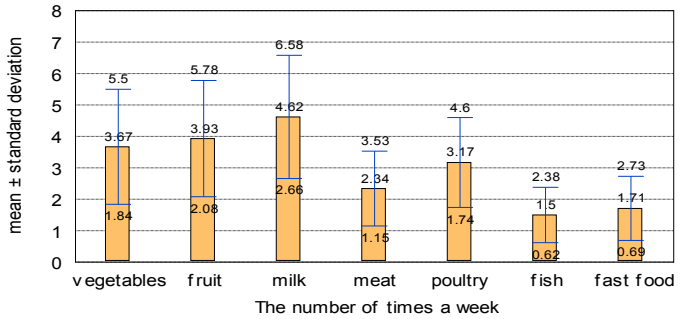

Figure (3) mean ± SD of the number of times of food intake a week of Preschool children

The means of the number of times a week of foods shown in Figure (3), it is clear that the mean of the number of times intake a week of milk (4.62±1.96) was consistently higher than the other foods, followed by 3.93±1.85 for fruit, 3.67±1.83 for vegetables and 3.17±1.43 for poultry while the lowest

number of times a week was for fish 1.50±0.88. The Minimum intake was one meal per week and the Maximum was seven meals per week.

Table (4) showed that the mean±SD of energy and macronutrient intake of preschool children by nationality. The mean of energy, protein, fat and carbohydrate for Saudi children were 1096.95±336.72, 39.48 ± 14.06, 40.39± 17.41 and 146.73±50.59, respectively. As can be seen in the same table the mean of energy, protein, fat and carbohydrate for non Saudi children were 909.17± 438.46, 32.81± 14.17, 31.43 ± 21.44 and 123.24± 61.78, respectively.

It can be noticed that the difference in energy, carbohydrate, protein and fat were significant at (p < 0.05*) between Saudi and non- Saudi preschool children.

Table (5) showed that the mean±SD of vitamin intake of preschool children by nationality. The mean intake of thiamin, riboflavin, niacin, vitamin A, vitamin C and vitamin D for Saudi and non -Saudi children were (0.48 ± 0.196 mg/d), (0.87 ±0. 545 mg/d), (4.99 ± 2.65 mg/d), (591.99 ± 763.6 µg/d), (47.85 ± 49.35 mg/d), and (3.92± 2.33 µg/d) and (0.38 ±0. 16 mg/d), (0.62 ±0. 38 mg/d), (3.768 ± 2.1091 mg/d), (288.75± 186.91 µg/d), (19.82 ± 32.85 mg/d), and (2.88 ± 2.41 µg/d) respectively. It can be noticed that the difference in thiamin, riboflavin, niacin, vitamin A and vitamin D were significant at (p< 0.05) between Saudi and non- Saudi preschool children and the difference is highly significant in vitamin C intake among Saudi and non- Saudi preschool children at (p<0.01).

Table (4): Mean ± SD of Macronutrients Intakes of Preschool children by Nationality

Variables / Nutrients	Saudi Arabian Mean ± SD	Non Saudi Arabian Mean ± SD	RDA	% of RDA For Saudi Arabian	% of RDA For Non Saudi Arabian	P
Energy	1096.95±336.72	909.17± 438.46	1300	84.37	69.93	0.019*
Protein	39.48 ± 14.06	32.81± 14.17	16	246.7	205	0.032*
Fat	40.39± 17.41	31.43 ± 21.44	32.5	124.3	96.7	0.027*
Carbohydrate	146.73 ±50.59	123.24 ± 61.78	130	112.8	94.8	0.046*

Table (5): (Mean ±SD) and % of RDA of Vitamins and minerals Intakes of Preschool children

Indicator	Saudi Arabian	Non Saudi Arabian		Saudi Arabian	Non Saudi Arabian	p
	Mean ± SD	Mean ±SD	RDA	% of RDA	% of RDA	
Thiamin (mg/d)	0.48 ± 0.196	0.38 ± 0.16	0.53	90.5	71.7	0.014*
Riboflavin (mg/d)	0.87 ± 0.545	0.62 ± 0.38	0.55	158.2	112.7	0.023*
Niacin (mg/d)	4.99 ± 2.6503	3.768 ± 2.11	7	71.3	53.7	0.03*
Vitamin A (µg/d)	591.99 ±763.62	288.75± 186.91	350	169.1	82.5	0.044*
Vitamin C (mg/d)	47.85 ± 49.35	19.82 ± 32.85	20	239.2	99.1	0.006**
Vitamin D (µg/d)	3.92± 2.33	2.88 ± 2.41	5	78.4	57.6	0.044*
Calcium (mg/d)	641.69±444.38	443.35±290.55	650	98.7	68.2	0.03
Iron (mg/d)	6.98±5.15	5.45±1.5038	8.5	82.1	64.1	NS
Potassium (mg/d)	2041.59±1094.39	2029.03±1079.18	3400	60.0	59.6	NS
Phosphorus (mg/d)	666.99±273.4	529.26±222.1	480	138.9	110.2	0.01
Magnesium (mg/d)	131.36±91.73	90.97±57.84	105	125.0	86.6	0.032
Zinc (mg/d)	9.78±13.56	3.94±1.29	4	244.5	98.5	0.022

*P< 0.05 **P<0.01 NS: Not Significant

The same table showed also the mean±SD of minerals intake of preschool children by nationality. The mean of calcium, iron, potassium, phosphorus, magnesium and zinc for Saudi and non-Saudi children were (641.69 ± 444.38 mg/d), (6.98±5.15 mg/d), (2041.59 ± 1094.39 mg/d), (666.99 ± 273.94 mg/d), (131.36 ± 91.73 mg/d) and (9.78 ± 13.56 mg/d) and (443.35± 290.55 mg/d), (5.45 ±1. 5038 mg/d), (2029.03 ±1079 mg/d), (529.26 ± 222.51 mg/d), (90.97 ± 57.84 mg/d) and (3.94 ± 1.29 mg/d) respectively.

4. Discussion

The present study is a cross sectional descriptive study was conducted on preschool children was Saudi (77.7%) and the remaining was non-Saudi (22.3%). As shown in figure (1), aged 24 - 72 months were chosen by a systemic random method recruited from two kindergartens, in Kingdom of Saudi Arabia, Jeddah city. To report food consumption, nutrient intake among preschool- age and compared with Recommended Dietary Allowances (**RDA,1989**) and the percent of intake from RDAs were computed. The

mean ± SD for age in the months of the studied preschool children was 52.2 ± 11.20 months.

Nutritional Status

Table (1) shows that the mean body weight of total males and females (16.19± 3.29kg) and minimum weight 9kg , maximum weight 26 kg and the mean height of total males and females (100.87 ± 10.37 cm) and minimum height 60cm, maximum height 119 cm.

Weight for age is the most widely used indices for assessment of nutritional status in children. Using the international age and sex specific child BMI cutoff values define overweight and obesity (**Cole *et al.*, 2000).** We calculated the combined prevalence of overweight and obesity; in the present study according to categories of BMI revealed that the majority of preschool children (43%) were underweight, (30.6%) had healthy weight, and (26.4%) were overweight as can be seen in Figure (2). Data from national surveys by **Prema and Hema, 2009** have shown that in India nearly half the preschool children are under –weight or stunted and less than a fifth are wasted. According to these results it is clear that the nutritional status between preschool children in Jeddah KSA better than in India study.

Al-Hazzaa *et al.* (2007) Study of adiposity and physical activity levels among preschool children in Jeddah, KSA calculated the combined prevalence of overweight and obesity in his study to be 41.8 %. These prevalence rates were higher than what was reported in our study which revealed that prevalence of overweight and obesity were (26.4%).

Our results as shown in table (3) revealed that the level of underweight stunted and wasted were in children of low mean of BMI 13.3, 15.78 and 14.85, respectively as compared to good nutritional status of moderate which the mean of BMI was 16.3, 16.06 and 16.02, respectively. However the level of overweight, tall and obesity were in the children of over Mean of BMI by 20.68, 21.73and 17.71 Nutritional status in WAZ and HAZ Z-Score of children was significantly different by BMI at P< 0.01 and P< 0.05 respectively but no statistically significant association was observed in Nutritional status In WHZ Z-Score.

It is generally accepted that childhood obesity is directly related to the elevated consumption of food products containing high concentrations of simple or refined sugars and fried foods, as well as poor dietary habits and lack of moderate and intense physical activity. It has also been pointed out that different individuals whose diets contain equivalent energy densities may accumulate different levels of neutral fats in their adipose tissue, due to differences in the efficiency of free energy utilization in the body's general biosynthetic processes, and in the efficiency of other types of biological processes. It has been suggested that these differences may be due to differing metabolic structures based on variations in individual genes; furthermore, a variety of environmental factors that may lead to diverse types of metabolic expression when acting upon individual genes also contributes to these differences **(Chellini *et al.*, 2005).**

Consumption of food

The questionnaire used in the present study was valid and reliable tool for measuring the environmental factors availability, food rules, correlation of nutritional status for preschool children Food intake and their effect on BMI of preschool children in line with finding from another study **(Perveen *et al.*, 2010; Tara *et al.*, 2010; and Mohammad et al., 2008).** Most American preschoolers are not meeting dietary recommendations (**Krebs-Smith *et al.*, 1996; Nicklas *et al.*, 2001; Padget, and Briley 2005Kranz *et al.*, 2006a; and Ball *et al.*, 2008)** even though diet quality has increased slightly in preschoolers over the past few decades **Kranz *et al.*, 2005.**

Diet quality has also been shown to be better among children that do meet current recommendations **(Padget and Briley 2005 Kranz *et al.*, 2006a, and Kranz *et al.*, 2006b).** The data presented in these studies aimed to report dietary intake and physical among preschool-aged children living in rural American Indian (AI) communities prior to a family-based healthy lifestyle intervention and to compare data to current age-specific recommendations; they results showed that most children were meeting requirements of macro- and micronutrients that do meet current recommendations but are not consuming recommended amounts of fruits, vegetables, whole grains and consuming excessive amounts of added sugar, partially due to sweetened beverage intake. It is important to consider food sources that may explain the discrepancy between adequate micronutrient intakes and inadequate food group intakes. White bread and ready-to-eat cereal, food sources that are often fortified with vitamins and minerals, were among the most frequently reported foods in this sample of children.

In a recent another large cross-sectional study among children aged two to five years, children's dietary intake of nutrients and food groups decreased as added sugar intake increased (**Kranz *et al.*, 2005**). Changes in beverage pattern consumption may also change nutrient and food intake. Increased sweetened beverage consumption is related to decreased milk consumption among children **(Harnack *et al.*, 1999,**

Frary *et al.*, 2004; Blum *et al.*, 2005 andMarshall *et al.*, 2005).

Our study in contrast of these studies as shown in figure (3) it is clear that the mean number of times intake a week of milk (4.62±1.96) was consistently higher than the other foods, followed by, (3.93±1.85) for fruit, (3.67±1.83) for vegetables, (3.17±1.43) for poultry while the lowest number of times intake a week was for fish i.e. (1.50±0.88). The Minimum was one meal per week and the Maximum was seven meals per week.

Modern lifestyle extends the umbrella of social responsibility for provision of appropriate nutritionally balanced foods to children of all age groups in particular the children under 5 years of age of all socio -economic groups of civil society which starts from home leads to the health professionals at all health outlets, Nutritionists, Dieticians, schools and the food industry. Dietary pattern established in early childhood significantly influence the probability of having fewer tendencies towards junk food which certainly result into mal nutrition whether under/overweight or obesity **(Perveen *et al.*, 2010).**

Energy and Dietary intakes:

Vijay *et al.*, 1995 study results indicated that the mean energy intakes of all age group children were below the RDA ; thus their average energy intakes were 229 kcal,,3384kcal below the RDA for 1-3 and 4-6 group, respectively . Our results indicated that the mean energy intakes of all age groups Saudi and non Saudi children 1096.95±336.72 and 909.17± 438 respectively were below the RDA as presented in table (4); thus their average energy intakes as percent of RDA were 84.37% and 69.93% for Saudi and non Saudi children respectively. Low level of energy reported in this study was likely due to underreporting of food intakes **(Murphy *et al.*, 1992).** According to **Livingstone *et al.*, 1990 and Mertz *et al.*, 1991** the underreporting of energy intake was approximately 20% compared with measured energy requirements. When estimated 20% underreporting is included, the mean energy intakes of children would be closed RDA for energy.

On average, the American child's diet was high in total fat, over consumption of fat, saturated fat and cholesterol by American children has been reported from New Hampshire Farm Burea (NHANFB II) (**Kimm *et al.*, 1990).** Although percent of energy from fat remained relatively constant over age, mean percent of energy from fat was 5.3 to 6.8 higher than the recommended (30% of energy is recommended) by expert committees **(Weidman *et al.*, 1983 & Consensusl., 1985).** Our study represents that an average intake from fat also higher than RDA. Data from Continuing Survey of Food Intakes by Individuals (**CSFII,1986**) indicated that the average percent of energy from total fat for children ages l-5 years was 34% and that 88 % of them had intakes exceeded fat recommendations **(Nicklas *et al.*, 1993).** Similar results were reported from the The Nationwide Food Consumption Survey (NFCS), 1977-78 **(Albertson *et al.*, 1992**), the Bogalusa Heart Study **(Nicklas *et al.*, 1989**), and the Lipid Research Clinics Program Prevalence Study **(Salz *et al.*, 1983).** Our results indicated that the average percent of energy from total fat for children ages l-5 years were 32.6%. So our results are agreeing with these reports.

Energy from carbohydrate in our study was below the recommended values i.e. (53.5% of energy was observed vs. 55 % of energy is recommended). This was primarily due to higher contribution of energy from fat toward total calories. Our resulting agreement with **(Viji *et al.*, 1995)** that's who reported that the energy from carbohydrate was below the recommended values (49 to 51% of energy was observed vs. 55 % of energy is recommended).

Calcium and vitamin D are two essential nutrients long known for their role in bone health. Over the last ten years, the public has heard conflicting messages about other benefits of these nutrients—especially vitamin D—and also about how much calcium and vitamin D they need to be healthy. Scientific evidence indicates that calcium and vitamin D play key roles in bone health. The current evidence, however, does not support other benefits of vitamin D or calcium intake. More targeted research should continue. Higher levels have not been shown to confer greater benefits, and in fact, they have been linked to other health problems, challenging the concept that "more is better **(IOM, 2010).**

Low intake of , calcium (85.6%), iron (72.45%) and potassium (57.45%) as percent of RDA among children of all age groups observed in our study is a concern as presented in table (5). Absolute intake of vitamin thiamin and niacin was below the RDA for all age groups studied. Percent intakes of thiamin and niacin were 80% and 63.45% from RDAs respectively. While copper, sodium and potassium were not computed because RDA values are not available for these nutrients **(National Academy of Sciences (1989).** However, the intakes of copper, sodium and potassium were adequate.

Conclusion: These results indicate the need for improvement in dietary habits among Jeddah children in order to produce a healthful diet and to prevent diet-related diseases in our future adult population. Community and/or school based nutrition education programs are needed to increase children and parents' awareness of the health risks arising from food intakes deviating importantly from the

recommendations. It should be further investigated in more detail how this preschool dietary pattern, influences their nutrient intakes in order to check whether the current recommended dietary allowances represent the most optimal dietary intake for this group of preschool-aged children.

At last, research should assess the health risks associated with these unhealthy eating habits of young children, deviating importantly from the age specific recommendations

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Survey role of knowledge sharing (KS) on Intellectual capital management of emoloyees

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Abstract: Knowledge sharing is of vital importance to organizations, enabling them to develop skills and competences, increase value, and sustain their competitive advantage. Knowledge is a firm's most valuable resource because it embodies intangible assets, routines, and creative processes that are difficult to imitate. Thus in this study we have investigated the role of Knowledge sharing as facilitator Intellectual capital management of emoloyees in the organizations . This study mainly probes Knowledge sharing as a tool which is able to manage, store, and transmit structural knowledge. It can support us in our efforts to make the knowledge stored in the human brain or in documents available to all employees of an organization. Also we present Intellectual capital management for convenient knowledge sharing as a successful case studies in management .
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Keywords: knowledge sharing (KS); knowledge management(KM) ; Intellectual capital (IC)

1. Introduction

Due to the knowledge management (KM) revolution and advancements of the Internet, the value of knowledge assets has been greatly enhanced. Many companies are building knowledge management system (KMS) in order to manage organizational learning and business knowhow.
The main purpose of such a policy is to help knowledge workers to create important business knowledge, to organize it, and to make it available whenever and wherever it is needed in the companies (O'Brien & Marakas, 2006).

The advent of internet-related information technology such as intranets, extranets, and intelligent agents has contributed significantly to the increased interest in knowledge management: Organizations are beginning to connect themselves in ways that they hadn't planned for or expected… Groups, departments, and teams suddenly find themselves being able to share information that they hadn't been able to share before.

The highest value of IT to KM is in allowing the expansion and universalization of the scope of knowledge and in increasing the speed of transferability. Additionally using IT, we are able to retrieve and store knowledge in individual or groups, which allows this knowledge to be shared with other divisions in the same organization or business partners in the world. Furthermore, IT contributes to the integration of knowledge or even to the stimulation of new knowledge (Davenport & Prusak, 1998).

Today, the competitiveness of the firm relies less on traditional factors (capital, land, and labor) than was true in the past. Knowledge now appears to be replacing these traditional factors. Moreover, knowledge will become not just a source of competitive advantage but the only source of it (P.F. Drucker, 1993).

However, many companies have faced various kinds of difficulties in implementing KMS. First, if knowledge is merely accumulated in workers' brains, there is no way of recording it systematically.

Second, even though knowledge is recorded and recorded in documents, it is very complicated to search for, retrieve, or review it, a problem which erects barriers to the diffusion of knowledge. Thus, In past times, even though managers knew how important KM was, it was very difficult to implement it successfully (Bradley, Paul, & Seeman, 2006).

Within KM, maturity and the use of information technology (IT) development facilitates new methods and applications (such as groupware, online databases, intranets, etc.) ; It allows firms to deliver products and services better in quality and thus to achieve competitive advantage and profit (P.H.J. Hendriks, 1999, C.W. Holsapple, 2002, G.S. Lynn, R.R. Reilly, 2000, J.B. Quinn, J.J. Baruch 1999).

Thus, the growth of KM has been closely tied to information and communication technology (Chumer, Hull, & Prichard, 2000). Therefore, it is found that IT plays a major role in the implementation of KMS (Hislop, 2002). Nevertheless, few studies explore the role and effect of information technologies in the KMS. Hence, the purpose of this study is to investigate the role and effect of IT in sharing knowledge in the KMS as a factor of success in knowledge management project, and introducing new and effective method for it.

To deal with this issue more effectively, we focus on a key question:

- How can information technology facilitate knowledge sharing in organization?

The research indicates an important issue of KM. that, IT is an indispensable enabler of KM. while IT-enabled knowledge management goes beyond mere automation to play an 'informating' role in organizations by facilitating knowledge sharing.

2. Definitions (Knowledge, Knowledge management and Intellectual capital management

2.1. Knowledge

Knowledge, learning and cognition are classical terms that have been rediscovered in the context of the information technology and knowledge management revolutions. Beckman (1998) compiled a number of useful and relevant definitions of knowledge and organizational knowledge:

- Knowledge is organized information applicable to problem solving (Woolf, 1990).
- Knowledge is information that has been organized and analyzed to make it understandable and applicable to problem solving or decision-making (Turban, 1992).
- Knowledge encompasses the implicit and explicit restrictions placed upon objects (entities), operations, and relationships along with general and specific heuristics and inference procedures involved in the situation being modeled (Sowa,1984).
- Knowledge consists of truths and beliefs, perspectives and concepts, judgments and expectations, methodologies and knowhow (Wiig, 1993).
- Knowledge is the whole set of insights, experiences, and procedures which are considered correct and true and which therefore guide the thoughts, behaviors, and communication of people (van der Spek and Spijkervet, 1997).
- Knowledge is reasoning about information to actively guide task execution, problem-solving, and decision-making in order to perform, learn, and teach (Beckman, 1997).
- Organizational knowledge is the collective sum of human-centered assets, intellectual property assets, infrastructure assets, and market assets (Brooking, 1996).
- Organizational knowledge is processed information embedded in routines and processes which enable action. It is also knowledge captured by the organization's systems, processes, products, rules, and culture (Myers, 1996).

A number of other authors have also proposed knowledge typologies. Nonaka and Takeuchi (1995) have divided knowledge accessibility into two categories: tacit and explicit. Beckman (1998) identifies three stages of accessibility: tacit, implicit, and explicit.

- Tacit (human mind, organization)—accessible indirectly only with difficulty through knowledge elicitation and observation of behavior.
- Implicit (human mind, organization)—accessible through querying and discussion, but informal knowledge must first be located and then communicated.
- Explicit (document, computer)—readily accessible, as well as documented into formal knowledge sources that are often well-organized.

2.2. Knowledge management

Knowledge management is defined as: "the systematic, explicit, and deliberate building, renewal, and application of knowledge to maximize an enterprise's knowledge-related effectiveness and returns from its knowledge assets" (Wiig, 1993).

Sveiby (1998) defines knowledge management is 'the art of creating value from an organization's intangible assets. Moreover, he identifies two main tracks of knowledge management activities: one track focuses on knowledge management as the management of information and the other track as the management of people.

Other researches show; Linking the individual perspective of knowledge to the organizational level, organizational knowledge creation theory is concerned with the processes which make available individual knowledge to the organizational knowledge system (Nonaka and von Krogh, 2009). This knowledge processes consist of several steps, starting with the creation of knowledge

followed by the use of knowledge, the transfer and sharing of knowledge, and the storage and retrieval for further use (Seufertet al. 2004). A crucial and difficult step in the organizational knowledge process is the conversion of tacit knowledge into explicit knowledge. as we explain before; Tacit (implicit) knowledge is unarticulated and rooted in experience and intuition and tied to the senses and explicit knowledge is uttered, can be formulated in sentences, has a universal character and is accessible through consciousness (Nonaka and von Krogh, 2009). Only explicit knowledge can be integrated in the organizational knowledge base. To support the transformation of tacit to explicit knowledge and to facilitate the remaining steps of the organizational knowledge process, the discipline of knowledge management has evolved since the early 1990s (Nonaka 1999; Spender 1996). Knowledge management (KM) involves all practices of an organization to create, store, use and share knowledge (Probst et al. 1998).

3. Literature review

Knowledge sharing is the behavior of an individual dispersing his or her obtained knowledge and information to other colleagues within an organization (Ryu, Ho, & Han, 2003).

Knowledge sharing involves a process of communication whereby two or more parties are involved in the transfer of knowledge. Hence, knowledge sharing is defined as a process of communication between two or more participants involving the provision and acquisition of knowledge (Usoro, Sharratt, Tsui, & Shekhar, 2007).

Recently, researchers have highlighted the various factors that affect an individual's willingness to share knowledge, such as information and communication technologies, costs and benefits, incentive systems, extrinsic and intrinsic motivation, social capital, social and personal cognition, organization climate, and management championship (Alavi & Leidner 1999; Bock & Kim, 2002 ;Bock et al., 2005; Chiu et al., 2006; Hsu et al., 2007; Kankanhalli et al., 2005; Koh & Kim, 2004; Orlikowski 1996; Purvis et al., 2001; Wasko & Faraj, 2005). Therefore, we could presume that individuals' behavior for knowledge sharing is affected by the contextual factors and personal perceptions of the knowledge sharing in which they partake in. Social cognitive theory (SCT) (Bandura, 1982, 1986, 1997) is a widely accepted model for validating individual behavior (Compeau & Higgins, 1995).

The norm of reciprocity and trust are treated as two major contextual factors influencing personal perceptions and a member's behavior. Knowledge sharing self-efficacy, perceived relative advantage, and compatibility are seen as predictors of personal factors since they are all considered as the main influences shaping users' behavior (Bandura, 1982, 1986, 1997; Igbaria & Iivari, 1995;Rogers, 2003; Sia, Teo, Tan, & Wei, 2004; Verhoef & Langerak, 2001).

Having looked at the purpose and resources for knowledge sharing, we now turn to the process of knowledge sharing by looking the formal and informal settings in which knowledge sharing occurs and looking at the content of knowledge shared. Bartol and Srivastava (2002) define knowledge sharing as the action by which employees disseminate relevant information to others across the organization. According to Bock and Kim (2002), knowledge sharing is the most important part of knowledge management (KM). Apart from Bartol and Srivastava's operational definition a more social definition suggested by Helmstadter (2003, p. 257) characterizes knowledge sharing in terms of ''voluntary interactions between human actors through a framework of shared institutions, including ethical norms, behavioral regularities and so on.

In general, social psychologists consider that knowledge sharing motivation has two complementary aspects: egoistic and altruistic (E.L. Deci, 1975). The first was based on economic and social exchange theory. It includes economic rewards empirically; Bock and Kim combined the two theories with social cognitive theory to propose expected rewards, expected social associations and expected contribution as. The major determinants of an individual's knowledge sharing attitudes.

Moreover, Bock et al. applied these two theories to produce two antecedents of sharing attitude: anticipated extrinsic rewards and anticipated reciprocal relationships. The second, altruistic motive, assumes that an individual is willing to increase the welfare of others and has no expectation of any personal returns. This resembles organization citizenship behavior (OCB), which is discretionary individual behavior that is not directly or explicitly recognized by a formal reward system, and promotes the effective functioning of the organization (C.A. Smith, D.W. Organ, 1983).

In additional, according to researches; Knowledge sharing requires collaboration between the users of knowledge; namely the collaborators. This task cannot be accomplished simply by storing knowledge in the repository. It also requires a mechanism, which helps people find the collaborators with relevant knowledge. Collaboration over the Internet communities has characterized itself by heavily relying on interaction among the collaborators (Bistro¨ m, 2005; Eikemeier and Lechner, 2003). Collaborators can be any virtual users who interact to achieve the goals of resources discovery, access, knowledge sharing, group communication and discussion. The collaboration for knowledge sharing should be enacted without spatial and temporal limitations. In addition, it should take place over medium such as the Internet and therefore beyond the geographical boundaries.

3.2. Role of knowledge sharing on Intellectual capital management of emoloyees

The means by which knowledge is shared within organizations and the factors that facilitate knowledge sharing/transfer are core issues in knowledge management. advances in technology have facilitated the recent growth in systems designed for managing organizational knowledge, IT is comprehensively utilized by members in organization, IT is comprehensively constructed in organization, top management is capable of applying IT, members in organization apply IT to search and use current organizational knowledge, and members in an organization apply IT to create new knowledge (Peter J. Sher & Vivid C. Lee, 2003)

The Internet, one of the IT tools, gives rise to virtual communities that aim at facilitating collaboration by providing an environment for mutual sharing and interaction. A collaborative process in such an environment involves intensive online knowledge discovery and knowledge sharing between collaborators, such as knowledge consumers and knowledge contributors.(Stephen J.H. Yang, Irene Y.L. Chen,2007)

Butler et al. (2007) indicate that effective, i.e., successful, KMS are constituted by highly accessible and wellintegrated webbased Intranet technologies that facilitate knowledge sharing on tasks/processes and/or generic/infrastructures among general and/or specific communitiesofpractice. Benbya (2006, p. 4) also argues that effective knowledge sharing technologies (i.e., core IT artefacts) are integrative, highly accessible, and searchable, because ‘‘integration is a strong predictor of KMS effectiveness, the ability of a system to integrate knowledge from a variety of sources and present it in a manner that enables easy access and reuse is associated with both knowledge quality and knowledge usage.” IT artefacts, such as email, datamining and learning tools, are important, but noncore, as they are generally not wellintegrated and do not provide a focal point or node for effective knowledge sharing (cf. Benbya, 2006) then we need a system can manage knowledge integrity.

In the process of KM, the absorption, creation, arrangement, storage, transfer and diffusion of knowledge are all dependent on assistance provided by IT. Khandelwal and Gottschalk (2003) pointed out that the application of IT to the support of KM apparently influences the results of knowledge collaboration within the organization. There are some example of using information technology for implementing KMS and sharing knowledge in organization:

HewlettPackard (HP), a company competing in the market of computers, peripheral equipment and other electronic equipment developed CONNEX (http:// www.carrozza.com/connex), a PeopleFinderKMS (T Carrozza, phone interview and followup email with developer of CONNEX at HP Labs, September 16, 1999). The goal of the project was to build a network of experts, available online, to provide a guide to human knowledge within HP. CONNEX consists of a centralized database of user knowledge profiles, with a Web browser interface that allows users to find profiles in multiple ways. User's profiles contain a summary of their knowledge and skills, affiliations, education and interests, as well as contact information. CONNEX users can easily find experts within HP by searching the database by any combination of profile fields or by browsing through the different areas of knowledge, geographies and/or names.

To support a large user base with high volume of transactions, CONNEX was built using Sybase database and Verity's Topic search engine, on an HP platform.The National Security Agency (NSA) has also taken a step towards the implementation of a system to locate experts for using their knowledge in critical situations (A. Wright, W. Spencer, 1999). The NSA is part of the Intelligence Community, and their two missions are Foreign Signals Intelligence and National Information System Security. The goal of

the implementation of the knowledge and skills management system (KSMS), a PeopleFinder KMS, is to catalog the talent pool within the agency to allow the precise identification of knowledge and skills, and to take advantage of information technology. The NSA went through the development of the system by applying database engineering in order to solve the complexities of implementing an adequate, workable and successful KMS. They also divided the execution of this project into several Work Tasks and developed knowledge taxonomy applicable to their workforce.

4. Methodology

Research methods can be generally divided into two types: quantitative research and qualitative research. The main objective of this research is to explore the roles and effects of IT on successful knowledge sharing on knowledge management project, (Berg, 2000; Hammersley, 1996). In that case, the characteristics of the qualitative research method make it better suited to be applied here. Therefore, there is a design phase involved, which possesses distinct methodology.

The phase involved voluminous review of the literature and indepth interviews with senior managers in roads management center, both of which were aimed at collecting data. Interviews are one of the mostextensively used methods of data collection (Bryman & Burgess, 1999). The individual indepth interviews conducted in this study are of a faceto face, which is one of the most common approaches in qualitative research. This type of interview involves asking a number of predetermined questions and special topics. Under such circumstances, respondents are able to determine the direction and content of the interview within a broader framework provided by the interviewer. After the interview at each manager had been completed, the results were assembled, transcribed and emailed to the respondents for their review and approval in order to prevent any misinterpretations. This process is expected to provide this study with a richer and more holistic appreciation of the problems regarding KMS.

There is a list of questions in interviews?

- What is the different between new technology and previous technology for knowledge sharing in your organization?
- What are the advantages of wiki technology?
- How can this new technology help client in better knowledge sharing in organization?
- Is there any limitation in using of new technology?
- Is it critical for your organization to get appropriate knowledge sharing?

5. Case Study

The roads management center, in Ministry of Road & Transportation of Iran, has implemented Knowledge Management System by focusing on creating, gathering, organizing and disseminating an organization's knowledge as opposed to `information' or 'data'. The development of KMS, in this center, demands that knowledge be obtained, produced, shared, regulated and leveraged by a steady conglomeration of individuals, processes, information technology applications and a knowledge sharing organizational culture. For getting this target, they use new technology to make appropriate condition for fascinating knowledge sharing in organization because the Ministry of Road & Transportation had been used the technology for knowledge sharing in knowledge management project already and it was not proper for this goal.
New technology is Wiki technology, as one of the advantages of web.٢, has many good points in sharing knowledge such as in customer/client collaboration, documentation, and developing an online community. The information is often added to wiki but not deleted when no longer relevant or accurate or updated when changed. Wiki offers an excellent way to manage documents and knowledge integrity.

In wiki, foremost is the fact that documents are edited in a very visible way, which adds accountability and Members of organization have to justify the changes because everybody can see it. Also, each of members can edit or add new information to other knowledge or information that has been written by other members, previous technology did not have this feature and it was the main weakness of that. This faint was the reason of employee's discontent.

Wiki's inherent version control means organization never have to worry about losing a document again. The use of wiki can also save time by letting organization and its clients share documents for collaborative editing and quicker approval. A technical advantage of wiki over other document management tools is that there are plenty of good open source versions available at little or no cost. Plus, wiki is usually extensible, so organization can customize them to its needs and doesn't need an

expert administrator or extra hardware resources. Despite wiki's benefits, the success of wiki in KMS depends on how dedicated the participants are in using the wiki and checking in regularly and wiki platforms have a bit of a learning curve. With training members in organization the usage of wiki reveals obviously.The advantages of wiki technology help roads management center for making proper condition between clients to share their knowledge more than before.

6. Conclusion

In this paper, we have analyzed the role of the information technology as facilitator of knowledge sharing in organization. We considered IT as a tool which is able to manage, store, and transmit structural knowledge is a critical solution for implementing impressive knowledge management. Also we realized the type of the It's tools are so important in quality of knowledge sharing. And we proposed new technology for better knowledge sharing that it is wiki technology. We understood wiki has more benefits than the rest of technologies that had been used for knowledge sharing in organization. The roads management center, as a successful case, with using the wiki technology has made suitable condition for their clients in knowledge sharing.

7.Limitation

Every researches has limitations, in our research the main limitation was making an appointment with senior managers of roads management center for interview, because they have crucial roles in this center and most of the time ,they are in different meeting about business issues.

8.Recommendation

Our recommendations for other organizations in implementing a successful knowledge management project is that before any actions in this case first realize their organization needs and select an appropriate information technology as fascinating way in knowledge sharing. Wiki is tested as proper technology among other as a tool for sharing knowledge.

9. For future researches

- Identification & Assessment impressive cultural factors in using introduced technology on sharing knowledge in organization

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Renal Colic Pain Relief by Intranasal Desmopressin

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Abstract:.The relief of acute pain is key in the modern practice of emergency medicine. Pain is the most common complaint of emergency department patients, seen in one half to three quarters of all patients. According to some last studies desmopressin acts quickly, has no apparent adverse effects, reduces the need for supplemental analgesic medications, and may be the only immediate therapy necessary for some patients25. Therefore in the present study, we have conducted to assess the efficacy of intranasal desmopressin in patients with acute renal colic.In this inventional study, patients 18-55 years old with probably acute renal colic based on history, physical exam and past medical history came to emergency department of Imam khomeini Hospital of Ahvaz Jundishapour University of Medical Sciences were evaluated randomly. we evaluated recorded information in SPSS software and analyzed them by *"Paired t test"(* p-value<0.05).Seventy patients were evaluated in this study including 12 female (17.1%) and 58 male (82.8%) with mean age 33.7±10.1**.** Comparison of pain score in zero and 30 min (efficacy of desmopressin alone) with "paired t test" showed significant results (p-value <0.00001).It has been suggested that an antidiuretic hormone 24 (ADH)-induced decrease in diuresis could contribute to the rapid relief of pain in renal colic.
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Keywords: Desmopressin,Acute renal colic

1. Introduction

"The relief of acute pain is key in the modern practice of emergency medicine.[1]" Pain is the most common complaint of emergency department patients, seen in one half to three quarters of all patients. Satisfaction with emergency care often depends on the techniques and timeliness of analgesia as well as the discharge plans for pain relief.[2, 3] Methods must be not only effective but also safe. In reality, physicians often prescribe a suboptimal drug in an inadequate dose at an excessive interval or via an inappropriate route. Pain relief is best addressed with a plan that incorporates administration, nurses, and clinicians. Acute renal colic pain is probably the most excruciatingly painful event a person can endure. Renal colic affects approximately 1.2 million people each year and accounts for approximately 1% of all hospital admissions.The ED physician are often the first to see and evaluate these patients. While proper diagnosis, prompt initial treatment especially pain relief, and appropriate consultations and substantial patient education are clearly the primary responsibility of the emergency physician.Many medications are used for relieving pain in renal colic and helping to passage of renal stone: Narcotics & Opiates, NSAIDs, Antiduretics, Alfa blockers, Ca channel blocker, Steroids, Anticholinergics, *Narcotics and opioids* are the mainstay of medical therapy for patients with acute renal colic is parenteral narcotic analgesics. They are inexpensive and quite effective. Some diverse effects represent. Choosing any particular agent tends to be somewhat arbitrary. Morphine, meperidine (Demerol) is the most commonly used. NSAIDS[24] have been used in the management of renal colic as effective factors for several years. Sodium diclofenace is a products which was used by injection in pain management .It has been suggested that an antidiuretic hormone (ADH)-induced decrease in diuresis could contribute to the rapid relief of pain in renal colic.[8-9-12] Desmopressin(1-desamino-8-D-arginine vasopressin) is a synthetic structural analog of ADH. The mechanism by which desmopressin relieves acute renal colic pain is unclear, but probably manifold.[11] Studies using desmopressin therapy for up to a few years have shown no toxic reactions or significant changes in laboratory values[20]. According to some last studies desmopressin acts quickly, has no apparent adverse effects, reduces the need for supplemental analgesic medications, and may be the only immediate therapy necessary for some patients. Therefore, in the present study, we have conducted to

assess the efficacy of intranasal desmopressin in patients with acute renal colic.

2. Material and Methods

In this inventional study, patients 18-55 years old with probably acute renal colic based on history, physical exam and past medical history came to emergency department of Imam khomeini Hospital of Ahvaz Jundishapour University of Medical Sciences were evaluated randomly if they have no history of hypertension, coronary artery disease,rhinitis, influenza, coagulopathy, anticoagulant therapy, peptic ulcer, bronchial asthma, azotemia, hepatic failure, pregnancy use of other analgesics during the 4 hours before our treatment, receiving a-blockers before admission, addiction, surgery on kidneys or ureters, intravenous fluid therapy just before admission and took written consent at the first. There was no control group for ethical issues. A visual analogue scale (VAS) was used to assess the intensity of pain; this consisted of a 10-cm horizontal scale ranging from `no pain' (VAS=1) to `unbearable pain'(VAS=10), with values recorded to the nearest millimeter. Patients received 40 micrograms DDAVP intranasal of available product (4puff,each puff equivalent to 10 micrograms and alternately in each nostril of nose).Pain score was recorded at 15, 30, 45 and 60 minutes after DDAVP administration by VAS. At 30 min, sodium diclofenace 75 mg intramuscular was injected if any degree of pain. At 45 min, morphine sulfate 5 mg intravenously administered if pain score was greater than 5.Ultimately, at 60 min, morphine sulfate 5 mg intravenously injected again if any degree of pain. Additional doses of opioides were used if no response to last drugs. With pain intensity equal or less than 2 score, each patient was dischargeable based on situation. During study, probable side effects were observed. At the end, we evaluated recorded information in SPSS software and analyzed them by *"Paired t test"* (p-value<0.05).

3. Results

Seventy patients were evaluated in this study including 12 female (17.1%) and 58 male (82.8%) with mean age 33.7±10.1**.** In this study, Mean and Standard deviation of pain score in 0, 15, 30, 45 and 60 minutes was represented in Table1.

Table-1

Pain minute	n	Min	Max	$\overline{X}$	SD
Pain0	70	10	10	10	0.0
Pain 15	70	1	10	8.1	1.66
Pain 30	70	1	10	5.95	1.65
Pain45	70	1	7	4.32	1.4
Pain60	70	1	5	2.04	0.99

Two patients (2.8%) in 30 min have no pain and discharged home in 60 min without sodium diclofenac or morphin sulfate administration. Others received 75 mg diclofenace IM in 30 min that 21 patients (30%) have no pain in 60 min and discharged without opioid injection. During study, 47 patients (65.7%) were given opioid. From this,14 patients had pain score greater than 5 in 45 min and received 5 mg morphin IV but only one person have no pain in 60 min and in 13 patients (18.5%) was administered second dose of morphin in 60 min.34 patients received one dose of morphin (48.5%) alone. There is no side effect during study.Comparison of pain score in zero and 30 min (efficacy of desmopressin alone) with "paired t test" showed significant results (p-value <0.00001). (Table-2).

Table-2

Time	$\overline{X}$	SP	p-value
0	10	0.0	0.00001
30	5.95	1.65	

Also, results of comparison of pain score decrease in zero and 45 min and between 30 and 45 min (synergism of desmopressin and sodium diclofenace together with no opioid) was significant (p-value < 0/00001).(Table-3,4)

Table-3

Time	$\overline{X}$	SD	n	p-value
T_0	10	0	68	0.00001
T_{45}	4.42	1.29	68	

Table-*4*

Time	$\overline{X}$	SD	n	p-value
T_{30}	6.1	1.43	68	0.00001
T_{45}	4.4	1.29	68	

4. Discussions

It has been suggested that an antidiuretic hormone[24] (ADH)-induced decrease in diuresis could contribute to the rapid relief of pain in renal colic.[8, 9-12] Desmopressin is a synthetic structural analog of ADH. Compared with ADH, it has a greater antidiuretic effect, a longer duration of action, and reduced vasopressor activity. It is a first-line drug for replacement therapy in central diabetes insipidus and in the treatment of nocturnal enuresis.[13-15] The mechanism by which desmopressin relieves acute renal colic pain is unclear, but probably manifold.[11] The antidiuretic effect of desmopressin is probably responsible for its efficacy in the treatment of renal colic.[11,17] Desmopressin suppresses the spontaneous contractions of circular smooth muscle fibers in the renal pelvis of rabbits.[18]The same effect might be possible in humans. Some investigators have reported on the role of desmopressin in stimulating the secretion of B-endorphins by the hypothalamus, which could explain a possible additional central

analgesic effect of the drug.[19] A central mechanism in producing an analgesic effect could also be a valid hypothesis. Whether this therapy significantly affects eventual stone passage is unknown. It is available as a nasal spray (usual dose of 40 mcg, with 10 mcg per spray) and as an intravenous injection (4 mcg/mL, with 1 mL the usual dose) .DDAVP Nasal spray delivers 500 mcg doses. For 10 mcg dose, administer in one nostril. Any solution remaining after 50 doses should be discarded. Pump must be primed prior to first use. The biphasic half-lives for intranasal DDAVP are 7.8 and 75.5 minutes for the fast and slow phases. Generally,only one dose is administered.[25] Studies using desmopressin therapy for up to a few years have shown no toxic reactions or significant changes in laboratory values[20].

Ahmed E. El sheriff and et al[6,] Evaluated a total of 18 patients with acute renal colic due to stone disease that received 40 microgram desmopressin intranasal spray with encouraging results. There was a significant decrease in the colic pain intensity from an initial mean visual analogue score of 67 plus/minus 17 mm. to 39 plus/minus 36 mm within 30 minutes (p less than 0.001). Eight patients (44.4 percent) had complete pain relief within 30 minutes of administering intranasal desmopressin spray. Nine of 10 patients who required intramuscular diclofenac sodium achieved complete pain relief within another 30 minutes. In other words, when intranasal desmopressin spray was administered before diclofenac sodium, 94.4 percent of the patients achieved complete pain relief and were discharged home.

Constantinides .*C* et al[*21*] after a study concluded that the simplicity and effectiveness of intranasal desmopressin spray in treating renal colic makes this simple method a useful means of confronting a frequent and disturbing urological problem.

T. LOPES, J.S et al[*20*] assessed the efficacy of desmopressin nasal spray compared with diclofenac given intramuscularly in patients with acute renal colic caused by urolithiasis. The study included 61 patients randomized into three different groups; group A received desmopressin (40 mg, nasal spray), group B diclofenac (75 mg) intramuscularly and group C, both desmopressin and diclofenac. Pain was assessed using a visual analogue scale (a 10-cm horizontal scale ranging from `no pain' to `unbearable pain') at baseline, 10, 20 and 30 min after administering the treatments. Results On admission, the pain level was the same in all three groups. At 10 min the pain decreased in all groups to a level that was not significantly different. At 20 min groups B and C had similar mean pain levels (3.7), whereas in group A it was 5.0. At 30 min, groups B and C scored 2±3, and group A 5.6. All three treatments were equally effective at 10 and 20 min but at 30 min there was a stabilization/slight increase in pain level in group A.

Pourmund .G et al[22] in a clinical trial study, from Feb 1997 to Mar 1998, assessed 60 patients (21 male and 39 female with mean age of 36.3 years) who presented with acute Renal colic to emergency ward and received no medication enrolled in this study. Due to ethical law no control group could be selected. The pain severity was taken by percent with patient's permission. The pain intensity was between 0% (no pain at all) to 100% (the most severe pain ever imagined).40 microgram intranasal DDAVP started and pain severity evaluated at 10, 20, and 30 min. Side effects were noted. If the patient's pain did not subside after 30min, 75 mg diclofenac was administered intramuscularly; if this was Ineffective the patient was admitted to the ward and narcotics was administered (morphine or prthedine) .The mean of pain severity was 89% in our patients with renal colic. After 30 minutes 30 patients (50%) had no pain. In 15 patients the pain decreased significantly. The mean pain intensity was 30.66% ($p<0.00l$), and no other medication was used. Fifteen patients (25%) had some degree of pain (mean 54%, $p<0.05$), which was significantly decreased, but needed to use diclofenac or narcotics to relieve pain. None of them continued to have loin pain to necessitate admission to the emergency ward. The patients reported no side effects.

Abdol-Reza Kheirollahi et al[*23*] in a clinical trial,Studied analgesic effect of hyoscine N-butyl bromide and desmopressin combination in comparison with hyoscine N-butyl bromide alone in patients with acute renal colic induced by urinary stones. In The study included 114 patients randomly allocated in two groups (A and B). Patients in group A received 20 mg intramuscular hyoscine N-butyl bromide at admission time and patients in group B received 20 µg of intranasal desmopressin in combination with 20 mg intramuscular hyoscine N-butyl bromide. A visual analogue scale (VAS; a 10-cm horizontal scale ranging from "zero or no pain" to "10 or unbearable pain") was hired to assess the patients' pain severity at baseline, 30 and 60 minutes after the treatments. On admission, the pain level was similar in both groups (group A: 8.95 ± 0.11 and group B: 8.95 ± 0.12). In group A, the mean of pain level showed a decrease after 30 minutes (group A: 7.26 ± 0.25 and group B: 5.95 ± 0.28) but further decreasing did not occur; however in group B, the pain consistently decreased and the mean after 60 minutes was significantly decreased (group A: 6.80 ± 0.31 and group B: 3.71 ± 0.31). No side effects were detected in this study.

Roshani.A et al[24] determined the effect of the combination of intranasal desmopressin spray and diclofenac sodium suppository on acute renal colic and compare it with diclofenac sodium suppository assessed a total of 150 patients aged 15-65 years referred to their hospital with acute renal colic were included in a double-blind controlled clinical trial study. Patients in group 1 received desmopressin, 40 micg intranasally plus diclofenac sodium suppository 100 mg and patients in group 2 received diclofenac sodium suppository 100 mg plus a placebo spray consisting of normal saline 0.9%. Significant differences were found in the pain scores at 15 and 30 minutes between the 2 groups (P <.05). Also, significant differences were found in the mean pain scores in the first 15 and first 30 minutes after treatment between the 2 groups (P < 0.05). Of the patients in group 1, 37.3% had no pain relief and required pethidine. However, this rate in group 2 was 69.3%. In 17 cases, they prescribed pethidine within 20 minutes after treatment, and these patients were excluded from their study.

Also, results of our study showed that DDAVP administration (40 micg intranasal spray) can cause effective pain relief in acute renal colic and its association with sodium diclofenac resulting in better and more relief of pain with no need or low dose of morphin that ultimatly may cause early discharge and more satisfaction for patient.

Desmopressin acts quickly, has no apparent adverse effects, reduces the need for supplemental analgesic medications, and may be the only immediate therapy necessary for some patients .While some of the human studies lack adequate controls and further studies must be conducted, desmopressin therapy currently appears to be a promising alternative or adjunct to analgesic medications in patients with acute renal colic, especially in patients in whom narcotics cannot be used or in whom the pain is unusually resistant to standard medical treatment.

Other issues which need to be explored include: confirmation of last studies, the optimum dosage, method of use (i.e. in an ambulatory setting), whether there is a reduction in the need for diagnostic or therapeutic interventions and whether it reduces the rate of hospital admissions. That there seem to be some patients who do not respond or respond only minimally to desmopressin needs further clarification; characteristics should be identified in this group which might explain their lack of response.

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The Effect of Oral Zinc Sulfate on Hepatitis B Vaccine immunogenicity in Premature Infants

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Abstract: The immune system in premature neonates is weaker compared to mature ones. Zinc is a micro-nutritive, which plays an important role in the immune system .It can function as an adjuvant to improve the effectiveness of some vaccines. Neonate receive zinc in the third trimester of pregnancy, so the preterm neonate cannot receive it adequately and they have less storage for zinc. This study was conducted on 106 premature neonates. They were divided randomly into two groups of zinc taking and control group (n=53,each group). The first group received 3mg zinc sulfate for 6 months. Hepatitis B vaccination was performed for both groups. One month after the last vaccination for hepatitis B, the antibody titer for both groups was examined. In the zinc taking group, the response level(Antibody titer > 0.1µu/ml) to hepatitis B vaccine was 100% with the mean antibody of 236±443.5 µu/ml, but in control group the response level was 86.8% with the mean antibody of 170±205 µu/ml. There was a significant difference between the response level of intervention and control group (P=0.006); but there was not any significant difference in the average of antibody titer (P=0.328). Zinc can be used in premature infants to increase their response to hepatitis B vaccination. **The Effect of Oral Zinc Sulfate on Hepatitis B Vaccine immunogenicity in Premature Infants** *Life Sci J* 2012;9(4):3359-3361] (ISSN:1097-8135). http://www.lifesciencesite.com. 496

Keywords: Premature, Zinc Sulfate, Hepatitis B, Antibody

Introduction

Premature infants are subject to higher risk of mortality and infectious diseases more than mature ones. 13 million premature infants are born annually, most of which are in Asia (54%) and Africa (31%) [1]. Premature infants and infants with low birth weight (LBW) are zinc deficient because of low body storage, and this is because of the fact that 60% of zinc enters the infants' body during the last three months of pregnancy [2]. On the other hand, zinc is a microelement with a great impact of the growth and strength of the immune system in the body. In addition to weakening the immune system, zinc deficiency causes hormone and endocrine disorder and as a result, it causes physical and mental growth retardation [2, 3, 4]. In addition, zinc functions in producing 100 different enzymes in the body[5]. All kinds of immune cells show decreased function after zinc depletion. In such situation, all functions related to monocytes and T cells are impaired, in natural killer cells and neutrophils cytotoxicity activity and phagocytosis is reduced, respectively. However, auto-reactivity and all reactivity will increase [6]. The immune system in premature infants does not evolve adequately, so these infants are subject to different viral and bacterial infections and mortality resulted from them. Besides, the ability to respond the vaccination in premature infants is less than mature ones [7,8]. The premature infants less than 2000g birth weight do not respond adequately to hepatitis B vaccine, so 4 doses of vaccine at the time of birth, 1st month, 2 months and 6 months old is injected [9,10]. Hepatitis B vaccine immunogenicity in premature infants is variant depending fetus birth age and weight**. In order to improve the immunogenicity of vaccination, different methods such as changes in vaccination method and adding supplements such as, levamisole, cimetidine, zinc sulfate and some other drugs have been investigated** [11]. There are large number of studies investigating the different methods for increasing the immune response after vaccination such as use of different adjuvants (such as Levamisole, Cimetedine and Zinc sulfate), different methods of vaccination (whether intradermal or intramuscular as well as rapid or conventional methods). For example, vaccination via the intradermal route (ID) is considered as a method that may be more effective than the conventional intramuscular (IM) route [12] However, such general belief is not supported by findings from all studies [13]. Different groups of people are subject to zinc deficiency like premature infants, the elderly, vegetarians and nephropathies (renal patients) (6). By considering the fact that the immune system in premature infants does not evolved completely, so in this paper the effect of zinc sulfate on antibody value and response after injecting hepatitis B vaccine studied in premature infants.

Methods and materials

This study is a clinical experience conducted in the hospitals related to Kermanshah medical school (Imam Reza and Mo'tazedi hospitals). First 146 premature neonates with the gestational age of 28-36 week and birth weight between1000-2500 gram

investigated, and finally because of the lack of parents' cooperation, 106 infants investigated to the end of the study. The criteria to enter the study include HBSAg of the mother being negative (based on the tests done in pregnancy care), no congenital sepsis or anomaly in the infants not affected by any diseases during the study period, and only breast feeding of the infants.

The gestational age of each infant was determined according to mother's LMP and Ballard scoring system. The socio-Economical conditions of the families in both groups were the same. An information form, in which the sex, weight, height, head circumference at the time of birth and parent's phone number were included, was supplied for each infant. In the case of parents' satisfaction to conduct the study and cooperation to the end of the research, the infants were divided into 2 groups of zinc-takers and control group (n=53 each group) randomly. A written consent was taken separately from the parents .If an infant did not take the zinc sulfate syrup regularly each day, they were excluded from the study. The zinc-taking group received 3mg equal to 3cc zinc sulfate syrup (Made in Iran,Razak Company,5mg/5cc) daily.

Both zinc taking and control groups were evaluated and examined monthly, to the end of 7 months old. Hepatitis B vaccine (Hepavax, Korea) was injected deep intra-muscular for both groups based on national routine for about 0.5cc on the upper-anterior part of the thigh. For both groups, the infants less than 2kg weight received an extra hepatitis B vaccination in one month old. During the study, if an infant suffered from a disease which needed hospitalization, or he/she did not take the syrup daily and regularly, they were excluded from the study. One month after the last hepatitis B vaccination, 1cc blood clot was taken from the infants and hepatitis B antibody titer was calculated using competitive Eliza method (Biomerieux, USA) in Imam Reza hospital laboratory, and the data collected was analyzed statistically using SPSS17 software. To compare the antibody titer and other variables in both groups, t-test and levene's test were used.

Results

First, 146 premature infants entered the study, but because of the lack of parent's cooperation to the end of the study, dispensing with bloodletting, 3 diarrhea and 4 pneumonic cases resulted in hospitalization of the control group and also irregular zinc taking, 53 infants in each group were investigated to the end of 7 months old. In zinc-taking group, there were 30 boys and 23 girls and in control group, there were 28 boys and 25 girls. There was not any significant difference between the fetus age, birth weight and sex of both groups. The average age and weight of birth for both groups is summarized in Table 1. Both groups were investigated for their response to hepatitis B vaccine and antibody titer and the results are shown in Table 2.

Table 1. Comparison of age and weight of birth among the two groups

Variable	With Zinc(n=53)	Without Zinc(n=53)	P- value
Age (weeks)	32.9±2.2	32.7±2.1	0.594
Weight (grams)	1867.9±358.7	1765.1±313.9	0.119

Table 2. Comparison of Antibody Titer to the end of 7 month: after hepatitis B vaccine prescription among the two groups

variable	With Zinc(n=53)	Without Zinc(n=53)	P- value
Average of Hepatitis B Antibody Titer	236±443.5	170±205	0.328
Immunity(%) (Antibody Titer > 0.1µu/ml)	100%	86.8%	0.006

During the study, there were four nausea and vomiting cases after taking zinc, rectified after it was recommended taking it with mother's milk, and no serious complication was observed because of taking zinc.

Discussion

In this study, 106 premature infants were investigated and there was not any significant difference between their age, sex and birth weight. The group under study received 3mg zinc sulfate syrup daily for 6 months but the control group did not take zinc. One month after the last hepatitis B vaccination, the antibody titer was evaluated and all of the infants taking zinc for 6 months, had acceptable antibody titer of over 0.1µu/ml and responded well to hepatitis B vaccination and didn't required to repeat vaccination; while only 86.8% of the infants who didn't receive zinc sulfate had an acceptable antibody titer, and there was a significant difference between two groups according to their response to vaccine (p=0.006).

In one study in Bangladish, 242 infant with the age of 33-40 weeks were investigated and they received 5mg zinc daily for 4 weeks alongside

pneumococcus heptavalent vaccine and after wards antibody titer was evaluated and showed that in the group under study. The 9-serotype antibody increased more than the control group [14]. Another study was done in India, CD_4 value increased in 5-7 years old children who received 10mg zinc daily for one month [15]. According to the results of one study the CD_4 value after DPT vaccination and polio injection in premature infants was lower than mature ones [16]. Several studies were conducted on hemodialysis patients and the HBS-AB level was evaluated after zinc prescription and hepatitis B vaccination. In a clinical experience, 50 people of over 40 years old ages who were HBC-Ab negative received 200mg zinc sulfate capsules for 30 days and after 3 hepatitis B vaccination, hepatitis B antibody titer was measured and it showed no difference with the control group [17]. In a study conducted on rats, the antibody response to hepatitis B vaccine was weaker in the group who had low zinc diet [18]. In one study the suppressive effect of zinc on antibody response to cholera toxin in children given the killed oral cholera vaccine was reported [19].

In another study a group of teenagers received 400mg zinc daily for 2 months before influenza vaccination, then influenza CD_3,CD_4 and CD_8 antibody titer was measured and there was no difference between them and control group [20].

Based on the findings in this study and the above researchers, studies it can be concluded that sulfate syrup prescription does not have any serious complications and on the other hand, it has a well-deserved effect on responding to hepatitis B vaccine in premature infants. Therefore, it is better to use zinc to increase immunogenicity and response to hepatitis B vaccine, especially in developing countries with the high rate of hepatitis B, in addition to the vitamins and the elements that the premature infants take routinely.

It is suggested that in later studies the serum level of zinc in premature infants and also the effect of zinc sulfate on immunogenicity of other vaccines and its long-term prescription effect on growth and evolutional-neural criteria in premature infants, to be evaluated.

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Causes the formation and nature of political movements in Bahrain

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Abstract: Bahrain Political movement is one of the main movements in the Middle East that has begun following recent popular uprisings in Tunisia and Egypt and some other countries in the Middle East and is calling political and social reforms in the country. In this paper we try beside searching dimensions of this political movement, answer to this question that what are formation causes and nature of this political movement?
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Keywords: Political movement, Bahrain Political movement, Middle East

Introduction:

Political movement in Bahrain is one of the main movements in the Middle East that has begun following recent popular uprisings in Tunisia and Egypt and some other countries in the Middle East and is calling political and social reforms in the country .In this paper we try beside searching dimensions of this political movement and its regional effects, answer to this question that what are formation causes and nature of this political movement?

A. Conceptual discussion

Social movement is one of the main organized collective actions that have emerged from the society that with favor or special discourse agitates or mobilizes part or all people of a country for changing or modifying aspects of social life (including political, cultural, economic, environmental, etc). In the new societies, social movements are as one of the intermediates groups that cause kind of collective intelligence and knowledge in a society or parts of it. It is through these movements that people in a society can keep or obtain their personal and social interests and rights and with movements' pressure on their society's power and political elites realize their political- social values and ideals and thus in this way take part in their society's historical action. Also these movements cause mental development and formation of an ideology or training new elites for the society that these people may be among the influential leaders in their society in the future.

There are different approaches for analyzing causes of social movement's emergence. Some of these approaches in analyzing formation causes of these movements emphasize on internal situation such as political, social, cultural and economic conditions of society and others emphasize on mental development and formation of a new ideology or emergence of political leaders. And other groups of researchers think that external factors and international system and globalization are effective in formation of these developments. But it seems that integrated approaches can better explain the formation causes of these movements, that is if we believe in a kind of interaction between the mind and object and between thought and social action, we should say that social action is as a result of change in the minds of actors and indeed any social action as a product of social movements is result of new thought growth of these actors but the thought is not emerge in the vacuum, but there is a kind of interaction between thought of actors and society's internal conditions that its production is a social action. But all these actions take place in a global environment, because in today's world with developing communicative technologies and nearness of societies to each other that are result of globalization trend, any kind of social action in the societies will be strongly influenced by this global environment. And so, for analyzing social movements three important factors are needed that include internal conditions of societies, ideologies and thoughts and at the end regional and global conditions that based on this we attempt analyze these movements and in analyzing the Middle East developments and especially Bahrain we should consider to these factors.

B. Bahrain's social- political situation

Bahrain is a relatively large island that is located in angle of west south of Asia in the Middle East region and Persian Gulf area. Bahrain Archipelago is composed of 35 large and small islands and with an area of equivalent to 659 square kilometer that the largest island of this country that is also its capital is called Manama. This country has no soil border with another country and is neighbor with Saudi Arabia from south and west and from east and south east with Qatar and with Iran from north. Bahrain's population is over than 690000 that about one third of them are foreigners. Of this total population about 83% are urban and others are rural.

Most of the Bahrain's populations are native Arabs. Islam is official religion of Bahrain and more than 98% of inhabitants of this country are Muslim and more than 70% of them are Shia. Political features of Bahrain are as follow:

Monopoly of political power and dependence

A monopoly of political power can be seen in Bahrain. Nature of political regime in Bahrain is kingdom and in action all of the three branches are under direct observation of Bahrain's Emir and Bahrain's Emir with the crown prince and the prime minister are governing the country. According to the constitution of Bahrain, this country's Emir is ruler and head of the country and the government is inheritance in his family and the eldest son of the Emir appoints as his successor by then Emir and generation to generation. He has the right to appoint or dismiss any governmental official. Judicial official and military officials are appointed by the Emir and prime minister is responsible for municipal elections that is done with cabinet approval (Kazemi Dinan: 1388, 193). From other hand dependence of Al Khalifa's regime to the west is one of the main factors of oppositions to Bahrain's kingdom system. And England in 1919 officially announced that Bahrain is its protectorate and after that Bahrain was governed under the supervision of a British counselor that this issue caused an unsuccessful uprising by Bahrain's people in 1951 that in which people were demanding expulsion of the British ruler of Bahrain. Also after independence (1971), dependence of Al-Khalifa's regime to new colonial i.e. America was continued and a contract in this field was sighed by the new government of Bahrain and America for the consolidation and expansion of using exiting facilities in Bahrain and this issue spread propaganda against the military presence of America in the region by Communists and dissidents.

Political limitations

Loss of political freedoms and exiting of closed political space is one of the features of Bahrain. So return of exiles , freedom of political prisoners, lifting the ban on formation of parties and religious – political activities, freedom of expression and press, stop arresting of liberals and abolition of censorship are the most important political demands of Bahrain's people and to fulfill these demands they repeatedly have uprisings. Apart from political – social limitations that have been imported to Bahrain's people by Bahrain's kingdom regime, Shiite in Bahrain are suffering from more restrictions (Kazemi Dinan, 1388: 210-211 and Akhavan 1390). Exiting political attitudes in Bahrain based on their nearness or farness to ruling structure have more or less freedom. In other words, although there are parties in Bahrain, this doesn't mean that there is freedom in this country and this country's king has very high rule in restricting political activities in this small country.

No warranty of the government to reform promises

Bahrain's people have upraised and struggled many times for obtaining more political freedom and limiting king's power. Their last uprising is in current year. Based on the obtained agreements between opposition's leaders and the king and the prime minister during the last popular uprising in the 90s, this country's government was obliged to establish a system of constitutional monarchy, establish parliamentary elections and grand political and religious freedoms and recognition of speech, and permitted drafting of the constitution and establishment of parliamentary system. This order was a part of a strategy that was seeking people's satisfaction in rendering Bahrain from an emirate to a monarchy from reforms. In 1999, the charter as a new social contract between Al-Khalifa and people was rendered well and was supported by most of the people. 98/4% in a national referendum that was held on February 2001 fourteenth and fifteenth voted to the mentioned charter. However, political trend was soon faced with a major disaster. A few days after referendum, the government of Bahrain in a surprising movement proposed a reformed version of constitution in 1973 that this amendment to the constitution would strip the power from parliament and also ultimately , the government of Bahrain after passing the crises and after negotiations and agreements didn't execute any of these demands and now after many years of the last agreement, the first and the most important demand of protestors is a constitutional monarchy in this country and free parliamentary elections that will lead to appointment of prime minister (www.khabaronline.ir,1390). And the main demand of protestors in Lolo square and political demands of Bahrain's people are changing the constitution, disappearing tribal and ethnic discriminations, returning exiles, the abolition of ban of parties formation and political social activities , freedom of express and press , stop arresting of liberals and abolition of censorship and also freedom of political prisoners.

Economic- social discriminations

In the case of economic situation, statistics also indicate to the wide spread discrimination in distribution of this country's national wealth. Since 1990s, unemployment has been the main factor of discontent, especially among the majority of society's population. Official statistics say that the rate of unemployment is 15%, while actual figures

especially among Shiite are much higher than this rate.

Social and economic problems such as unemployment, poverty and even health problems are increasing, in a way that most of the population of Bahrain are living in the poor villages around Manama and don't have allow to reside in residential and large area of ″Alrfa″. While the most part of the foreign countries' investment is done in this region that ruling family live in this place. A transient look to the condition of employment in the public section that is fully under government control shows that the condition is fully discriminatory (Motaghizadeh, 1384:140 and Hamidpour, 1390).

Despite this fact that this country's Shiite are the majority of people, but they always have been in the position of second class citizens. Government has adopted immigration policy in order to disturb the population equilibrium that this issue has always caused objection of Bahrain's people especially Shiite (Daghagh, 1389:15 and Hamidpour, 1390).

B) – Ideology of social movements in Bahrain

It can say in general that political streams in Bahrain have different nature such as Shiite and Sunni Islamists and liberal stream, social democrats and Arab nationalism. But the Shia movements have more strength and range. Despite the diversity of religion and ideology, all of them have a consensus in the fight against the totalitarian rule and defend from establishment of a democratic government in the country. On the other words, given that in the demands of Bahraini movement stress in on demanding equal rights and opposition with political monopoly power, so it is not only a religious movement. Hence despite Shiite are majority of protestors and majority of the Sunni because of comply with governance propose criticisms about government with a very gently conservative manner, but it must be said that Islamic movement in Bahrain is ultra-religious. In simple words, although religious trends have impact on demands of Bahraini movements (including Shiite and Sunni), but focus of these movements is not on religious and sectarian demands and in most of these movements we can see different ranges of Sunni and Shiite beside each other. All we can say, this series of movements with different orientation have created a large coalition against the ruling regime and its political monopoly.

There are many Shia groups in Bahrain and majority of people are supporting them. These groups include a wide variety of moderate, democratic and extremist. In total, there are 11 Shia groups in Bahrain that of course some of them are not considered major power. Islamic Consensus Population is the most prominent political party of Shia in Bahrain. This population that was established in 2001 is the main driving of objections between 1994 and 1998. And in recent objections (February 14, 2011) is Bahrain's main opposition party. Right movement and Ahrar movement that are activating with the aim of establishing freedoms and democracy movement beside of Islamic Consensus (Alvafagh islami) are the main and the largest movements of Bahraini opponent's movements.

In Bahrain apart from the Shia Islamist political conflict stream, there are also Sunni Islamic-political movements and secular social movements in the political arena. Though these currents have not been as critical as Shia groups for example Shiite populations of Islamic Consensus for Bahraini rulers, but they have important impact in the trend of Bahrain's political and social developments.

The main Sunni political activists that activate in Bahrain with religious trend are Ekhvanol Moslemin (Muslim Brotherhood) relatives, but parts of Sunni non-religious forces also are highly active with the incentive of defense of democracy and freedom. And indeed, sources of social uprisings in Bahrain are not only religious Islamists but these unrests also include objections and activities of liberals, nationalists and the leftists. Of these groups we can mention to the homeland liberation front and Alvaed Population and popular front for Bahrain's freedom and movement of defense of human rights (Bahrani, 1378:109).

C)-International and regional situations affecting Bahrain's developments

Bahrain has a special geopolitical situation that this issue causes that this country's development has special importance for big powers like America and region's conservative Arab governments like Saudi Arabia. Presence of America's fifth fleet in this country and presence of Saudi forces and the island shield forces associated with cooperation council in this country for suppression of opponents shows this issue clearly. The western governments including America in contact with Bahrain's development have to change their high stances about democracy and human rights and because of their own benefits don't pay attention to Bahrain's situation and support Bahrain's government in suppression of opponents . So, international conditions have created dual situations for Bahrain. From one hand global and regional development has intensified democratization and awakening wave in Bahrain and from other hand interests of current situations in Bahrain for the western governments have encouraged them to support this country. Admission of White House spokesman confirms this added dependency he says that "if it was not Bahrain's government assistance, by no means we were not able to remain and resist in the Persian Gulf". Presence of America's fifth naval

fleet in Bahrain is a crucial issue for Washington. About 3000 American military dependants are in Bahrain. They guide about 30 ships and 30000 sailors in the Persian Gulf and the Red Sea. Bahrain is one of the main America's allies in the Persian Gulf, so it is for this reason that any crisis in Bahrain is somewhat risky for Washington's regional interests (Mojtahedzadeh, 1373:197 and Hamidpour).

D) - Conclusions and future prospects

In total, Bahrain like other countries of Persian Gulf region during its history has witnessed different crises such as a crisis of legitimacy and identity crisis and identity crisis, efficiency identity, etc. political monopoly of ruling class, the lack of political freedom, development of social and economic discriminations between majority of the society and minority of ruling and continuous repression have provided the background for the growth of different political reformist currents that these groups despite their sectarian and religious attitudes are common in strengthening individual and social freedoms and strengthening democracy in the country. But regional and international conditions have provided a dual condition for Bahrain and has created opportunities and threats for growth of movement, because from one hand mottos of the west about growth of democracy and human rights in the region and new developments of the region has provided the context for strengthening people's pro-democracy uprisings , but on the other hand strategic and deep relations between benefits of the west with region's conservative governments has caused that exiting system in the world and the western governments are not wiling to support these developments and popular uprisings practically and in practice with breaking their slogans support democratization suppression in Bahrain. With regard to this dual and contradictious condition, it doesn't seem that Bahrain's developments easily reach to the desired results and finally with increasing popular pressures we will see some limited political reforms.

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The Effect of Oral Zinc Sulfate on Hepatitis B Vaccine immunogenicity in Premature Infants

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Abstract: The immune system in premature neonates is weaker compared to mature ones. Zinc is a micro-nutritive, which plays an important role in the immune system .It can function as an adjuvant to improve the effectiveness of some vaccines. Neonate receive zinc in the third trimester of pregnancy, so the preterm neonate cannot receive it adequately and they have less storage for zinc. This study was conducted on 106 premature neonates. They were divided randomly into two groups of zinc taking and control group (n=53,each group). The first group received 3mg zinc sulfate for 6 months. Hepatitis B vaccination was performed for both groups. One month after the last vaccination for hepatitis B, the antibody titer for both groups was examined. In the zinc taking group, the response level(Antibody titer > 0.1µu/ml) to hepatitis B vaccine was 100% with the mean antibody of 236±443.5 µu/ml, but in control group the response level was 86.8% with the mean antibody of 170±205 µu/ml. There was a significant difference between the response level of intervention and control group (P=0.006); but there was not any significant difference in the average of antibody titer (P=0.328). Zinc can be used in premature infants to increase their response to hepatitis B vaccination.

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Keywords: Premature, Zinc Sulfate, Hepatitis B, Antibody

Introduction

Premature infants are subject to higher risk of mortality and infectious diseases more than mature ones. 13 million premature infants are born annually, most of which are in Asia (54%) and Africa (31%) [1]. Premature infants and infants with low birth weight (LBW) are zinc deficient because of low body storage, and this is because of the fact that 60% of zinc enters the infants' body during the last three months of pregnancy [2]. On the other hand, zinc is a microelement with a great impact of the growth and strength of the immune system in the body. In addition to weakening the immune system, zinc deficiency causes hormone and endocrine disorder and as a result, it causes physical and mental growth retardation [2, 3, 4]. In addition, zinc functions in producing 100 different enzymes in the body[5]. All kinds of immune cells show decreased function after zinc depletion. In such situation, all functions related to monocytes and T cells are impaired, in natural killer cells and neutrophils cytotoxicity activity and phagocytosis is reduced, respectively. However, auto-reactivity and all reactivity will increase [6]. The immune system in premature infants does not evolve adequately, so these infants are subject to different viral and bacterial infections and mortality resulted from them. Besides, the ability to respond the vaccination in premature infants is less than mature ones [7,8]. The premature infants less than 2000g birth weight do not respond adequately to hepatitis B vaccine, so 4 doses of vaccine at the time of birth, 1st month, 2 months and 6 months old is injected [9,10]. Hepatitis B vaccine immunogenicity in premature infants is variant depending fetus birth age and weight**. In order to improve the immunogenicity of vaccination, different methods such as changes in vaccination method and adding supplements such as, levamisole, cimetidine, zinc sulfate and some other drugs have been investigated** [11]. There are large number of studies investigating the different methods for increasing the immune response after vaccination such as use of different adjuvants (such as Levamisole, Cimetedine and Zinc sulfate), different methods of vaccination (whether intradermal or intramuscular as well as rapid or conventional methods). For example, vaccination via the intradermal route (ID) is considered as a method that may be more effective than the conventional intramuscular (IM) route [12] However, such general belief is not supported by findings from all studies [13]. Different groups of people are subject to zinc deficiency like premature infants, the elderly, vegetarians and nephropathies (renal patients) (6). By considering the fact that the immune system in premature infants does not evolved completely, so in this paper the effect of zinc sulfate on antibody value and response after injecting hepatitis B vaccine studied in premature infants.

Methods and materials

This study is a clinical experience conducted in the hospitals related to Kermanshah medical school

(Imam Reza and Mo'tazedi hospitals). First 146 premature neonates with the gestational age of 28-36 week and birth weight between1000-2500 gram investigated, and finally because of the lack of parents' cooperation, 106 infants investigated to the end of the study. The criteria to enter the study include HBSAg of the mother being negative (based on the tests done in pregnancy care), no congenital sepsis or anomaly in the infants not affected by any diseases during the study period, and only breast feeding of the infants.

The gestational age of each infant was determined according to mother's LMP and Ballard scoring system. The socio-Economical conditions of the families in both groups were the same. An information form, in which the sex, weight, height, head circumference at the time of birth and parent's phone number were included, was supplied for each infant. In the case of parents' satisfaction to conduct the study and cooperation to the end of the research, the infants were divided into 2 groups of zinc-takers and control group (n=53 each group) randomly. A written consent was taken separately from the parents .If an infant did not take the zinc sulfate syrup regularly each day, they were excluded from the study. The zinc-taking group received 3mg equal to 3cc zinc sulfate syrup (Made in Iran,Razak Company,5mg/5cc) daily.

Both zinc taking and control groups were evaluated and examined monthly, to the end of 7 months old. Hepatitis B vaccine (Hepavax, Korea) was injected deep intra-muscular for both groups based on national routine for about 0.5cc on the upper-anterior part of the thigh. For both groups, the infants less than 2kg weight received an extra hepatitis B vaccination in one month old. During the study, if an infant suffered from a disease which needed hospitalization, or he/she did not take the syrup daily and regularly, they were excluded from the study. One month after the last hepatitis B vaccination, 1cc blood clot was taken from the infants and hepatitis B antibody titer was calculated using competitive Eliza method (Biomerieux, USA) in Imam Reza hospital laboratory, and the data collected was analyzed statistically using SPSS17 software. To compare the antibody titer and other variables in both groups, t-test and levene's test were used.

Results

First,146 premature infants entered the study, but because of the lack of parent's cooperation to the end of the study, dispensing with bloodletting, 3 diarrhea and 4 pneumonic cases resulted in hospitalization of the control group and also irregular zinc taking, 53 infants in each group were investigated to the end of 7 months old. In zinc-taking group, there were 30 boys and 23 girls and in control group, there were 28 boys and 25 girls. There was not any significant difference between the fetus age, birth weight and sex of both groups. The average age and weight of birth for both groups is summarized in Table 1. Both groups were investigated for their response to hepatitis B vaccine and antibody titer and the results are shown in Table 2.

Table1. Comparison of age and weight of birth among the two groups

Variable	With Zinc(n=53)	Without Zinc(n=53)	P- value
Age (weeks)	32.9±2.2	32.7±2.1	0.594
Weight (grams)	1867.9±358.7	1765.1±313.9	0.119

Table2. Comparison of Antibody Titer to the end of 7 month: after hepatitis B vaccine prescription among the two groups

variable	With Zinc(n=53)	Without Zinc(n=53)	P- value
Average of Hepatitis B Antibody Titer	236±443.5	170±205	0.328
Immunity(%) (Antibody Titer > 0.1µu/ml)	100%	86.8%	0.006

During the study, there were four nausea and vomiting cases after taking zinc, rectified after it was recommended taking it with mother's milk, and no serious complication was observed because of taking zinc.

Discussion

In this study, 106 premature infants were investigated and there was not any significant difference between their age, sex and birth weight. The group under study received 3mg zinc sulfate syrup daily for 6 months but the control group did not take zinc. One month after the last hepatitis B vaccination, the antibody titer was evaluated and all of the infants taking zinc for 6 months, had acceptable antibody titer of over 0.1µu/ml and responded well to hepatitis B vaccination and didn't required to repeat vaccination; while only 86.8% of the infants who didn't receive zinc sulfate had an acceptable antibody titer, and there was a significant difference between two groups according to their response to vaccine (p=0.006).

In one study in Bangladish, 242 infant with the age of 33-40 weeks were investigated and they received 5mg zinc daily for 4 weeks alongside pneumococcus heptavalent vaccine and after wards antibody titer was evaluated and showed that in the group under study. The 9-serotype antibody increased

more than the control group [14]. Another study was done in India, CD_4 value increased in 5-7 years old children who received 10mg zinc daily for one month [15]. According to the results of one study the CD_4 value after DPT vaccination and polio injection in premature infants was lower than mature ones [16]. Several studies were conducted on hemodialysis patients and the HBS-AB level was evaluated after zinc prescription and hepatitis B vaccination. In a clinical experience, 50 people of over 40 years old ages who were HBC-Ab negative received 200mg zinc sulfate capsules for 30 days and after 3 hepatitis B vaccination, hepatitis B antibody titer was measured and it showed no difference with the control group [17]. In a study conducted on rats, the antibody response to hepatitis B vaccine was weaker in the group who had low zinc diet [18]. In one study the suppressive effect of zinc on antibody response to cholera toxin in children given the killed oral cholera vaccine was reported [19].

In another study a group of teenagers received 400mg zinc daily for 2 months before influenza vaccination, then influenza CD_3,CD_4 and CD_8 antibody titer was measured and there was no difference between them and control group [20].

Based on the findings in this study and the above researchers, studies it can be concluded that sulfate syrup prescription does not have any serious complications and on the other hand, it has a well-deserved effect on responding to hepatitis B vaccine in premature infants. Therefore, it is better to use zinc to increase immunogenicity and response to hepatitis B vaccine, especially in developing countries with the high rate of hepatitis B, in addition to the vitamins and the elements that the premature infants take routinely.

It is suggested that in later studies the serum level of zinc in premature infants and also the effect of zinc sulfate on immunogenicity of other vaccines and its long-term prescription effect on growth and evolutional-neural criteria in premature infants, to be evaluated.

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Experimental Research of Flash Visual Evoked Potential of Chinese White Rabbit after Optic Nerve Injury

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Abstract: Objective: To investigate the changes of the Flash visual evoked potential (F- VEP) in China rabbit after the optic nerve injury. Methods: Changes of F-VEP in normal China rabbits and those after optic nerve injury were detected using TEC automatic visual electric physiological system. Results: Compared with that of the normal rabbits, the latency of F-VEP in optic nerve incomplete injury rats increased significantly, but the amplitude of F-VEP decreased significantly. "Silent pattern" wave form of F-VEP was found in optic nerve transected China rabbits. Conclusion: The model of China rabbits with optic nerve injury can be used for the investigation of the neuroprotective effect of optic nerves. Detection of the changes of F-VEP is an objective, reliable, and effective method for the examination of optic nerve functions.
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Keywords: China rabbits; Flash visual evoked potential

1. Introduction

The China White Rabbit in recent years were used more for scientific research of ophthalmology, but their normal visual electrophysiological properties is not clear, rarely reported in the literature(Cai,2009). We studied the Chinese White Rabbit flash visual evoked potential (F-VEP), to establish the range of normal value and the feature after optic nerve injury, with purpose to lay a foundation of further optic nerve damage repair research.

2 .Materials and Methods

2.1 Experimental animals

Chinese white rabbits, male half and female half, a total of 20 (Zhengzhou University Experimental Animal Center), body weight 250 to 260 g. Record the F-VEP of left eye, establish the normal value of latent time and the amplitude of Chinese White Rabbit F-VEP. The choice of which recorded in the 18 animals was chosen to record F-VEP 1 h after incomplete transection of the right optic nerve; F-VEP was recorded in the remaining two after optic nerve transection, in order to monitor the status of the optic nerve function after acute optic nerve injury.

2.2 Animal models of optic nerve injury

10% chloral hydrate was used to anesthetize rabbits by ear vein, fixed on the operating table with prone position. According to the position of the optic nerve of the rabbit eye, get close to the optic nerve from above the surface of the eye. Cut the bulbar conjunctiva in the 10:00~14:00 position of the cornea edge of the upper right eye, blunt separation of the bulbar conjunctiva to the rear ball, pull superior rectus to the below with a self tractor, expose and cut the superior rectus muscle, careful use of mosquito- clamp clamping 10 s at 2 mm after the ball and make injury by optic nerve crush. Optic nerve transection model as above, expose the superior rectus muscle, cut the cord-like optic nerve with bent-shaped tissue scissors , result in optic nerve transaction (Yan, 2012).

2.3 Recording method of F-VEP and stimulus parameters

Electrophysiological examination with reference to international clinical visual electrophysiological criteria, Chongqing Tektronix automatic visual electrophysiology system was used. Anesthetized animals fixed on the bench, homemade silver needle electrode (adapted from acupuncture needles) was used to guide the electrode inserted into the external occipital tuberosity below the periosteum from the midpoint of two ears attachment, reference electrode inserted into the forehead, below the periosteum at the midpoint of two eyes attachment, the ground electrode behind the right ear, recorded F-VEP after 15min of dark adaptation. white flash stimulus of full vision stimulator was used with colorless background, the pass-band low-frequency 75 Hz, high-frequency 0.1 Hz, stimulation pattern for single stimulation, frequency 2Hz, flash intensity 3.556e-3cd..s/m2, to stimulate 50 times, magnification of 100,000 times, each sampling time 500 ms, waveform overlay of 100 times, consecutive measurements at least five times, each

interval of 30min, Each animal recorded stable waveforms three times, Each animal inspection one eye, using self-made opaque black patch completely cover the contralateral eye.

2.4 The observed indicators

Harding nomenclature was used. The experiment recorded relatively stable N-P-N waveform of the F-VEP waveform ,records of each animal: N1 wave, P1 wave, N2 wave latency (ms) and N1-P1, P1-N2, wave amplitude (v). Measurement method: N1 peak latencies is from the start to N1 peak, P1peak latencies is from the start to the bottom of P1, and so on; N1- P1 amplitude is from the peak of the N1 to the bottom of P1, and so on. Each index value of computer automatic measurement, taking the average of three times to register.

2.5 Statistical analysis

The the SPSS 11.0 was used, t test was used for comparison among groups.

3. Results

3.1 normal white rabbit F-VEP

A typical N-P-N waveforms was seen in each rabbit, measured the average and calculated the variability index standard deviation and range. The results shown in Table 1.

Table 1. Normal rabbit F-VEP amplitude

F-VEP	N1	P1	N2	N1-P1	P1-P2
Average	26.13	46.10	95.10	15.10	35.10
Standard deviation	8.70	10.40	21.41	5.4	14.50

3.2 Chinese white rabbits of the F-VEP after optic nerve incomplete injury

measured the average and calculated the variability index standard deviation. Table 2 shows that the waveform change low and wide after optic nerve uncompletely damage. The incubation period of N1, P1, N2 prolonged significantly, peak N1-P1, P1-N2 amplitudes were reduced, and have significant difference from the normal (P <0 01).

Table 2 Chinese White Rabbit F-VEP amplitude of optic nerve contusion

F-VEP	N1	P1	N2	N1-P1	P1-P2
NORMAL	26.13±8.7	46.10±10.4	95.10±21.41	15.10±5.4	35.10±14.5
CRUSHED	66.73±19.63	131.2±30.22	191.30±55.28	8.1±3.5	8.9±2.2
P	＜0.01	＜0.01	＜0.01	＜0.01	＜0.01

4. Discussion

Visual evoked potentials is a bunch of electrical signals in the cerebral cortex to visual stimuli react, also known as visual evoked cortical potentials (VECP) or visual evoked response (VER)(Holmes, 2004). VEP with other visual electrophysiology can provide important diagnostic information on whether the function of the visual system is intact. F-VEP is a more mature and effective noninvasive method of visual functon status between the normal state and the disease process(Heiduschka,2005). Stimulation and recording methods between different laboratories, the F-VEP peak polarity, latency, amplitude is very different, yet there is no single standard value. Variability index standard deviation of the experiment is larger, indicating that the Chinese White Rabbit F-VEP variability and volatility is larger, the F-VEP in certain individual differences. We studied the F-VEP of Chinese White Rabbit, to establish the normal range and depending on the variation after the injury, to lay an experimental foundation for further clinical diagnosis and prognosis. Experiment to detect the F-VEP of normal and post optic nerve damage of China White Rabbit, leads to good reproducibility of the waveform, the F- VEP latency and amplitude of normal and post optic nerve damage of China White Rabbit was achieved.There are incomplete injury and complete injury types of traumatic optic nerve injury model. Complete injury include the myelin sheath damage of the optic nerve damage and no damage to the myelin sheath of the optic nerve. Incomplete optic nerve injury method is optic canal crush injury, optic indirect good, clamp contusion, crush injury, draw-off injury etc. Incomplete optic nerve injury is clinical common, we have established the most common and recognized more accurate optic nerve injury model to simulate the process of clinical optic nerve injury. 1h after optic nerve r injury F-VEP was measured with the contrast to normal eye. The results showed that the waveform becomes low and broad in incomplete optic nerve injury, the incubation period of N1, P1, N2, was significantly prolonged, peak of N1-P1, P1-N2 decreased significantly compared with the normal eye, there are significant differences. Experiments establish optic nerve transection model, Chinese White Rabbit F-VEP waveform basic after optic nerve transection was extinguished type, no significant peaks appear. The optic nerve injury is a

common type of ocular trauma, After the injury in time to understand vision is important index for guiding therapy and prognosis judgment, but the subjective visual inspection is often affected by many factors, and patients often accompanied with coma caused by brain trauma, therefore, F - VEP inspection as an objective index, is of great significance to guide the clinical treatment of ocular trauma. Zhu Yu et al. found through experimental and clinical research, application of the F-VEP in orbital surgery is reliable for optic nerve conduction function monitoring and can reduce the accident rate of blindness of the optic nerve injury, so that the surgical procedure from clinical experience anatomy to functional anatomy. F-VEP abnormalities reveals a high degree of optic nerve dysfunction, and can predict the size of the possibility of recovery. F-VEP is sensitive to the degree of response to optic nerve damage, in severe optic nerve damage the rate of decline of the F-VEP amplitude can be as a judgment of the visual acuity after injury and a prognosis of objective indicators. Record of this experiment to the normal Chinese White Rabbit typical F-VEP waveform, the peak of the optic nerve injury model significantly reduced, indicating that this animal model can be used to further observe the optic nerve protective effect of the study, and the F-VEP waveform changes in the optic nerve damage consistent with the visual information and is of great value for the understanding of the injury to the conduction of the visual cortex .With the continuous improvement and development of the F-VEP detection technology, it will be more valuable in the clinical application(Zhu,2011).

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The Protective Effect of Propolis on Norepinephrine, Dopamine and 5-Hydroxytryptamine Content in Thalamus-Hypothalamus and Cerebellum of Endotoxin-Intoxicated Adult Male Albino Rats

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Abstract: The present study was undertaken to investigate the effect of endotoxin (ET) on monoamines content in the thalamus-hypothalamus and the cerebellum of adult male albino rats and whether propolis (prop) can protect the brain during neuro-inflammation induced by ET. Seventy eight rats weighing 100-150g were divided into four groups. The first served as control group (6 rats) and were received a daily intraperitoneal (i.p) injection of saline solution (0.9% NaCl) for 15 consecutive days. The second group (24 rats); were received an i.p injection of 0.9% NaCl for 15 consecutive days, then received i.p injection of ET (1mg/kg/day) at the 16th day of experiment for 4 repeated days. The third group (24 rats); were received an i.p injection of prop (150mg/kg/day) for 19 consecutive days. The fourth group (24 rats); were administered prop by the same route as mentioned in the third group; then, the rats were received ET as described in the second group. Animals of all groups were decapitated 2 hours post-treatment at 16th, 17th, 18th and 19th days of experiment. ET treated-rats group showed a sharp decrease in norepinehrine (NE), dopamine (DA) and 5-hydroxytryptamine (serotonin, 5-HT) content in both thalamus-hypothalamus and cerebellum at all treatment days versus the control group, while administration of prop followed by ET injection was found to enhance monoamine levels significantly in both selected brain regions if compared to ET-treated group. The present results indicate the harmful neurotoxic effect of ET on the brain, while prop was found to inhibit the sharp decline in NE, DA and 5-HT in both investigated regions. This may reflect the protective property of prop as an anti-inflammatory natural product.
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Keywords: Endotoxin, lipopolysaccharide, propolis, monoamines, thalamus, hypothalamus, cerebellum, rats.

1. Introduction

Endotoxin is an inflammatory lipopolysaccharide (LPS) molecule from gram-negative bacteria that are ubiquitous in the door environment **(Thorne *et al.*, 2005)**. It is biologically effective even in lowest concentrations **(Todar, 2002)**. Bacterial DNA and LPS are potent activators of immune cells such as monocytes and macrophages which contribute to systemic inflammatory responses syndrome **(Hong *et al.*, 2004)**. Some key physiological responses of ET shock in man include fever, reduced blood pressure, metabolic acidosis and tissue damage was indicated after ET exposure **(Hodgson, 2006)**. **Coskun *et al.* (2005)** reported that ET injection produces renal damage, increased lipid peroxidation and decreased antioxidant enzyme activity. Moreover, several reports indicated that ET was accompanied by significant changes in neurotransmitter levels in different parts of the CNS **(Koulchitsky *et al.*, 2000; Dunn, 2005)** and causes neuronal damage **(Gao *et al.*, 2003).**

Propolis is a sticky resin that seeps from the buds of some trees and oozes from the bark of other trees. The bees gather prop and carry it home in their pollen baskets. They blend it with wax flakes secreted from special glands on their abdomens **(Gregory, 2002)**. It was found that prop is efficient against conditions caused by bacteria, viruses or different fungi. It cures many diseases because it is a special natural substance with strong effect. Moreover, prop possesses many biological activities such as antitumor, antioxidant, antimicrobial, anti-inflammatory and also immunomodulator **(Mani *et al.*, 2006).**

Tandon *et al.* (2006) indicated that NE, DA and 5-HT are biogenic amines that serve as neurotransmitters in a number of nerve pathways in the brain. NE is secreted by many neurons to help control the overall activity and mood of the mind, while DA acts as an inhibitory transmitter; whereas 5-TH acts as an inhibitor of pain pathways in the cord and its actions in the higher regions of the nervous system are believed to control the mood.

The present work aims to shed light on the disturbances in NE, DA and 5-HT after ET injection and the protective role of prop as a natural anti-inflammatory substance in lowering ET harmful neurotoxic effect on these amines in the thalamus-hypothalamus and cerebellum of adult male albino rats.

2. Materials and Methods:

Drug used:

Endotoxin was purchased from Sigma Chemicals Co. (St. Louis, MO, USA). Propolis was purchased from Holding Company for Biological Products & Vaccines (VACSERA), Giza, Egypt.

Experimental animals:

Adult male albino rats (*Rattus norvegicus*) weighing 100-150g were obtained from the Holding Company for Biological Products and Vaccines (VACSERA, Giza, Egypt). After acclimatization for a period of one week, animals were divided into four groups (6 rats per group) and housed in wire bottomed cages in a room under standard conditions of illumination with a 12-hours light-dark cycle. They were provided with water and a balanced diet *ad libitum*. All animals received care in compliance with the Egyptian rules for animal protection.

Rats were randomized and divided into four groups, one control of six rats and three treated groups each of 24 rats, each of which was subdivided into 4 subgroups six rats at each as follows:

Group 1: (The control group) in which animals received a daily i.p injection of normal saline solution (0.9%NaCl) for 15 consecutive days.

Group 2: (ET group), rats were received daily i.p normal saline solution (0.9%NaCl) for 15 consecutive days then followed by i.p injection of ET (1mg/Kg body weight) at the 16^{th}, 17^{th}, 18^{th} and 19^{th} days of the experiment.

Group 3: (Prop group), rats were received an aqueous extract of 10% prop (1gm of prop soaked for several days in 9ml distilled water then filtered through a clean and very fine filter paper **(Krell, 1996)**. Animals of this group were received a daily i.p injection of prop (150mg/kg body weight) for 19 consecutive days.

Group 4: (prop and ET group), rats were received a daily i.p injection of prop as shown in group 3, while the treatment of ET in combination with prop injection was carried on the 16^{th},17^{th}, 18^{th} and 19^{th} days of experiment as described in the second group.

Methods:

Animals of all groups were killed by fast decapitation two hours after the last dose, at the 16^{th}, 17^{th}, 18^{th} and 19^{th} days of the experiment. The brains were carefully removed, blotted and frozen. Dissection was performed on ice-cold glass plate for the separation of the thalamus-hypothalamus and cerebellum regions from the brain within one minute according to the method of **Glowinski & Iversen (1966).**

Estimation of NE, DA and 5-HT was undertaken according to the flourimetric method described by **Ciarlone (1978).**

Statistical analysis:

Results were expressed as the mean ± standard error of the mean. Data for multiple variable comparisons were analyzed by one-way analysis of variance (ANOVA). For the comparison of significance between groups, **Duncan's test (1955)** was used as post hoc test according to the statistical package program (SPSS version 8). Percentage difference representing the percent of variation with respect to the control group was also calculated.

3-Results

The present data concerning the influence of i.p injection of ET and/or prop on monoamines content are presented as follows: Table (1) to (6) revealed that, ET injection caused a sharp and highly significant decrease at $p<0.001$ in NE, DA and 5-HT levels in the thalamus-hypothalamus and cerebellum of adult male albino rats at all time intervals of experiment as compared to control group.

The illustrated data in tables (1) and (2) concerning prop group indicated an increase in the NE content in thalamus-hypothalamus and cerebellum at 16^{th}, 17^{th}, 18^{th} and 19^{th} days of treatment with respect to control group. The increase in NE content in the thalamus-hypothalamus was of a significant change at $p<0.05$, while in the cerebellum was of a significant change at $p<0.001$ with a percentage difference of 31.6%, 26.3%, 42.1% and 26.3%, respectively. On the other hand, tables (3-6) revealed that, prop treated-rats showed a significant decrease in DA and 5-HT contents in both examined regions at all time intervals of the experiment with respect to control group.

As depicted from tables (1) to (6), injection of ET to prop-treated rats showed significant decreases in NE, DA, and 5-HT levels at $p<0.001$ in thalamus-hypothalamus and cerebellum at the 16^{th}, 17^{th}, 18^{th} and 19^{th} days of treatment except at the 17^{th} day, the NE levels in the thalamus-hypothalamus showed a slight and non significant decrease as compared to control group. On the other hand, the levels of NE, DA and 5-HT indicated a significant enhancement in both thalamus-hypothalamus and cerebellum versus ET-treated group at all days of the experiment indicating the protective role of prop against ET effect. Meanwhile, prop & ET-treated rats group revealed a highly significant decrease in NE, DA and 5-HT levels at $p<0.001$ in both the thalamus-hypothalamus and cerebellum at the 16^{th}, 17^{th}, 18^{th} and 19^{th} days of treatment versus prop-treated group.

Table (1): Effect of intraperitoneal injection of endotoxin (1mg/kg b.wt.) and/or propolis (150mg/kg b.wt.) on norepinephrine content (µg/g tissue) in thalamus-hypothalamus of adult male albino rats at the 16th, 17th, 18th and 19th days of treatment; the number of animals was 6 in each group. Data are expressed as mean ± SE.

Experimental Days	Experimental Groups (Mean ± SE)			
	Control	ET	Prop	Prop & ET
16th	0.35±0.01	0.16±0.01 (-54.3)a**	0.38±0.01 (8.6)a	0.28±0.003 (-20.0)a**b**c**
17th		0.24±0.01 (-31.4)a**	0.40±0.01 (14.3)a	0.34±0.01 (-2.9)b**c**
18th		0.08±0.003 (-77.1)a**	0.37±0.01 (5.7)a	0.25±0.10 (-28.6)a**b**c**
19th		0.17±0.01 (-51.4)a**	0.37±0.02 (5.7)a	0.19±0.003 (-45.7)a**bc**

a: Significant change at $p < 0.05$ with respect to control group. b: Significant change at $p < 0.05$ with respect to endotoxin group.
c: Significant change at $p < 0.05$ with respect to propolis group. * - ** changes between $p < 0.01$ - $p < 0.001$.
( ): % difference with respect to control value

Table (2): Effect of intraperitoneal injection of endotoxin (1mg/kg b.wt.) and/or propolis (150mg/kg b.wt.) on norepinephrine content (µg/g tissue) in cerebellum of adult male albino rats at the 16th, 17th, 18th and 19th days of treatment; the number of animals was 6 in each group. Data are expressed as mean ± SE.

Experimental Days	**Experimental Groups** (Mean ± SE)			
	Control	**ET**	**Prop**	**Prop & ET**
16th	0.19±0.01	0.05±0.003 (-73.7)a**	0.25±0.01 (31.6)a**	0.07±0.003 (-63.2)a**b**c**
17th		0.07±0.001 (-63.2)a**	0.24±0.01 (26.3)a**	0.097±0.003 (-48.9)a**b**c**
18th		0.03±0.002 (-84.2)a**	0.27±0.01 (42.1)a**	0.06±0.001 (-68.4)a**b**c**
19th		0.10±0.01 (-47.4)a**	0.24±0.01 (26.3)a**	0.15±0.005 (-21.1)a**b**c**

a: Significant change at $p < 0.05$ with respect to control group. b: Significant change at $p < 0.05$ with respect to endotoxin group.
c: Significant change at $p < 0.05$ with respect to propolis group. * - ** changes between $p < 0.01$ - $p < 0.001$.
( ): % difference with respect to control value

Table (3): Effect of intraperitoneal injection of endotoxin (1mg/kg b.wt.) and/or propolis (150mg/kg b.wt.) on dopamine content (µg/g tissue) in thalamus-hypothalamus of adult male albino rats at the 16th, 17th, 18th and 19th days of treatment; the number of animals was 6 in each group. Data are expressed as mean ± SE.

Experimental Days	**Experimental Groups** (Mean ± SE)			
	Control	**ET**	**Prop**	**Prop & ET**
16th	3.84±0.01	1.77±0.03 (-53.9)a**	3.53±0.02 (-8.1)a**	3.02±0.03 (-21.4)a**b**c**
17th		2.86±0.05 (-25.5)a**	3.54±0.01 (-7.8)a**	3.45±0.02 (-10.2)a**b**c**
18th		1.28±0.02 (-66.7)a**	3.51±0.01 (-8.6)a**	2.10±0.03 (-45.3)a**b*c**
19th		2.53±0.02 (-34.1)a**	3.53±0.02 (-8.1)a**	2.97±0.08 (-22.7)a**b**c**

a: Significant change at $p < 0.05$ with respect to control group. b: Significant change at $p < 0.05$ with respect to endotoxin group.
c: Significant change at $p < 0.05$ with respect to propolis group. * - ** changes between $p < 0.01$ - $p < 0.001$.
( ): % difference with respect to control value

Table (4): Effect of intraperitoneal injection of endotoxin (1mg/kg b.wt.) and/or propolis (150mg/kg b.wt.) on dopamine content (µg/g tissue) in cerebellum of adult male albino rats at the 16th, 17th, 18th and 19th days of treatment; the number of animals was 6 in each group. Data are expressed as mean ± SE.

Experimental Days	**Experimental Groups** (Mean ± SE)			
	Control	**ET**	**Prop**	**Prop & ET**
16th	2.90±0.03	1.05±0.01 (-63.8)a**	2.57±0.02 (-11.4)a**	1.27±0.01 (-56.3)a**b*c**
17th		1.70±0.02 (-41.4)a**	2.54±0.02 (-12.4)a**	2.06±0.01 (-29.0)a**b**c**
18th		0.60±0.02 (-79.3)a**	2.60±0.01 (-10.3)a**	1.09±0.01 (-62.4)a**b**c**
19th		0.96±0.02 (-66.9)a**	2.58±0.01 (-11.0)a**	1.76±0.01 (-39.3)a**b**c**

a: Significant change at $p < 0.05$ with respect to control group. b: Significant change at $p < 0.05$ with respect to endotoxin group.
c: Significant change at $p < 0.05$ with respect to propolis group. * - ** changes between $p < 0.01$ - $p < 0.001$.
( ): % difference with respect to control value

Table (5): Effect of intraperitoneal injection of endotoxin (1mg/kg b.wt.) and/or propolis (150mg/kg b.wt.) on serotonin content (µg/g tissue) in thalamus-hypothalamus of adult male albino rats at the 16th, 17th, 18th and 19th days of treatment; the number of animals was 6 in each group. Data are expressed as mean ± SE.

Experimental Days	Experimental Groups (Mean ± SE)			
	Control	ET	Prop	Prop & ET
16th	5.78±0.03	1.63±0.02 (-71.8)^{a**}	5.19±0.07 (-10.2)^{a**}	2.39±0.02 (-58.7)^{a**b**c**}
17th		2.58±0.02 (-55.4)^{a**}	5.28±0.02 (-8.7)^{a**}	3.23±0.02 (-44.1)^{a**b**c**}
18th		1.22±0.02 (-78.9)^{a**}	5.19±0.07 (-10.2)^{a**}	1.73±0.06 (-70.1)^{a**b*c**}
19th		2.36±0.02 (-59.2)^{a**}	5.14±0.09 (-11.1)^{a**}	3.06±0.02 (-47.1)^{a**b**c**}

a: Significant change at $p < 0.05$ with respect to control group. b: Significant change at $p < 0.05$ with respect to endotoxin group.
c: Significant change at $p < 0.05$ with respect to propolis group. * - ** changes between $p < 0.01$ - $p < 0.001$.
( ): % difference with respect to control value

Table (6): Effect of intraperitoneal injection of endotoxin (1mg/kg b.wt.) and/or propolis (150mg/kg b.wt.) on serotonin content (µg/g tissue) in cerebellum of adult male albino rats at the 16th, 17th, 18th and 19th days of treatment; the number of animals was 6 in each group. Data are expressed as mean ± SE.

Experimental Days	Experimental Groups (Mean ± SE)			
	Control	ET	Prop	Prop & ET
16th	3.04±0.01	0.51±0.01 (-83.2)^{a**}	2.81±0.03 (-7.6)^{a}	0.62±0.02 (-79.6)^{a**bc**}
17th		0.95±0.02 (-68.8)^{a**}	2.77±0.02 (-8.9)^{a}	1.52±0.02 (-50.0)^{a**b**c**}
18th		0.49±0.01 (-83.9)^{a**}	2.86±0.02 (-5.9)^{a}	0.60±0.02 (-80.3)^{a**b*c**}
19th		1.26±0.01 (-58.6)^{a**}	2.79±0.01 (-8.2)^{a}	1.61±0.02 (-47.0)^{a**b**c**}

a: Significant change at $p < 0.05$ with respect to control group. b: Significant change at $p < 0.05$ with respect to endotoxin group.
c: Significant change at $p < 0.05$ with respect to propolis group. * - ** changes between $p < 0.01$ - $p < 0.001$.
( ): % difference with respect to control value

4. Discussion

Results of the present study revealed sharp decreases in the levels of NE, DA and 5-HT in the thalamus-hypothalamus and cerebellum of ET-treated rats at all time intervals of the experiment, if compared to control group. These results are in agreement with **Masana *et al.* (1990); Dunn (1992) and Koulchitsky *et al.* (2000)**.

Masana *et al.* (1990) indicated elevated levels of NE at 4, 8 and 24 hour following LPS injection (20µg/rat) with an increased level of DA metabolite in the striatum, hypothalamus and medulla oblongata**. Dunn (1992)**, found that i.p injection of LPS activated cerebral catecholamine and the hypothalamo-pituitary adrenocortical axis; increased mouse brain concentration of NE catabolite, 3-methoxy,4- hydroxyphenyl ethylene glycol; increased the DA catabolite, 3,4-dihydroxy phenyl acetic acid; increased the 5-HT catabolite, 5-hydroxy-indole acetic acid and tryptophan in all brain regions examined. Moreover**, Koulchitsky *et al.* (2000)** reported significant changes in 5-HT, NE, histamine, kininis and gamma aminobutyric acid catabolism in different parts of CNS at the initial phase reaction of ET treatment.

As an environmental inflammation-inducer LPS has been shown as a potent microglia activator and neurotoxin *in vitro* and *in vivo* studies **(Arimoto & Bing, 2003).** LPS elicits responses similar to that after interleukin-1, either used peripherally or centrally as it induces NE release in the brain most markedly in the hypothalamus, accompanied by small changes in brain DA **(Dunn 2005)**. The author added that both bacterial and viral infections induce hypothalamic pituitary axis activation and also increased brain NE, 5-HT metabolism and brain tryptophan. LPS has been reported to stimulate the secretion of pro inflammatory mediators and cytokines **(Erickson & Banks, 2011)** indicating the induction of neuro-inflammation. Neuro-inflammation is important in the pathogenesis and progression of Alzheimer disease as it causes memory impairments and disturbance in monoamine release **(Lee *et al.*, 2012).** Moreover, microglia, the major resident immune cells in the brain, switch to an activated phenotype in response to pathogen invasion or tissue damage and thereby promote an inflammatory response including release of free radicals, cytokines and lipid metabolites **(Glass *et al.*, 2010),** which in turn trigger a neuro-degenerative

cascade via neuro-inflammation **(Qiuntanilla *et al*., 2004**).

Recently, **Kaneko *et al*. (2012)** examined the regulation of activated microglia through their cell death and survival pathways. The authors suggested that long-lived microglia resulting from exposure to the optimal dose of LPS may play critical role in the progression of neurodegeneration. **Pocock and Kettenmann (2007**) indicated that, catecholamine NE is a classical neurotransmitter with suggested immunomodulatory properties released by neurons into the synaptic cleft and may exert effects on glia cells. NE may also have an immune suppressive role as it attenuates LPS-induced microglial production of tumor necrosis factor (TNF-α) interleukin-6 and nitric oxide and reduces microglial-induced neuronal cell death **(Madrigal *et al*., 2005).**

Lately, **Dunn (2005)**, reported that many of the cytokines (most notably interleukin-1 and interleukin-6 act via the brain, resulting in the activation of the corticotropin releasing factor containing neurons in the hypothalamic paraventricular nucleus. The author suggested the ability of interleukin-1 and interleukin-6 to elevate circulating glucocorticoids as it is critical for the survival of the organism. It has become evident that there may exist a cross-talk between the autonomic nervous system and the immune system during inflammation **(Sternberg, 2006)**.

Systemic LPS treatment was found to mitigate methamphetamine-induced striatal DA and 3, 4-dihydroxyphenyl acetic acid depletions in a dose-dependent manner **(Lin *et al*., 2007a)**. Moreover, **Jovanovic *et al*. (1997)** reported that loss of substantia nigra neurons resulted in reduced synthesis and release of DA from nerve terminals. It has been reported that, either using single midbrain slice culture or triple culture, LPS induces dopaminergic neuronal loss which was accompanied by increased microglia activation and nitric oxide production **(Xing *et al*., 2010).** Increasing evidence has suggested that oxidative stress **(Elkon *et al*., 2004)** and neuro-inflammation **(Herrera *et al*., 2005)** are involved in the process of dopaminergic neuronal loss. Inflammation and oxidative stress-mediated by microglia has been known to be a significant pathological feature of Parkinson disease **(Jenner and Olnaw, 1998).** Microglia activation has been suggested to play an important role in initiating and/or amplifying neuronal injury since not only the substantia nigra has an extreme high density of resting microglia but also reactive microglia are found in close proximity to the damaged nigral neurons in the brain of Parkinson disease patients **(Le *et al*., 2001).**

A variety of deleterious pro-inflammatory factors and cytokines released from activated microglia trigger the dopaminergic neurodegeneration **(Le *et al*., 2001)** and in turn the dying neurons can release microglia-activating molecules **(Zhang *et al*., 2011)** forming a vicious degenerative cycle. **Lin *et al*. (2007b)** indicated that, the microglia cell mediated the neurotoxin 6-hydroxy dopamine (6-OHDA)-induced toxicity in human dopaminergic neuroblastoma cells. In addition, **Mazzio *et al*. (2003)** indicated that LPS injection leads to accumulation of DA metabolites which contribute to degeneration of dopaminergic neurons.

Recently, **Fan *et al*. (2011)** found that although the neonatal LPS-induced neurobehavioral impairment was spontaneously recoverable, the LPS exposure induced persistent injury to the dopaminergic system and chronic inflammation may represent the existence of silent neurotoxicity. The authors further suggested that the compromised mitochondrial function might contribute partially, to silent neurotoxicity, which was first proposed by **Reuhl (1991)** as persistent morphological and/or biochemical injury which remains unapparent unless unmasked by experimental or natural processes. It is likely that rat exposure to LPS at different stages of dopaminergic development may contribute to the different pattern in dopaminergic system injury seen in **Fan *et al*. (2011)** as compared to that reported by **Ling *et al*. (2006)** who observed a progressive dopamine neuron loss following supra-nigral LPS infusion in prenatal rats.

Gaykema and Goehler (2009) suggested that the sickness behavior that ensues as a result of ET injection and inflammation is characterized by diminished arousal and motivation and reduced appetite may emerge as a result of diminished activity of the hypothalamic orexin system which could be a prime candidate for the neurotoxicity driven by peripheral innate immune activation. Moreover, **Almeida *et al*. (2006)** supported that LPS-induced cold-seeking response is mediated by neuronal bodies located in the dorso-medial hypothalamus and neural fibers passing through the paraventricular nucleus in the hypothalamus, which may explain ET-shock due to LPS exposure.

On the other hand, the sharp decreases in 5-HT level in thalamus-hypothalamus and cerebellum after ET injection in the present study are in agreement with the results of **Cho *et al*. (2000)** who supported that LPS activates the TNF-α which exerts pronounced effects on 5-HT metabolism in most brain regions. Furthermore, LPS produced an increase in the extracellular concentrations of 5-HT and 5-hydroxyindoleacetic acid (5-HIAA) in the hippocampus, which was paralleled by a significant

decline in behavioral activity and a marked increase in extracellular corticosterone levels **(Linthorst *et al*., 1995).**

Moreover, i.p injection of LPS increased mouse brain concentrations of the 5-HT catabolite, 5-HIAA at all the examined brain regions **(Dunn**, **1992).** Also, the authors indicated that stressful treatments with ET have been shown previously to elevate brain concentrations of tryptophan, and concluded that activation of the sympathetic nervous system is responsible for the stress-related increase in brain tryptophan, probably by enabling increased brain tryptophan uptake. The increase in brain tryptophan appears to be necessary to sustain the increased 5-HT catabolism to 5-HIAA**.** Recently, **Del Angel-Meza *et al*. (2011)** showed that tryptophan which plays an important role in immune system, protein synthesis and melatonin production is a potent endogenous free radical scavenger antioxidant, has a protective effect in the oxidative damage in the model of endotoxic shock in the breeding nursling-induced by systemic administration of LPS (20mg/kg) acting as a scavenger of free radicals. The authors proposed that tryptophan is an innocuous protector agent in the endotoxic shock process.

The present results indicated that Prop & ET-treated rats showed a significant decrease in monoamines level as compared to control group, while showed a significant increase in NE, DA and 5-HT content if compared to ET-treated rats. The present results are in agreement with the results documented by **Noelker *et al*. (2005); Shimazawa *et al*. (2005); Ma *et al*. (2006); Cengiz *et al*. (2007) and Vauzour *et al*. (2007)**.

Propolis is one of the few natural remedies that maintained its popularity over a long period of time. The composition of prop is highly variable depending on the local plant and is reported to contain approximately 50% resin and vegetable balsam, 30% wax, 10% essential and aromatic oils, 5% pollen and 5% other substances (minerals) **(Cohen *et al.*, 2004)**. Furthermore, prop contains a mixture of biologically active chemicals including terpenes, cinnamic acid, caffeic acid and their esters, amino acids and flavonoids **(Volpert & Elstner, 1993)**. Caffeic acid phenethyl ester (CAPE) was reported to have antitumor **(Huang *et al*., 1996)** anti-inflammatory **(Michaluort *et al*., 1999)** and antioxidant properties **(Ahn *et al*., 2004).** Pinocembrin is the most abundant flavonoids in prop, and has been proven to have antioxidant, antibacterial and anti-inflammatory property **(Gao *et al*., 2008)**.

The antioxidant function of prop may be an underlying mechanism by which prop protects against neuronal damage. **Shimazawa *et al*. (2005)** indicated that prop significantly inhibited neurotoxicity and protected mouse forebrain against oxidative stress (lipid peroxidation). The authors postulated that the scavenging free radicals and inhibition of oxidative stress may be partly responsible for prop neuroprotective function against *in vitro* cell death and *in vivo* focal cerebral ischemia. Also, the antioxidant function of prop may be an underlying mechanism by which prop protects against neuronal damage. Moreover, **Noelker *et al*. (2005)** reported that prop derivatives, in particular CAPE may have a neuroprotective effect on neuronal cells and may also be a promising drug candidate to be taken into the *in vivo* models of Parkinson disease.

Ma *et al*. (2006) reported that pretreatment with CAPE prevented 6-OHDA induced neurotoxicity. The authors suggested that CAPE blocks 6-OHDA induced neuronal death possibly by increasing both antioxidation and neuroprotection effects**.** Moreover**, Cengiz *et al*. (2007)** observed that CAPE prevented vacuolization, an indication of brain edema, and showed that pretreatment with a single i.p injection of CAPE reduced the structural changes in the brain. **Vauzour *et al*.(2007)** indicated that CAPE contains a catechol moiety which inhibited tyrosinase-induced oxidation thus yielding cysteinyl polyphenol adducts, a mechanism by which polyphenols exert protection against neuronal injury relevant to neurodegenerative diseases. Furthermore, **Wang *et al*. (2009)** indicated that CAPE inhibited cytokine and chemokine-production by monocyte-denderitic cells which might be related to the nuclear factor signaling pathway during allergic disorders.

It could be concluded from this study that i.p injection of ET induced a dramatic change in monoaminergic system in the thalamus-hypothalamus and cerebellum of white male albino rats. It has been proven that the treatment of prop has antibacterial and anti-inflammatory properties which could abolish the disturbance in nervous system induced by ET treatment.

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Haemolymph amino acids alterations in pyridalyl treated desert locust, *Schistocerca gregaria* in relation to age

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Abstract: Studies were undertaken to investigate haemolymph amino acids alterations by amino acid analyzer in the 5th nymphal instar and adult *Schistocerca gregaria* in preoviposition and oviposition periods before and after pyridalyl treatment. The concentrations of these amino acids in both control and treated haemolymph samples of the 5th nymphal instars showed a wide range of variations. The pattern of amino acids showed an obvious increase in the haemolymph of the nymph after treatment with pyridalyl. Methionine and tryptophan were completely lost in untreated and treated nymphs. The pattern of some amino acids in 1-day old adult exhibited obvious increase in the haemolymph after treatment with pyridalyl, while proline, threonine, glycine and arginine showed a decrease in their concentrations after treatment. On the other hand, most of the amino acids exhibited an obvious decrease in the haemolymph of the 10 days old adult females after treatment with pyridalyl. Also, the amino acids in the haemolymph of the 18 days old adult females exhibited an obvious decrease after treatment with pyridalyl except threonine, serine, phenylalanine, glutamic acid and alanine.

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1. Introduction

The haemolymph, in most insects, is a greenish yellowish fluid containing a large number of cells or haemocytes and various organic and inorganic constituents. The insect haemolymph serves as a bathing medium for various tissues and organs as they lack an epithelial lining of a true coelom. Therefore, the haemolymph forms the meeting place of both the raw materials required and the products of various physiological activities of the insect body. Since the haemolymph is not directly connected with the external environment any change in it can be taken as a measure of the physiological state of the internal environment of the intact animal. Analysis of the haemolymph, therefore, may provide one of the most reliable data which can be used as an index of the physiological activity (Buck, 1953; Wyatt, 1961). The insect haemolymph is noted for its high titer of free amino acids (Chen, 1962). The most important functions of amino acids, the building blocks of the proteins that are derived from the insect diet, include the synthesis of structural proteins of the integument and the synthesis of hormones and enzymes that participate in the synthesis nucleic acids (Klowden, 2007). Amino acids are also required by insects for transport and storage, and as receptor molecules. In addition, some amino acids are involved in morphogenesis (Chapman, 2002). The pattern of haemolymph free amino acids can be modified by development, oogenesis, feeding, cuticular tanning, silk production, or flight activity (Blum, 1985). Therefore, the present work aims to study the haemolymph amino acids alterations in the 5th nymphal instar and adult of *Schistocerca gregaria* in preoviposition and oviposition periods before and after pyridalyl treatments.

2. Material and Methods

Insects:

The colony of *Schistocerca gregaria (*S. *gregaria)* was maintained from Anti Locust Research Center Dokki –Giza, Egypt. The insects were maintained in the laboratory under crowded conditions at 32±2ºC and 65-80% RH and reared according to Hunter-Jones (1961) and Hassanein (1965).

Administration of the insecticide:

Groups of 50 hoppers of 1- day old 4th nymphal instars were treated with 500 p.p.m. of pyridalyl® which is a novel insecticide that has a phenoxy-pyridaloxy derivative structure (S-1812; 2, 6-dichloro-4-(3, 3-dichloroallyloxy) phenyl 3- (5-(trifluoromethyl)-2-pyridyloxyl propyl ether). The concentration was chosen depending on some preliminary trials carried out on the present insect species. Feeding technique was applied using fresh clean lettuce (*Lactuca sativa)* after dipping for 3 minutes. Feeding on treated food plant was allowed for 24 hrs. Controls were fed for 24 hrs on lettuce

leaves dipped in tap water for 3 minutes and dried in open air. After feeding for 24 hrs, the treated nymphs were daily fed on untreated fresh lettuce and kept under the same laboratory conditions.

Sample preparation for the assay of total amino acids in the haemolymph:

Haemolymph from the 5-days old 5th nymphal instars, 1-day old adult females, 10-days old adult females and 18- days old adult females was drawn by a fine capillaries through a puncture in the neck membrane, pooled into Eppendorff tubes, stored in ice, containing few milligrams of phenylthiourea to prevent tanning or darkening and then diluted five times with saline solution 0.7%. The haemolymph samples were then centrifuged at 2000 r.p.m. for 5 min, and only the supernatant fractions were used for assay directly or frozen until used.

Analysis of amino acids in the haemolymph with amino acid analyzer:

The haemolymph from the 5-days old 5th nymphal instars, 1-day old adult females, 10-days old adult females and 18-days old adult females of *S. gregaria* treated and untreated were collected and kept at -20˚C. Amino acid analysis was carried out by amino acid analyzer. The samples were hydrolyzed in sealed, evacuated ampoules in an oven at 110˚C for 16 hrs. The extraction and analysis were performed in Cairo University Research Park (CURP) at Amino Acids Lab. according to the method described by Rashad and Abdel Zaher (2008).

3. Results

1. Total amino acids in the haemolymph of the 5th nymphal instar:

The total amino acid profile of haemolymph of *S. gregaria* nymph was analyzed using the Amino Acid Analyzer and the results are presented in figure (1). The analysis detected the amino acids in control and treated nymphs. Comparison of the concentrations of these amino acids in both control and treated haemolymph samples showed a wide range of variations. It appears that the pattern of amino acids showed an obvious increase in the haemolymph of the nymph after treatment with pyridalyl. The relative abundance of total amino acids in the haemolymph of the control nymph was as follows: glycine > glutamic acid > aspartic acid > leucine > alanine > valine > lysine > serine > tyrosine > histidine > threonine > arginine > isoleucine > phenylalanine. The concentration of proline was much lower.

The relative abundance of total amino acid profile in pyridalyl treated nymph was as follows: glutamic acid > glycine > aspartic acid > leucine > valine > alanine > tyrosine > lysine > histidine > isoleucine > arginine > phenylalanine > threonine > serine. Proline showed no obvious quantitative changes in the haemolymph of the nymph after treatment with pyridalyl. Methionine and tryptophan were completely lost in untreated and treated nymphs. The difference between untreated and treated nymphs showed a significant increase in individual free amino acids except proline.

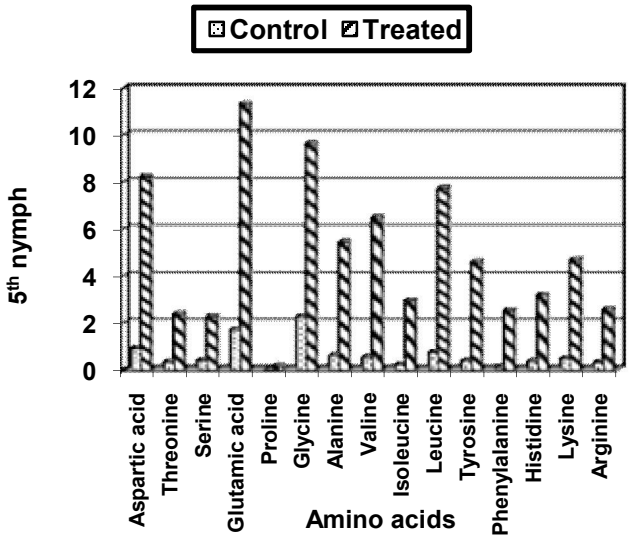

Figure (1): Effect of pyridalyl on the haemolymph amino acid (g/100ml) in the control and treated nymphs of *S. gregaria*.

Total amino acids in the haemolymph of the adult *S. gregaria* in relation to age:

2.1. Total amino acids of 1day old adult:

The data presented in figure (2) shows that the 15 amino acids were also detected in control and treated 1day old adult of *S. gregaria.* It appears that the pattern of some amino acids exhibited an obvious decrease in the haemolymph of the adult after treatment with pyridalyl; these amino acids were proline, glycine and arginine. On the other hand, some amino acids showed an obvious increase in the haemolymph of the adult after treatment with pyridalyl, e.g. aspartic acid, leucine, alanine, valine, lysine, histidine, phenylalanine, tyrosine, isoleucine, serine, and glutamic acid. Threonine showed no obvious quantitative changes in the haemolymph of the adult after treatment with pyridalyl.

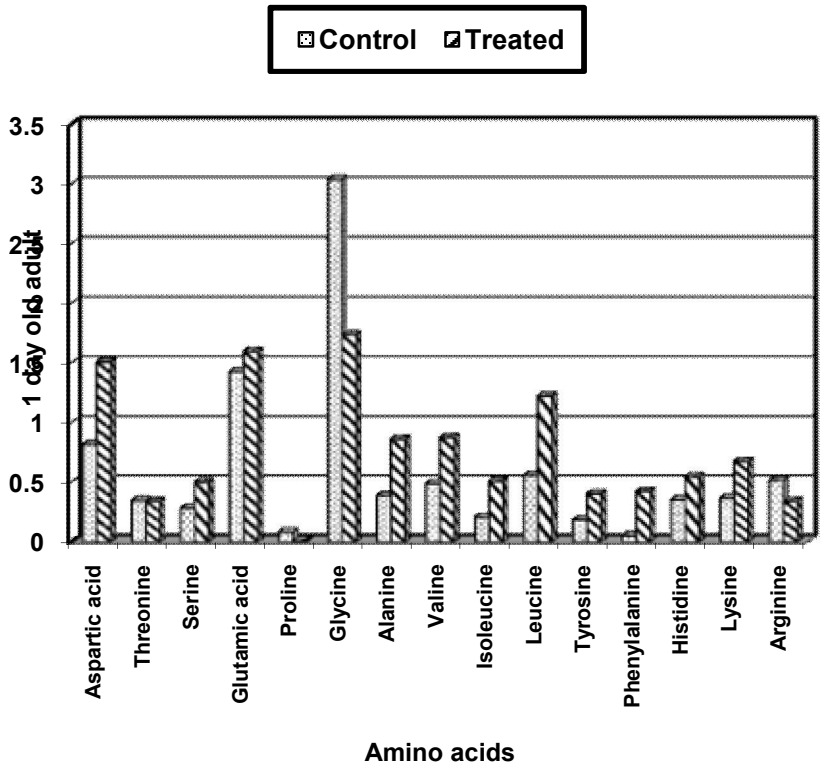

Figure (2):Effect of pyridalyl on the haemolymph amino acid (g/100ml) in the control and treated 1day old adult of *S. gregaria.*

2.2. Total amino acids of 10 days old adult:

The data presented in figure (3) shows that most of the amino acids exhibited an obvious decrease in the haemolymph of the 10 days old adult females after treatment with pyridalyl; these amino acids were glycine, glutamic acid, aspartic acid, leucine, valine, histidine, lysine, tyrosine, isoleucine, serine and threonine. Alanine, phenylalanine and arginine showed no obvious quantitative changes in the haemolymph of the adult after treatment with pyridalyl. Proline exhibited some increasing in treated 10 days old adult females.

2.3. Total amino acids of 18 days old adult:

Data presented in figure (4) shows that all the amino acids exhibited an obvious decrease in the haemolymph of the 18 days old adult females after treatment with pyridalyl except threonine, serine, phenylalanine, glutamic acid and alanine. Threonine, serine and phenylalanine showed an obvious increase after treatment while glutamic acid and alanine were completely lost.

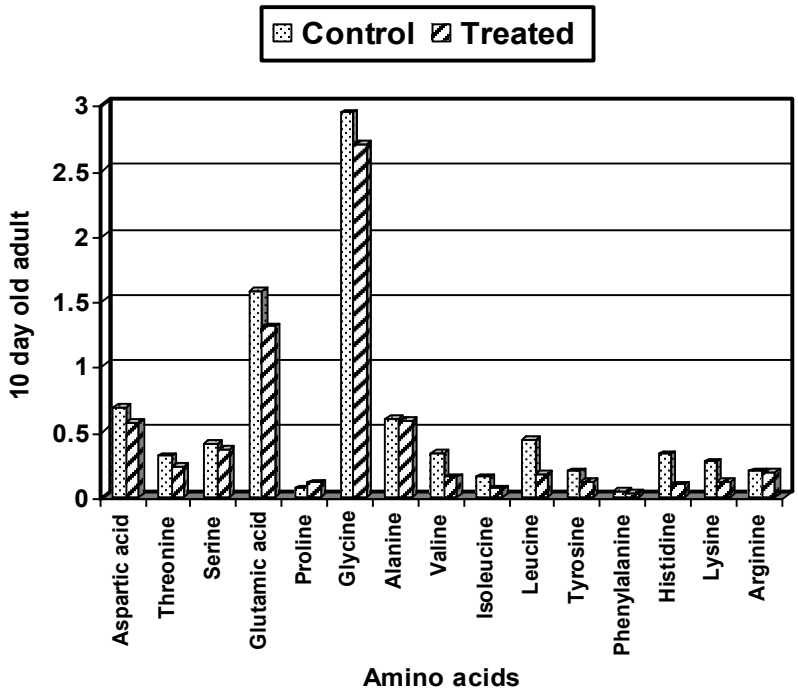

Figure (3): Effect of pyridalyl on the haemolymph amino acid (g/100ml) in the control and treated 10 days old adult of *Schistocerca gregaria.*

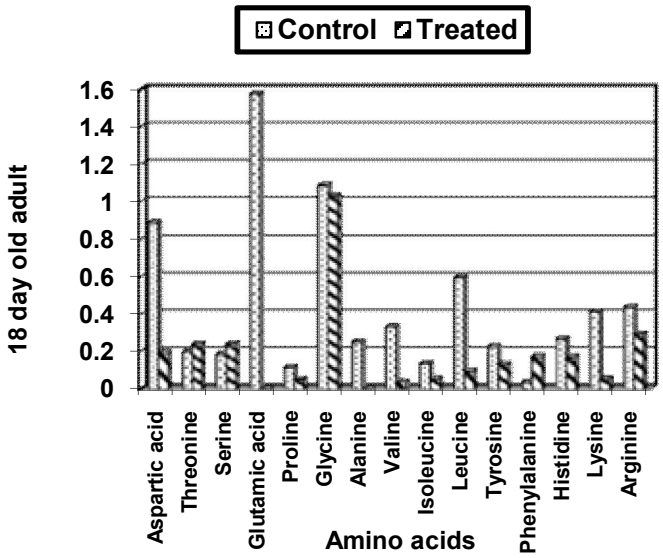

Figure (4):Effect of pyridalyl on the haemolymph amino acid (g/100ml) in the control and treated 18 days old adult of *S. gregaria.*

Comparison between the pattern of haemolymph amino acids in the chosen experimental stages showed that the concentration of glycine was the highest value in the normal 1-day old adult (3.0399 g/100ml) followed by a decrease in 10-days old adult (2.937 g/100ml) then 5th nymphal instar and 18-days old adult as shown in table (1). Glutamic acid showed no obvious change between the chosen stages except it's highly increase in the 5th nymphal instar (11.339 g/100ml) and it's lost in 18-days old adult after treatment with pyridalyl. Aspartic acid showed the lowest value in the normal 1-day old

adult (0.815 g/100ml) than the 5th nymphal instar (0.931 g/100ml). Its value was decreased in normal 10-days old adult (0.682 g/100ml) then was increased in18-days old adult (0.889 g/100ml). After treatment with pyridalyl, aspartic acid was increased in both 5th nymphal instar (8.260 g/100ml) and 1-day old adult (1.508 g/100ml) and decreased in 10-days old adult (0.563 g/100ml) followed by in18-days old adult (0.196 g/100ml). The other amino acids were fluctuated as shown in table (1) between increasing and decreasing after treatment with pyridalyl.

Table (1): Total amino acid profile of haemolymph in pyridalyl control and treated 5th nymphal instar, 1-day old adult, 10-days old adult and 18-days old adult of *Schistocerca gregaria*.

No.	Amino acids	5th nymph control	5th nymph treated	1day old adult control	1day old adult treated	10days old Adult control	10days old adult treated	18 days old adult control	18days old adult treated
1	Aspartic acid	0.931	8.260	0.815	1.508	0.682	0.563	0.889	0.196
2	Threonine	0.362	2.401	0.346	0.339	0.314	0.232	0.199	0.241
3	Serine	0.423	2.291	0.282	0.498	0.403	0.358	0.186	0.243
4	Glutamic acid	1.728	11.339	1.427	1.595	1.577	1.303	1.577	-
5	Proline	0.038	0.177	0.082	0.01	0.064	0.108	0.117	0.053
6	Glycine	2.270	9.652	3.039	1.737	2.937	2.697	1.089	1.033
7	Alanine	0.630	5.454	0.389	0.860	0.601	0.584	0.253	-
8	Valine	0.543	6.510	0.488	0.876	0.338	0.150	0.335	0.039
9	Isoleucine	0.255	2.980	0.206	0.508	0.151	0.065	0.138	0.055
10	Leucine	0.752	7.756	0.558	1.223	0.439	0.176	0.596	0.098
11	Tyrosine	0.390	4.609	0.185	0.403	0.197	0.117	0.229	0.136
12	Phenylalanine	0.116	2.552	0.052	0.423	0.040	0.032	0.037	0.175
13	Histidine	0.377	3.196	0.354	0.545	0.325	0.091	0.268	0.173
14	Lysine	0.504	4.704	0.366	0.676	0.267	0.120	0.415	0.058
15	Arginine	0.327	2.592	0.514	0.341	0.193	0.190	0.439	0.298

4. Discussion

Analysis of haemolymph of 5th nymphal instar, 1day old adult, 10 days old adult and 18 days old adult of *S. gregaria* revealed the presence of 15 amino acids, the concentration of which in normal and treated samples showed a wide range of variation. All amino acids showed an obvious increase in the haemolymph of the 5th nymphal instar after treatment with pyridalyl. The disappearance of methionine as an essential amino acid may be due to its consumption in the methylating intermediary pathways (Boctor, 1978). The fact that arginine increased after treatment was related to its proposed function in the metabolic process in the healthy nymph or to its accumulation as guanidine derivative (Pant & Agrawal, 1964). In the present study, increasing the amino acids in the treated 5th nymphal instar of

S. gregaria may be due to the increase representing the compensation for the loss of chlorides and other inorganic ions which fall during starvation when osmotic pressure falls (Wigglesworth, 1972) as well as it might be interpreted as being due to the inhibition of protein formation (Bakr *et al.*, 1991). They added that the variations in quantity of the free amino acids content may interfere in the transcript of DNA during the process of protein synthesis which may be the reason of the observed abnormalities.

The high levels of amino acids in treated insects may cause a great disturbance in biochemical activities as protein metabolism as well as in the regulation of osmotic pressure (Enan, 2004). Blum (1985) reported that the use of amino acids for osmoregulation may at times be passive process in which all amino acids increase or decrease proportionally, but the change in specific amino acid titers in some insects indicates active regulated processes.

The remarkable increase of glycine, glutamic acids and aspartic acid in the chosen stages indicated that these are the predominant amino acids of *S. gregaria.* Blum (1985) stated that glutamate, proline and glycine are the predominant amino acids in most insect haemolymph. In the present study, proline was present in low concentration, this may be due to it does not used as a source of energy. Chapman (2002) explained that locusts depend mainly on fat as a fuels providing energy for flight but use carbohydrates during short flight and the early stages of sustained flight. Fat is more suitable than carbohydrates as a reserve for insects that make long flight because it

produces twice as much energy per unit weight. The lower concentration of proline and highest concentration of glutamic acid and alanine may be due to the conversion of proline to glutamate as mentioned by Klowden (2007). He stated that the proline is converted to glutamate by the enzyme proline dehydrogenase, which is activated by high level of pyruvate, the transamination of glutamate with pyruvate produce the alanine. Ray (1964) stated that the loss of free proline was balanced by an increase in free alanine and glutamine.

On the other hand, the massive production of certain kinds of proteins alters the haemolymph amino acids pattern (Blum, 1985). In species like locusts and cockroaches, with a discontinuous oviposition rate, there is a cyclic rise and fall of haemolymph vitellogenins concentration corresponding to the extent of ovarial maturation of eggs (Blum, 1985). These statements of Blum explain the increasing of glycine in 1-day old adult followed by decreasing in10-days old adult then increased again at 18-days old adult. The 1-day old adult represents the beginning of the first cycle followed by the end at 10-days old adult. The beginning of the second cycle was represented in 18-days old adult.

Collett (1976) recorded that glycine was active in the synthesis of several proteins. Although the results from this study did not conclusively show that pyridalyl interferes with cell function, it would be worthwhile to investigate its effect on cell function in a future study.

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