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Phacoemulsification as a Primary Treatment Modality for Chronic Angle Closure Glaucoma

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Abstract: Purpose: to study the efficacy and safety of phacoemulsification with intraocular lens implantation for controlled angle closure glaucoma. **Design:** prospective non randomized comparative study. **Methods:** 50 eyes of 36 patients were included in the study.25 eyes were treated by primary phacoemulsification with IOL implantation (IOL group) and 25 eyes were treated by laser iridotomy (LI group). IOP, number of antiglucoma medications, corneal endothelial cell counts were assessed in each group. **Results:** in IOL group, IOP was significantly reduced from preoperative mean of 16.014±0.27mmHg to a 6 months postoperative mean of 11.68±0.12mmHg (P=0.001). However in LI group, the mean preoperative IOP was 15.99±0.003mmHg and the 6 months postoperative IOP was 15.95±0.20 (P=0.264). In IOL group, no cases used antiglucoma medications 6 months postoperatively while in LI group the mean number of antiglucoma medications was 0.23±0.04 (P=0.0001). There were no significant differences in preoperative and postoperative corneal endothelial cell counts between IOL &LI groups (P=0.63). **Conclusion:** phacoemulsification with intraocular lens implantation for controlled CACG is a safe and effective method in reducing IOP, so the procedure could be the treatment of choice for controlled CACG with cataract.
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Keywords: phacoemulsification- chronic angle closure glaucoma (CACG) - cataract- laser

1. Introduction:

Chronic angle closure glaucoma (CACG) is a leading cause of blindness and is potentially preventable

The lens plays an essential and pivotal role in the pathogenesis of primary and secondary angle closure glaucoma [1,2]

Clinical studies suggest that lensectomy and posterior chamber intraocular lens (IOL) implantation for Controlled chronic angle closure glaucoma (CACG) or primary angle closure (PAC) patients may offer successful IOP control, and maintenance of improved vision

Lensectomy eliminates pupillary block, widens the angle to lessen angle crowding, thus reducing the iridotrabecular proximity, and is is the only treatment alternative that reduces if not corrects the responsible anatomic predisposition to angle closure [6]

Medical management and laser irodotomy (LI) remain the most common modes of treatment of an acute attack and controlled chronic angle cloture glaucoma.[1]

Newer approaches including early lens removal are gaining popularity because of their potential long term success in intraocular pressure (IOP) control.[1-4]

For eyes with CACG and cataract, treatment involves either LI followed by cataract surgery or primary phacoemulsification and IOL implantation.

Many studies described that phacoemulsification with PC-IOL implantation decreased IOP in eyes with angle closure glaucoma. [1-5]

Aim of the work

To study the efficacy and safety of phacoemulsification plus IOL implantation for controlled CACG.

2. Patients and Methods

Prospective study of 50 eyes of 36 patients were treated for CACG between Sept. 2009 and April 2011

Patients with cataract, no history of previous ocular surgeries, and whose IOP was controlled with or without anti-glaucoma medications were included in the study.

The eyes with uncontrolled CACG were excluded from the study due to the possibility of additional glaucoma surgery that may be needed.

All patients underwent comprehensive examination which included:

Stit lamp examination that showed peripheral anterior chamber as narrow as one third of the corneal thickness or less, using the van Herick method.

Goniscopic examination that revealed Shaffer lor2 and peripheral anterior synchia without iritis and inflammatory nodules.

Fundus examinations reveal glaucomatous optic disc excavation.

Visual field examination showed field defect that led to diagnosis of CACG.

Following informed consent, 25 eyes were treated by primary phacoemulsification plus IOL implantation (IOL group) and 25 eyes were treated by laser iridotomy as a method to relieve pupillary block (LI group).

Operative procedures were as follows: under periocular anesthesia, 2.8cm corneal incision was made after Continuous curvilinear Capsulorhexis using a 25- gauge bent needle, standard phacoemulsification was performed .

A foldable hydrophilic acrylic posterior chamber IOL with 6.0 mm optic was implanted through 3.2 mm corneal tunnel.

Mean while, LI using combined argon and Nd YAG laser surgery was performed as follows: several shots of green laser light (power 0.15-0.2w, spot size 300μm, and duration 0.2s). 50-100 shots with power of 0.85-1w, 50 μm spot size, and 0.02-0.2s duration were done.

Next, several pulses of Nd: YAG laser with power of (1.3-2.3mj) were repeated until a patent irodotomy was formed.

IOP and number of antiglaucoma medications were assessed in each group preoperatively and 1,3,6 months postoperatively. IOP was measured using a Goldman applanation tonometer. Preoperative and postoperative corneal endothelial cell counts were compared between each group.

3. Results

Preoperative patients' demographics including age, sex did not significantly differ between the two groups (Table 1).

Table 1. Mean IOPs before treatments and 1,3,6 months after treatment are shown in table 2.

	IOL group	LI group
Sex (men/women)	3/17	4/12
Mean age ± SD (years)	71.3±2.8	70.2±5.2
Range (years)	(58-83)	(53-82)

Figure (1) there was no significant differences in mean preoperative IOPs between the 2 groups. Following treatment, mean IOPs in the IOL group were significantly reduced from a preoperative mean of 16.014±0.27 mmHg to a 6 month postoperative mean of 11.68±0.12 mmHg (p=0.001).

In LI group, no significant difference in IOP was found between pre-and postoperative time (15.99±0.03 mmHg preoperatively and 15.95±0.20 mmHg at 6 month postoperatively) (P=0.264).

There was significant difference between 6 month postoperative IOP between the two groups (P= 0.0001).

Table (2) shows mean number of antiglaucoma medications before and after treatment.

There was not significant difference in preoperative mean numbers between the 2 groups.

No cases used anti- glaucoma medications 6 months postoperatively in IOL group whereas in the

LI group, mean number of anti-glaucoma medications decreased to 0.23± 0.04 (p=0.0001).

Both groups showed a 6 months postoperatively significantly reduced numbers of medications.

There were no significant differences in preoperative& postoperative corneal endothelial cell counts between IOL & LI group (P= 0.63) (Table 2).

Table (2) comparison between laser (n=25) &IOL (n=25) groups*

	Group	Mean	Std. Deviation	t	p-value
Number of Antiglaucoma medications (preoperative)	IOL	.6514	.0124	0.726	.471 Not significant
	laser	.6540	.0129		
Number of Antiglaucoma medications (1month postoperative)	IOL	.0832	.0497	22.918	.0001 Significant
	laser	.3260	.0182		
Number of Antiglaucoma medications (3month postoperative)	IOL	.0852	.0564	14.654	.000 Significant
	laser	.2813	.0359		
Number of Antiglaucoma medications (6month postoperative)	IOL	.00026	.0003	28.898	.0001 Significant
	laser	.23080	.0398		
IOP (preoperative)	IOL	16.0148	.27356	.342	.734 Not significant
	laser	15.9960	.03000		
IOP (1month postoperative)	IOL	12.4424	.03689	397.488	.0001 Significant
	laser	16.0136	.02564		
IOP(3month postoperative)	IOL	12.1160	.09014	138.469	.0001 Significant
	laser	15.9876	.10686		
IOP(6month postoperative)	IOL	11.6840	.12453	88.010	.0001 Significant
	laser	15.9480	.20779		
Corneal endothelial cell count (preoperative)	IOL	2646.80	37.58	.557	.580 Not significant
	laser	2641.24	32.77		
Corneal endothelial cell count (postoperative)	IOL	2623.64	39.76	0.482	.632 Not significant
	laser	2628.60	32.568		

Comparison included mean IOP in mmHg, mean number of antiglaucoma medications and mean corneal endothelial cell count.
* By using independent samples t test
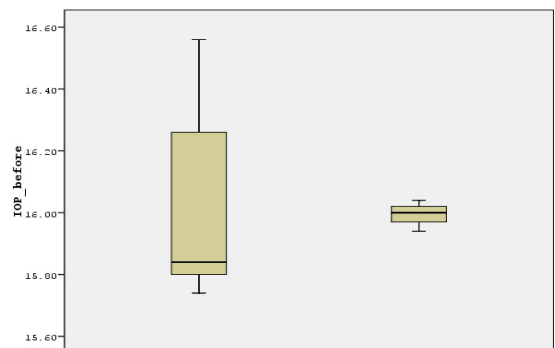
Figure (1) Showing comparison between IOL and laser groups regarding IOP (preoperative)
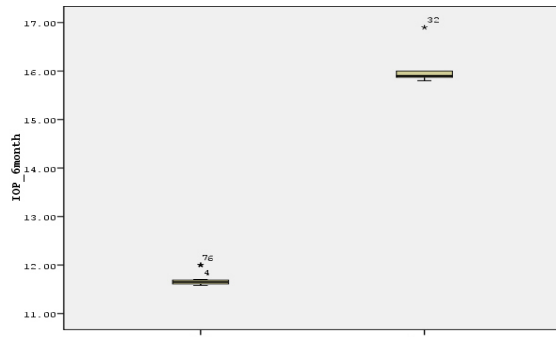
Figure (2) Showing comparison between IOL and laser groups regarding IOP (6 months postoperative)
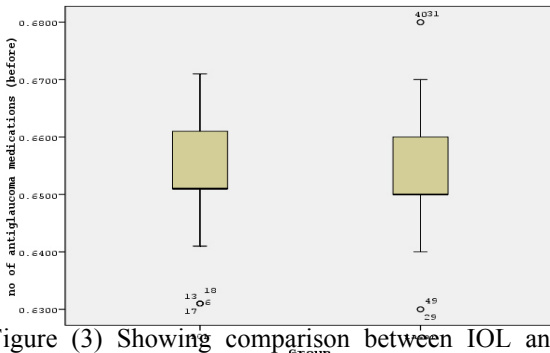
Figure (3) Showing comparison between IOL and laser groups regarding number of antiglaucoma medications (preoperative)
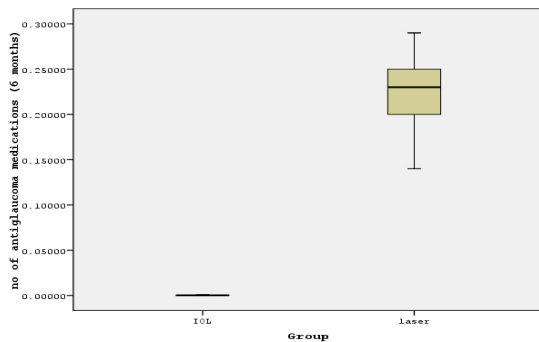
Figure (4) Showing comparison between IOL and laser groups regarding number of antiglaucoma medications (6 months postoperative)
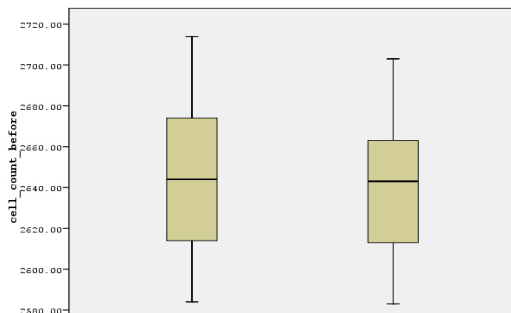
Figure (5) Showing comparison between IOL and laser groups regarding corneal endothelial cell count (preoperative)
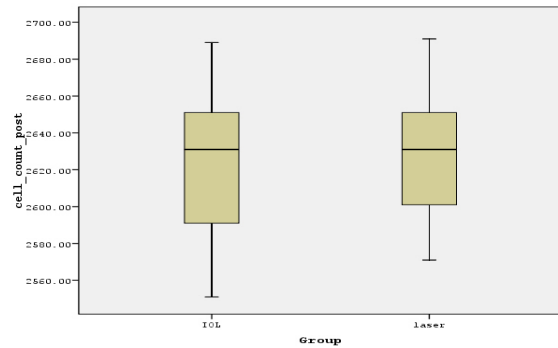
Figure (6) Showing comparison between IOL and laser groups regarding corneal endothelial cell count (postoperative)

4. Discussion

Angle closure glaucoma is an ocular anatomical disorder characterized by closure of drainage angle by oppositional or synchial approximation of iris against the trabecular meshwork, blocking its access to aqueous humor.

Pupillary block is the most frequent and important mechanism responsible for angle closure but in many cases it is not the only mechanism involved [6,9-11]

These pathologic mechanisms exist because of primary anatomic variations in size, position and relationship of the anterior segment structures. Treatment of primary angle closure glaucoma and cataract involves the relief of pupillary block using either laser iridotomy or phacoemulsification with IOL implantation.

Also glaucoma surgery alone or combined glaucoma with cataract surgery may be beneficial.

Many studies described that cataract surgery with IOL implantations deceased IOP in eyes with angle closure glaucoma[1-5,7,8,12-14], only fewer studies on phaco & IOL implantations for CACG before relief of pupillary block. [3,12-14]

We found that primary phacoemulsification with IOL implantation significantly deceased IOP at 6 months postoperatively (Figure 2, Table 2),

indicating that IOL implantation not only relieved pupillary block but also reduced IOP. While LI did not reduce IOP within 6 months.

The explanation of such effect is that IOL implantation make anterior chamber wide and deep which may lead to decease of IOP as described by Hayashik *et al.*,[6]

Also IOL implantation can relieve pupillary block completely while LI may not relieve it completely. [9-11]

Both groups in our study showed significantly reduced number of anti-glaucoma medications (Table2).

So both IOL implantation and laser iridotomy improved CACG. Moreover, 3and 6 months postoperatively, no cases used anti-glaucoma medications in phaco & IOL group.

This indicates that IOL implantations are more effective in decreasing the number of anti- glaucoma medications than LI.

To evaluate the safety of phaco & IOL implantations, we compared pre operative & postoperative corneal endothelial counts between the two groups (Table 2).

There was no significant difference between the phaco & IOL group and LI group indicating that phaco and IOL implantations were as safe as LI.

Conclusions

Phacoemulsification with intraocular lens implantation for control of CACG is a safe and effective method in decreasing IOP.

So this procedure could be the treatment of choice for controlled CACG with cataract.

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Light Chain Antigenic Determinants (κ and γ) Influence on the Treatment Outcome of Chronic Hepatitis C Infection in Egypt

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Abstract: Background: HCV is an endemic problem in Egypt with genotype 4 affecting about 90% of the infected patients. The treatment with interferon and ribavirin is costly and has various side effects, so there is an urgent need for predictors of interferon response. Of the proved to predict the response is IL-28B genotype, but there are need for other predictors. **Aim of the study:** To detect GM 3/17, GM 23 +/– and KM 1/3 ; which are γ and κ immunoglobulin light chain antigenic determinants; in the patients with hepatitis C virus and to assess their influence on the outcome of chronic hepatitis C treatment. **Results:** There was a significant association between the KM 1/3 allotypes and the treatment outcome. KM homozygousity is associated with six fold increase in response to treatment. **Conclusion:** KM 1/3 genotypes can be used a marker for prediction of chronic HCV treatment outcome.

Keywords: KM, GM, κ and γ light chain antigenic determinants, Ig allotypes, HCV, interferon predictors.

1. Introduction:

Hepatitis C virus (HCV) is a common infection and a major cause of chronic hepatitis. Worldwide >170 million people are affected. Of persons acutely infected with HCV, about 20% spontaneously clear the virus. Both viral and host genetic factors play important roles in the clearance of HCV *(Singh et al., 2007).* GM and KM allotypes are associated with the susceptibility to and outcome of infection by several infectious agents. GM allotypes are strongly associated with IgG subclass concentrations, making them relevant to viral immunity, as the antibody responses to most viral epitopes appear to be IgG subclass (IgG1 and IgG3) restricted *(Pandey et al., 2004).*

KM3 could be a marker for enhanced HCV-specific CD8+T-cell activity through significant linkage disequilibrium with a *cis-*acting enhancer element in the CD8 gene complex. Increased HCV-specific CD8+ T cell responses are associated with SVR to peginterferon-ribavirin therapy for chronic HCV infection *(Tatsumi et al., 2010).*

Recent genome wide association studies (GWAS) have revealed that single nucleotide polymorphisms (SNPs) in the promoter region of IL28B (the gene encoding IFN λ3) are strongly associated with response to SOC (Standard of Care) therapy (although the negative predictive value of the current IL28B region SNPs alone is still only ~20-30%) *(Gelman and Glenn, 2011).* The SNP rs12979860 is strongly associated with SVR in patients infected with HCV-4, but not with liver disease severity. Analysis of IL28B genotype might be used to guide treatment for these patients *(Asselah et al., 2011).*

2. Subjects and Methods:

Forty one patients with chronic HCV were enrolled in this study after oral consent; they included two groups. Group I included 20 patients SVR received treatment with combination interferon α2a or α2b and ribavirin for one year. Group II included 21 patients; 17 were non responder for the same treatment after 12 weeks, other 4 relapsed after 6 months of end of treatment.

PCR for determination of the immunoglobulin GM23/23, KM 1/3 and GM 3/17 allotypic polymorphism. This was done in the Immunology Lab in the Clinical pathology department in Ain Shams University.

For the determination of IgG1 allelic markers GM3 and GM17 (arginine-to-lysine substitution, a G→A transition in the CH1 region of the γ1 gene). PCR purification and DNA sequencing for determination of GM 3/17 allotype polymorphism was done using Applied Biosystems technology. This was done using primers 5'-CCCCTGGCACCCTCCTCCAA-3' and 5'-GCCCTGGACTGGGGCTGCAT-3'.　　　　For

determination of GM23 (valine-to-methionine substitution, a G→A transition in the CH2 region of the γ2 gene). Nested-PCR–restriction fragment length polymorphism (PCR-RFLP) for Gm 23 (valine-to-methionine substitution, a G→A transition in the CH2 region of the γ2 gene). This was done as described by ***Brusco et al.(1995)***. The primers used were 5'-AAATGTTGTGTCGAGTGCCC-3' and 5'-GGCTTGCCGGCCGTGGCAC-3'. A 197-bp segment was further amplified from this 915-bp fragment, by use of primers 5'-GCACCACCTGTGGCAGGACC-3'and 5'-TTGAACTGCTCCTCCCGTGG-3'. Digestion of the amplified product by the restriction enzyme HSP 92 II resulted in the following products corresponding to the following 3 genotypes: GM23+, 90 bp, 63 bp, and 44 bp; GM23−, 134 bp and 63 bp; and GM23+,23−, 134 bp, 90 bp, 63 bp, and 44 bp. Restriction digestion (PCR-RFLP technique) for KM1 and KM3 was done using the method described by ***Moxley and Gibbs (1992).*** The primers used 5'-ACTGTGGCTGCACCATCTGTCT-3' and 5'-TCAGGCTGGAACTGAGGAGCAG-3'. Digestion of the amplified product (360 bp) by the restriction enzyme *Acc*I resulted in the following products corresponding to the following 3 genotypes: KM1, 360 bp; KM3, 247 bp and 113 bp; and KM1/3, 360 bp, 247 bp, and 113 bp

Statistical analysis:

Analysis of data was done by IBM-compatible computer using SPSS (statistical program for social science version 20) and R statistical package (Version 2.13.2), Spearman correlation and logistic regression tests were done for prediction of binary dependent variable.

3. Results:

Group I included 17 (85 %) males and 3(15 %) females, their age's ranges from 26-60 with mean of (47) years. Group II included 17(81%) males and 4(19%) females, their age's ranges from 23-66 with mean of (43) years.

Table (1) shows that there is a statistically significant difference between the two groups as regard to the KM genotypes. P_1 =0.04* .However there is no statistically significant difference between the two groups as regard to GM23 or GM3/17 in P_1. Also the table shows there is no statistically significant difference between the two groups as regard to the homozygousity and heterozygousity of different genotypes P_2, however the KM genotype homozygousity nearly reaches statistical significance with value P_2 =0.057. There is no statistically significant difference between the two groups as regard to the various KM and GM allotypic carriers and non carriers of different alleles P_3.

Table (2) shows that the homozygotes have 6.75 times (=exp (1.91)) the odds of being SVR as those who are heterozygotes. This was done by using the response as the dependent variable and the zygousity as the explanatory variable. Concluding that the zygousity is independent predictor for treatment response.

Table (3) shows assessment of predictive efficiency, cutoff 0.5, of the KM 1/3 zygousity on the treatment outcome, where the sensitivity of the test is 85.8% and the specificity of the test is 52.9% . Where is the sensitivity; is the percent correctly predicted to be SVR and the specificity is the percent correctly predicted to be with no response.
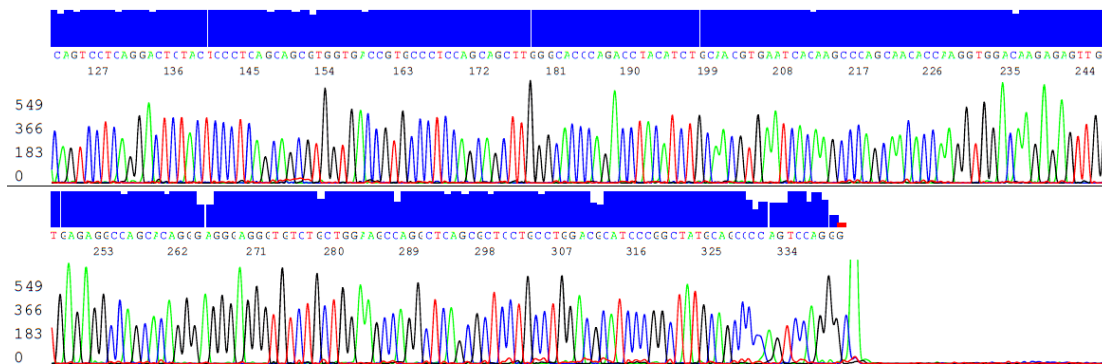
Figure (1):DNA sequencing results showing homozygous GM3 (a single G peak = a single black color peak is present at position 238).
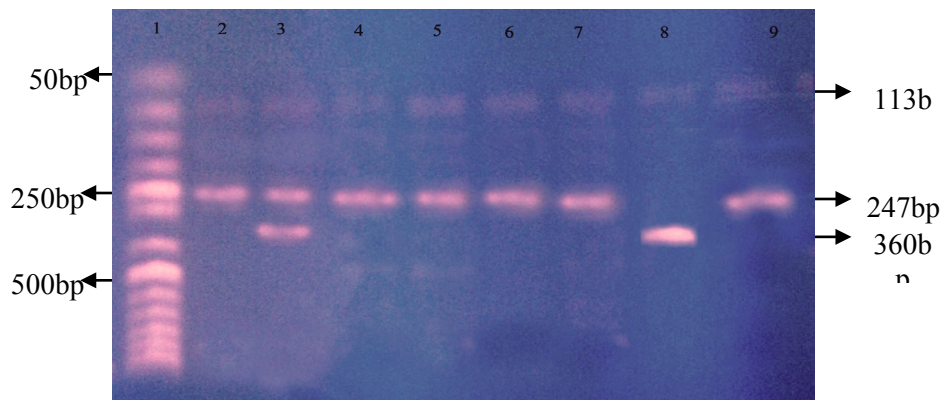
Figure (2): KM 1and KM 3 polymorphism analysis shown by agarose gel electrophoresis:
Lane (1) DNA ladder (50bp).   Lane (2) KM 3→ 2 bands (247bp and 113bp).
Lane (3) KM 1,3 → 3 bands (360bp, 247bp and 113bp).   Lane (8) PCR product mock (360bp).
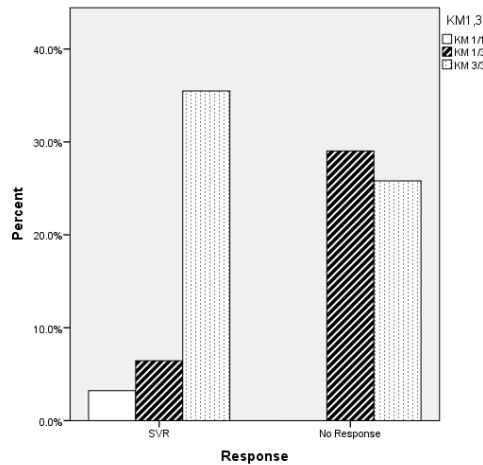
Figure(3): (no need) Comparison between the two groups as regards the KM genotypes (KM1,KM1/3, KM3). *p <0.05* (S).*

Table (1): Comparison between the two groups as regard the allotypic carriers and homozygousity:

Genotype	No response	SVR	Global significance P_1	Significance of homozygous P_2	Significance of first carrier P_3
KM 1/1	0 (0%)	1(7%)	<0.05* S	>0.05 NS	>0.05 NS
KM 1/3	9(53%)	2(14%)			
KM 3/3	8(47%)	11(79%)			
GM23 +/+	6(32%)	3(18%)	>0.05 NS	>0.05 NS	>0.05 NS
GM23 +/–	9(47%)	10(59%)			
GM23 –/–	4(21%)	4(23%)			
GM 3/3	8(42%)	10(50%)	>0.05 NS	>0.05 NS	>0.05 NS
GM 3/17	3(16%)	5(25%)			
GM 17/17	8(42%)	5(25%)			

Because of typing failures total do not sum to 21 in case of No Response or 20 in case of SVR.

Table (2): Logistic regression test to for prediction of KM 1/3 zygousity on the response

Variable	Regression coefficient	Significance
Zygousity of KM 1,3		
Heterozygous(0)	Reference (0)	
Homozygous (1)	1.91	<0.05* S
Constant	–1.504	>0.05 NS

Table (3): The outcome assessment of Logistic regression test to for prediction of KM 1/3 zygousity on the response

Response	Prediction percentage correct
No response	52.9%
SVR	85.8%

Table (4): Spearman rank correlation between different genotypes and response to treatment.

Variable	Variable	Rank correlation coefficient	P value	Significance
KM 1 carrier	Response	–0.3	>0.05	NS
KM1,3 zygousity	Response	0.402*	<0.05*	S
GM 3,17 zygousity	Response	–0.1	>0.05	NS
GM3 carrier	Response	0.2	>0.05	NS
GM 23 carrier	Response	0.2	>0.05	NS
GM 23 zygousity	Response	–0.1	>0.05	NS

4. Discussion:

The present study showed that the KM genotypes (global distribution) were associated with the treatment outcome. This was statistically significant were p Value <0.05*, on the other hand non of the KM alleles has statistically significant difference as regard the treatment outcome in this study.

The present study showed relative increase in the SVR in KM1 non carriers ; where as the KM3 homozygousity was associated with 58 % SVR, while the KM1 carriers (KM 1/3 and KM 1) showed 25 % SVR ,but the results did not reach a statistical significance. This is in comparison to *Pandey and Kristner-Griffen (2011),* where the percentages of SVR in AA KM1 non carriers and carriers are 33.3% and 16.7% respectively, while the percentages of SVR in CA KM1 non carriers and carriers are 51 % and 60.9% respectively, with p value 0.024 in AA and 0.378 in CA respectively. This may suggest a relative effect of KM3 homozygousity on the treatment outcome.

At least three mechanisms, which are not mutually exclusive, could explain these observations. The KM3 allele could be directly involved in humoral immunity to HCV. Where another study showed that IgG1 aβab levels were higher in patients with KM3/KM3 genotype compared with patients with KM3/KM1 genotype *(Ciofu et al., 1997).* Second, it could indirectly contribute to the cellular immunity to HCV epitopes mediated by CD8^{+} T cells. Genes

encoding CD8 glycoproteins and KM allotypes are very closely linked, both located on the same band (p12) of human chromosome 2. In addition, both CD8 α and β chains share significant homology with the κ light chain. Thus, KM3 could be a marker for enhanced HCV-specific CD8^{+} T-cell activity through significant linkage disequilibrium with a cis-acting enhancer element in the CD8 gene complex *(Pandey and Kristner-Griffen, 2011).* Third, increased HCV-specific CD8^{+} T cell responses are associated with SVR to peginterferon-ribavirin therapy for chronic HCV infection *(Tatsumi et al., 2010).*

In the present study there was a statistically significant difference; p Value <0.05* , between KM genotype homozygousity and end of treatment response , where KM homozygous patients (patients were mostly homozygous to KM3 where only one patient was homozygous for KM1 genotype) showed increased end of treatment response than the KM heterozygous patients (adding the SVR and relapsers).

On the other hand the homozygousity (mostly KM3 homozygousity) approached significance in SVR versus no treatment response p value=0.057, however, there was significant rank correlation between the KM zygousity and treatment outcome with $p<0.05*$, where the homozygotes have 6.75 times (=exp (1.91)) the odds of being SVR as those who are heterozygotes i.e the KM homozygousity is associated with six fold increase in treatment response. Comparable to this a previous study done where,

noncarriage of KM1 allele, i.e., KM3 homozygosity, was associated with higher SVR in African Americans (odds ratio =2.50, 95% confidence interval=1.12–5.60). Thus, the KM3 allele may be a marker for higher SVR in African Americans *(Pandey and Kristner-Griffen, 2011)*. This have a relation to a study done by *Scherzer et al.(2011),* where IL28B polymorphism modulate early virologic respose to peginterferon/ribavirin treatment. In contrast to HCV genotype 1 patients, no effect on SVR rates was observed in genotype 3 patients. The clinical relevance of an earlier viral decline in C/C patients needs to be determined.

This was confirmed by another study where; AA with C/C and C/T genotypes had lower week 24, 48, and 72 (SVR) rates than did CA (p = 0.03). SNP C/C predicted higher SVR rates in AA and CA with high baseline HCV RNA (600,000 IU/ml), and in CA with 1 log10 IU/ml decrease in HCV RNA from day 0 to 28 *(Howell et al.,2011).* This is also comparable to another study where in patients with Burkitt lymphoma, simultaneous homozygosity or heterozygosity at GM (chromosome 14) and KM (chromosome 2) loci resulted in higher antibody responses to EBV antigens than did dissimilar zygosity at the 2 loci *(Biggar et al.,1984).*

We recommend that κ and γ chain determinants of immunoglobulin genes (KM and GM allotypes) be used as a predictor to response before treatment, but future studies are needed to assess the efficacy of this prediction. This may save time and money and decrease the burden on the patients and the health care system.

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The relationship between obesity and symptoms of puberty among the adolescent females

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Abstract: Background: Puberty is a normal process of physical changes that occurs when a child's body transitions into an adult body. Over weight and obesity in adolescence stage are important predictors of adult obesity and predict elevated adult mortality and cardiovascular diseases rates. **Aim**: 1) To examine the body mass index distribution among adolescent females. 2) To identify the relationship between obesity and symptoms of puberty. **Design**: Across-Sectional design was used .**Sample**: The total sample was 200 students. Their ages were ranged were ranged from 12 years to less than 21 years. **Tools**: The Researchers used three tools to collect the data. An interviewing questionnaire, an assessment tool, and growth chart. **Result**: The mean age of the studied sample was 16.2 ± 1.6 years old, and the mean of body mass index of the obese group was 34.4 ± 4.9 kg /m$^{2.}$ The puberty age of more than two-third of the over-weight group ranged between 11-12 years. The mean age of menarche was 12.6 ± 1.3 years. There were a statistically significant differences between obesity and menstrual irregularity ($P<0.05$). Regarding to dietary habits, there were 77.3% of the obese girls ate fatty foods and the majority of them (90.9%) were ate fast foods. In addition, 86.4% of the obese group drank soft drinks (beverages). There were a statistical significant differences between body mass index categories in relation to age of puberty and appearance of secondary sexual characteristics ($P<0.05$). **Conclusion**: The present study concluded that, obesity among adolescent females is an important concern. It can cause early puberty symptoms and menstrual irregularity. Also there were bad eating habits among adolescents that help them to have more fats and become obese. This can impact on their health.

1. Introduction

Adolescence is the transitional stage of physical and mental human development that occurs between childhood and adulthood. This transition involves biological, social and psychological changes. Puberty has been heavily associated with teenagers and the onset of adolescent development (**Christie, 2008**). Adolescence essentially begins when physiologically normal puberty starts and ends when the person develops an adult identity and behavior. This period of development corresponds roughly to the period between the ages of 10 and 19 years. Also, adolescence is usually accompanied by an increased independence allowed by the parents or legal guardians and less supervision, contrary to the preadolescence stage (**Hill, 2008**).

The overweight and obesity are serious public problems in children and adolescents and urgent measures are needed to suppress this epidemic and reverse the situation as soon as possible (**Antune & Moreira, 2011**). Worldwide, childhood obesity has risen to epidemic proportion (**WHO, 2006**). Dramatic increasing in the prevalence of obesity and overweight among children and adolescent are reported over the past three decade in both developed and developing countries (**James, 2004**). Generally obesity is prevalent in Saudi Arabia. Children from urban areas were more

overweight and obese (**Al Qahtani, 2009**). Specifically in the Middle East region and in the KSA in particular, obesity has become a major health problem among all age groups (**Musaiger, 2004**), and the primary prevention of it become at the forefront of current public and community health concern. the prevalence of obesity in KSA was 23.3% and more than 50% of children between 14 and 18 years had weight above the 85th percentile (**Al-Dossary, 2010**). Risk factors for childhood obesity are parental work in a private sector and parental education, socioeconomic status, physical inactivity and a family history of obesity (**Al Qahtani, 2009**). In addition the other factors contributing to obesity include increases in calories and fast food consumption, and increases in television viewing (**Frank, et al, 2005**).

Obesity and overweight in childhood have significant impact on both physical and psychological health for examples, obesity and overweight, are recognize as a major independent risk factor for many chronic diseases such as Cardiovascular disease, diabetes, musculoskeletal disorders and cancer ,as well as Obese Child has a higher chance of premature death and disability in adulthood (**Daniels et al., 2005**). In addition, overweight children and adolescents are at greater risk of adult obesity (**Reilly, 2003**).

Excess adiposity during childhood may influence pubertal development as well. In particular, obesity during childhood may lead to early signs of puberty in girls and delay puberty in boys. High androgen concentrations related to obesity in pre-pubertal girls could lead to earlier pubertal onset (**Christine et al , 2010**). Earlier puberty in girls appears to be associated with a higher risk of psychological problems, risk-taking behavior, and even future breast cancer (**Golub et al., 2008**). Also childhood levels of obesity associated with earlier menarche in girls (**Frank, et al, 2005**).

Aims of the study
1- To examine the body mass index distribution among adolescent females.
2- To identify the relationship between obesity and symptoms of puberty.

2. Subjects and Methods
1- The present study was carried out with the aim of
   a. Examine the body mass index distribution among adolescent females
   b. To identify the relationship between obesity and symptoms of puberty.

Research Design
Across-Sectional design was used to examine the body mass index distribution among adolescent students and to identify the relationship between body mass index categories and symptoms of puberty among adolescent students in the schools at Shaqra governorate.

Setting
The study was conducted at the schools of girls (Intermediate and Secondary schools) at Shaqra Governorate.

Subjects
The total sample was 200 students, the inclusion criteria of these students included were:
▪ Age: from 12 years to less than 21 years.
▪ All levels of the students in the school (intermediate and secondary school) included.
▪ All students study at Shaqra governorate.

Data collection tools
The Researchers used three tools to collect the data, namely an interviewing questionnaire sheet for the students, an assessment tool for the students, which designed by the researchers based on review of pertinent literature, and were finalized after being revised by the professors, and college experts. The third tool adopted from textbooks and magazines.

Validity was determined by the professors and experts of the college who reviewed this instrument and judged it to measure what intended to be measured. Reliability was assessed by applying the tools on small number of students (10) who were excluded from the study.

• **Tool I**. Interviewing Questionnaire which includes personal data of the students, family history and the presence of obesity or not.
• **Tool II**. Assessment sheet which include measurement of the weight, height abdominal & hip circumferences, for all students. It also includes the history of the menstruation and its characteristics. The assessment sheet also includes eating habits, sleep hours, sports and drinking the soft drink.
• **Tool III**: growth chart. To compare the B.M.I with the age of the students and identify if they (under weight, healthy, overweight, and obesity) for each students.

Pilot study
A pilot study was conducted to test the feasibility and applicability of the tools and the maneuvers of the interventions, and to estimate the time needed. It was carried on to 10 students.

Study maneuver
Data were collected through an interview and complete assessment of all students.

Student's assessment:
After complete history was taken from the student, the investigator performed measuring the anthropometric measurements like (the student weight, the student height, the abdominal and hip circumferences) then Body Mass Indexes were calculated manually by the formula (weight by K.G. divided by the square of the height by meter) for each student and take a score on the growth chart (under weight, healthy weight, overweight, and obesity). The investigators used special program from net to recalculate and to be sure about the body mass index categories.

Procedure
Before starting any step in the study, official letters were issued from the dean of the faculty of Applied Medical Sciences, Shaqra University to the directors of the Schools where the study was intended to be done. The letters explained the aim of the study, and solicited permission to carry it out. They have also emphasized the confidentiality of any obtained information. Data collection was during the first semester of academic year 1432-1433H (2011-2012).

Human Rights and Ethical Considerations
The subjects were chosen according to the criteria and they were interviewed after their informed consent was obtained to participate in the study. The researchers approached each student by giving her an overview of the study, and explained the procedures. The researchers also reassured the subjects that their privacy would be protected, and that any obtained information would be strictly confidential.

Statistical analysis
The collected data were coded for entry and analysis (SPSS) statistical soft ware package version

(16). Data were presented using descriptive statistics in the form of frequencies and percentage. Quantitative variables were presented in the form of means and standard deviation. Qualitative variables were compared using chi-square test. Statistical significance was considered at *p*- value <0.05.

3. Results

Table (1) Shows the socio demographic characteristic of the studied sample. The mean age of the sample was 16.2±1.6 years. As regards the educational level, the majority of the over-weight and obesity group were in the secondary school (90.6 %). In relation to socio-economic level; more than half of the over- weight had a high economic level (51.9%). As regards family history of hereditary disease; about half of the obesity group (45.5%) had heredity disease and 40.7% of the over-weight group had history of obesity in the family.

Figure (1) illustrated that, 40.7% of the overweight girls have history of obesity in the family.

Table (2) shows the anthropometric measurements of the studied sample. There was a highly statistical significant difference between body mass index categories in relation to weight, abdominal circumference, and hip circumference (P<0.001*).

Table (3) shows the relationship between B.M.I Categories & puberty age, appearance of secondary sexual characteristic of the sample. The puberty age of more than two-thirds of the over-weight group (66.7%) ranged between 11-12 years old. In addition, there was a statistically significant difference between BMI categories in relation to appearance of secondary sexual characteristics (P<0.05).

Table (4) shows relationship of B.M.I categories & menstrual characteristics of the studied samples. The mean age of menarche was (12.6 ±1.3 years), with statistical significant difference between BMI categories in relation to age of menarche and menstrual regularity (P<0.05). Regarding to dysmenorrheal, the majority of obese girls have dysmenorrheal (95.0%).

Figure (2) revealed that, the majority of girls with healthy weight had regular menstruation (89.9%). On the other hand, 40% of the obese girls had irregular menstruation.

Table (5) shows that, 77.3% of obese girls were ate fatty foods, and 86.4 of them preferred soft drinks.

Figure (3) illustrated that, 4.5% of obese students were suffered from chronic disease (diabetes mellitus), and 13.6 % of them were complained from psychological problems due to obesity.

Table (1): Socio Demographic characteristics of the studied sample.

Variables	Under weight n=59	Healthy weight n=92	Over weight n=27	Obesity n=22	Total n=200	
	29.5%	46.0%	13.5%	11.0%	No.	%
Educational level						
• Intermediate school	28.8	3.3	3.7	9.1	23	11.5
• Secondary school	71.2	96.7	96.3	90.9	177	88.5
	$x^2 = 25.2$ P<0.001*					
Socio-economic level of the family						
• Low	0.0	0.0	0.0	4.5	1	0.5
• Middle	44.0	46.7	40.7	50.0	91	45.5
• High	49.2	42.4	51.9	18.2	86	43.0
• Very high	6.8	10.9	7.4	27.3	22	11.0
	$x^2 = 19.12$ P<0.05*					
Family history for heredity diseases						
• Yes	44.1	32.6	44.4	45.5	78	39.0
• No	55.9	67.4	55.6	54.5	122	61.0
	$x^2 = 2.9$ P>0.05					
Obesity in the family						
• Yes	25.4	35.9	40.7	3.8	66	33.0
• No	74.6	64.1	59.3	68.2	134	67.0
	$x^2 = 10.7$ P>0.05					
Age (Mean±SD)	16.2 ± 1.6					

Table (2): Anthropometric measurements of the studied sample.

Variables	Under weight Mean ± SD	Healthy weight Mean ± SD	Over weight Mean ± SD	Obesity Mean ± SD	P-value
• Weight	40.9±5.8	53.7± 8.1	67.2±5.7	83.6±16.1	P<0.001[*]
• Height	155.3±6.6	157.2±11.9	153.1±18.7	158.4±5.1	P>0.05
• Abdominal circumference	62.2±5.5	69.1± 6.2	78.4±8.1	89.3±12.6	P<0.001[*]
• Hip circumference	83.6±7.9	93.3±6.7	104.8±7.6	114.7±10.5	P<0.001[*]
• Body mass index	16.6±1.5	21.2± 1.9	27.3±1.4	34.4±4.9	P<0.001[*]
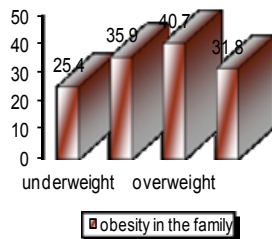
Figure (1): Relationship between B.M.I Categories and presence of obesity in the family.

Table (3): B.M.I categories in relation to puberty age, and appearance of secondary sexual characteristic of the sample.

Variables	Under weight n=59 29.5%	Healthy weight n=92 46.0%	Over weight n=27 13.5%	Obesity n=22 11.0%
Puberty age				
• 9-10 years	0.0	1.1	3.7	9.1
• 11-12 years	35.6	37.0	66.7	40.9
• 13-15 years	45.8	56.5	25.9	40.9
• More than 15	0.0	3.3	0.0	0.0
• No	18.6	2.2	3.7	9.1
	$X^2 =$ 33.5 P<0.001*			
Secondary sexual characteristic such as breast development, axillaries' & pubic hair				
• Yes	79.7	97.8	92.6	90.9
	$X^2 =$ 16.6 P<0.05*			

Table (4): Relationship between B.M.I. Categories & Menstrual Characteristics of The menstruated Studied girls (n=181).

Variables	Under weight n=46 %	Healthy weight n=89 %	Over weight n=26 %	Obesity n=20 %	P-value
• Mean age of menarche	12.6 ± 0.9	12.8±1.4	11.8± 1.3	12.5± 1.4	P<0.05*
	12.6 ±1.3				
Regularity of menses					
• Regular	80.4	89.9	84.6	60.0	P<0.05*
• Irregular	19.6	10.1	15.4	40.0	
Duration of menses					
• less than 2 days	10.9	16.9	3.8	5.0	
• 2-4 days	17.3	13.5	30.8	15.0	P>0.05
• 5-7 days	60.9	62.9	61.6	75.0	
• More than 7 days	10.9	6.7	3.8	5.0	
Amount of menses					
• Scanty	6.5	11.2	15.4	25.0	
• Moderate	65.2	65.2	76.9	70.0	P>0.05
• Heavy	28.3	23.6	7.7	5.0	
Dysmenorrhea					
• Yes	82.6	86.5	92.3	95.0	P>0.05

Table (5): B.M.I Categories & dietary habits of studied sample.

Variable	Under weight n=59	Healthy weight n=92	Over weight n=27	Obesity n=22	P-value
Drinking tea & coffee					
• Yes	55.9	59.8	5.6	50.0	P>0.05
• No	44.1	40.2	44.4	50.0	
Fatty foods					
• Yes	62.7	78.3	48.1	77.3	P <0.05*
• No	37.3	21.7	51.9	22.7	
Fast foods					
• Yes	89.8	89.1	74.1	90.9	P >0.05
• No	10.2	10.9	25.9	9.1	
Soft drink					
• Yes	64.4	72.8	70.4	86.4	P >0.05
• No	35.6	27.2	29.6	13.6	
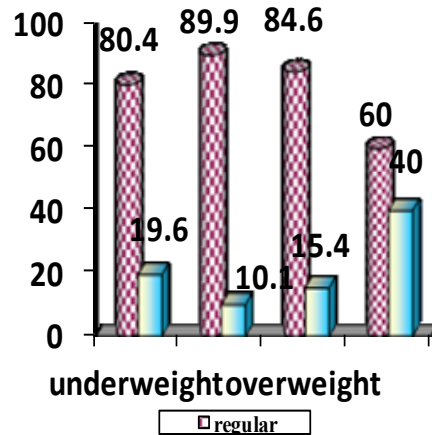
Figure (2): Relationship between B.M.I categories & menstrual regularity of the studied sample
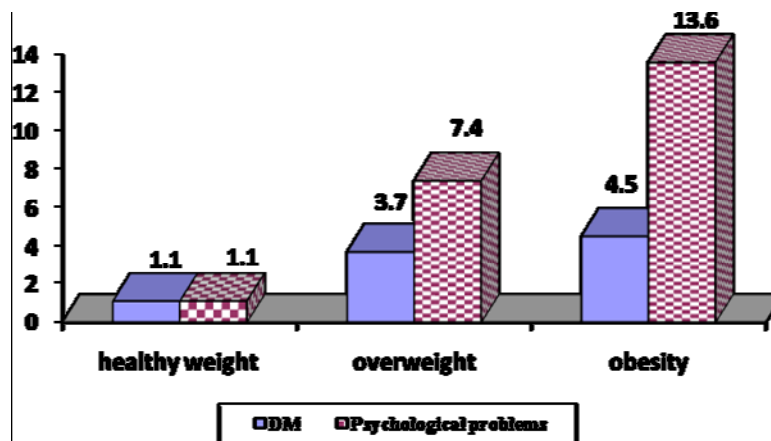
Figure (3) Relationship between obesity and presence of health problems of the studied sample

4. Discussion

Adolescence is the period of transition from childhood to adulthood (***Sigh et al., 2006***). The overweight and obesity are serious public problems in children and adolescents (***Antunes & Moreira, 2011***). The increasing problem of obesity has been reported from different regions in the kingdom (***Al Qauhiz, 2010***). The present study aimed to examine the body mass index distribution among adolescent females and to identify the relationship between obesity and symptoms of puberty.

Socio-demographic characteristics of the studied sample indicated that, the mean age of the students was 16.2±1.6 years old (Table 1), also more than three quarters of the sample (88.5%) were studying in the secondary school, this means that, all students were in an adolescence stage where the transitional from childhood to adulthood is rapid. In the current study the mean age of menarche was 12.6±1.3. This comes in agreement with ***Singh et al. (2006)*** who stated that, the age of menarche can ranged from 12 to 15 years old. Also, this was confirming with ***Jannelli (2005)*** who

mentioned that, the first period or menarche occurring at an average age of 12.5 to 13 years old.

Regarding to anthropometric measurements for the students, the present study explained that, the mean weight of the obese adolescent students was 83.6±16.1 kg (Table 2), while the mean height of them was 158.4±5.1cm, and the mean of BMI was 34.4±4.9 kg/m^2. These findings are in an agreement with ***Wronka, 2010***,and ***Yaruratanasirikul, et al, 2011*** they indicated that, the over age of Near-Final Height of the girls with early puberty was (154±4.9cm). They concluded that, obese girls attained near final height (NFH) at an earlier age and had the same NFH normal-weight girls (***Townsend et al., 2011***). Also ***EL-Gilany et al., 2010*** , and ***Kleber et al., 2011***explained that, obese children are taller than normal weight children up to the age of 14 years. Since obese children demonstrated pubarche, menarche and voice break later than their normal weight peers.

Rosenfield, et al *(2009)* mentioned that, the early onset of puberty may be related to obesity, so there is a need to know the prevalence of early pubertal milestones in non overweight children. Girls with

excessive BMI had a significantly higher prevalence of breast appearance from ages 8.0 through 9.6 years and puberties from ages 8.0 through 10.2 years than those with normal BMI. The present study stated that, the puberty age of more than two-thirds of the over-weight group ranged between 11-12 years old (Table 3). In addition, there was a statistically significant difference between BMI categories in relation to appearance of secondary sexual characteristics (P<0.05). Also, the present study showed that, the mean age of menarche was earlier in the overweight adolescent students (11.8± 1.3) than the healthy weight girls (12.8±1.4).

These findings are in an agreement with many researchers (*Mesa et al., 2010*) and (*Zaghloul et al., 2011*) who indicated that, the mean age of menarche was 12.4 years old and the prevalence of menarche before age 12 years was 24.3% when studying girls who experienced rapid growth. Also (*Wronka, 2010*) explained that, the inverse correlation between BMI values & age of menarche. *Novotny et al., (2011)* explained that female adolescent breast density was negatively associated with body fatness and positively associated with menarche.

There was a statistical significant difference between BMI categories in relation to age of menarche and menstrual regularity (*P*<0.05). Regarding to dysmenorrheal, the majority of obese girls have dysmenorrheal (95.0%). (Table 4). Also, 40% of the obese girls had irregular menstruation (Figure 2). These findings are in an agreement with (*Souza et al., 2010*), they mentioned that, the presence of obesity can cause menstrual dysfunction such as amenorrhea or oligomenorrhea.

AL-Qauhiz (2010) studies the obesity among Saudi female university students and indicated that, the frequency of drinking aerated beverages increased the risk of obesity significantly. This comes in agreement with the current results which stated that, that, 77.3% of obese girls were ate fatty foods, and 86.4 of them preferred soft drinks (Table 5).

But this findings are in contrast with *AL Rethaiaa et al., 2010* and *ALQauhiz, 2010 Trainer, 2010* who concluded that by analysis of dietary habits and life styles indicated that the predominance of unhealthy behaviors. They concluded also, both BMI and VFL had significant inverse correlation with the frequency of eating fatty & fast foods.

Trainer (2010) explained that, The United Arab Emirates now have some of the highest proportion of obese/overweight people in the world, with correspondingly high rates of chronic disease. These results come in agreement with the present study which reported that 4.5% of obese students were suffered from chronic disease (diabetes mellitus), and 13.6 % of them were complained from psychological problems due to obesity (Figure 3).

Conclusion:
Based on the results of the present study, the following were concluded:

- The overweight and obesity had an effect on the occurrence of menarche, becoming earlier than other group, menstrual regularity and presence of dysmenorrheal problem.
- There was a need for changing the eating habits for the adolescence such as reduce the eating of fatty foods and avoid drinking of soft drinks to prevent obesity in early ages.

Recommendations
1- Early detection of obesity by using the BMI indicator to maintain healthy puberty.
2- Encourage the adolescent girls to eat healthy diet and avoid fatty foods and soft drinks to avoid obesity and its complications.
3- Incorporating the health education programs about effect of obesity on health and importance of maintaining healthy weight in some of school subjects to increase the adolescence girls' knowledge.

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Inhibition of endogenous nitric oxide promotes p53-dependent apoptosis induced by cisplatin in human colon cancer cells

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Abstract: Endogenous nitric oxide (NO$^\bullet$), a reaction product of NO$^\bullet$ synthase (NOS) isoenzymes, appears to suppress apoptosis and promote growth of cancer cells, suggesting that its inhibition is a rational therapeutic approach. We report here the chemoadjuvant potential of NO$^\bullet$ modulators on cisplatin-mediated cell killing/apoptosis in two isogenic HCT116 human colon carcinomas with distinct p53 status. Cells were treated with either cisplatin alone or in combination with three NOS isoform-selective inhibitors, namely an inducible NOS inhibitor 1400W, a neuronal NOS inhibitor Vinyl-L-NIO and an endothelial NOS inhibitor gallotanin, and an NO$^\bullet$ scavenger carboxy-PTIO. We found that inhibition of endogenous NO$^\bullet$ enhanced cisplatin-induced apoptosis in cells harvested 48 hours after treatments through induction of cell cycle change and down-expression of X-linked inhibitor of apoptosis (X-IAP). Apoptosis was delayed in p53-null HCT116 cells, underscoring the importance of p53 modulation of the response. The data suggests that inhibition of endogenous NO$^\bullet$ may improve the efficacy of chemotherapy for colon cancer by inducing p53-mediated apoptosis.
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Keywords: endogenous nitric oxide; HCT116 cells; cisplatin; apoptosis; p53

1. Introduction

Colon cancer is one of the most common malignancy of the gastrointestinal system which has traditionally been a leading cause of cancer mortality in western countries. However, during the past few decades, there have been remarkable changes in the incidence of colorectal cancer in Asian counties (Sung et al., 2005). For instance, colon cancer was the third most commonly diagnosed cancer in Korea (13% of all cancer diagnoses, Korea National Cancer Information Center, Cancer incidence 2009). Current evidence indicates that dysregulated production of nitric oxide (NO$^\bullet$) is an important factor in the etiology of this disease (Ekmekcioglu et al., 2005; Hussain and Harris, 2007)

NO$^\bullet$ is produced by three isoforms of the enzyme nitric oxide synthase (NOS), neuronal NOS (nNOS, NOS1), inducible NOS (iNOS, NOS2) and endothelial NOS (eNOS, NOS3), which can regulate a number of important biological functions, as well as playing critical roles in the anti-pathogen response of the immune system (Xu et al., 2002; Wink et al., 1998; Nathan and Xie, 1994). However, the role of NO$^\bullet$ in cancer is multi-dimensional, depending on timing, location and concentration (Wink et al., 1998). Some reports have indicated that low levels of NO$^\bullet$ produced endogenously by tumor cells may reduce their metastatic potential (Kubes et al., 1991; Kubes et al., 1993). By contrast, NO$^\bullet$ has been proposed to be an important mediator of tumor growth (Mordan

et al., 1993; Gottke and Chadee, 1996). These observations suggest that manipulation of NO$^\bullet$ may offer exciting opportunities to improve the effectiveness of cancer treatment.

Cisplatin is a potent antineoplastic agent used for the treatment of a wide range of cancers (Saad et al., 2004; Wang et al., 2004). Recent reports indicate that constitutive production of endogenous NO$^\bullet$ has an antiapoptotic function promoting survival of human melanoma cells and the depletion of endogenous NO$^\bullet$ leads to increased sensitivity to cisplatin (Salvucci et al., 2001; Tang and Grimm, 2004). In the present study, we investigated the susceptibility of human colon cancer cells to cisplatin induced apoptosis by modulating endogenous NO$^\bullet$ using three NOS isoform-selective inhibitors, namely an iNOS inhibitor 1400W, a nNOS inhibitor Vinyl-L-NIO and an eNOS inhibitor gallotanin, and an NO$^\bullet$ scavenger carboxy-PTIO (c-PTIO). In addition, wild-type p53 (p53+/+) and p53-null (p53-/-) HCT116 cells were used experimentally to evaluate the influence of p53 status.

2. Material and Methods
2.1. Cell cultures and chemicals

Two isogenic HCT116 colon carcinoma cells (p53+/+ and p53-/-), kindly provided by Dr. G.N. Wogan (Massachusetts Institute of Technology, USA), were cultured in McCoy's 5A medium supplemented with 10% heat-inactivated fetal bovine

serum, 100 units/mL penicillin, 100 μg/mL streptomycin and 2 mM L-glutamine at 37 ºC with 5% CO_2 in a humidified atmosphere. Sources of reagents were as follows: cell culture reagents, Lonza (Walkersville, MD, US); 1400W dihydrochloride, 2-(4-Carboxyphenyl)-4,4,5,5-tetramethylimidazoline-1-oxyl-3-oxide (c-PTIO), gallotannin, sodium nitroprusside (SNP), tri reagent and GenElute™ mammalian genomic DNA miniprep kit, Sigma Chemical (St. Louis, MO, USA); Vinyl-L-NIO hydrochloride, Enzo Life Sciences (Ann Arbor, MI, US); N-methyl-L-arginine monoacetate (NMA) and cisplatin, CalBiochem (Salt Lake City, UT, USA); cell proliferation kit I (MTT) from Roche (Indianapolis, IN, USA); annexin V-FITC apoptotic assay kit, Clontech Laboratories (Palo Alto, CA, US); TOP script™ one-step RT PCR kit (Enzynomics, Daejeon, Korea).

2.2. Cell viability assay

Cell viability was determined by 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) colorimetric assay. Cells were plated one day before treatment in 96-well plates at a density of 5×10^4 cells/well and were treated with indicated concentrations of NO$^{\bullet}$ modulators alone or in combination with cisplatin and/or SNP for the designated time points. After the cultivation, 10 μL of MTT (5 mg/ml) was added and incubated at 37 ºC in the dark for 4 h, and the formazan product was dissolved by mixing it with 100 μL of 10% SDS in 0.01M HCl. Absorbance was determined spectrophotometrically at 550 nm with a Packard EL340 microplate reader (Bio-Tek Instruments, Winooski, VT, US). The relative percentage of cell survival was calculated by dividing the absorbance of treated cells by that of the control in each experiment. Results from the MTT assay has been used to derive the 50% effective concentrations (EC_{50}) of each drug to induce growth inhibition.

2.3. Measurement of nitrite production

NO$^{\bullet}$ production was assessed by measuring nitrite in media fractions by the Griess reaction as previously described (Jorens et al., 1991). Nitrite concentrations were determined from a standard curve using sodium nitrite at concentrations ranging from 1.25 to 20 μM. Optical density was measured using a microplate reader at 540 nm, with fresh culture media serving as the blank. Results are expressed in pmoles per 10^7 viable (trypan blue-excluding) cells.

2.4. Apoptosis detection

Two million cells were incubated in a 60-mm tissue culture dish containing cisplatin alone or

in combination with NO$^{\bullet}$ modulators. Cells were harvested by trypsinization and centrifugation, then analyzed in a FACScan flow cytometer (BD Bioscience, San Jose, CA, USA; excitation at 488 nm) equipped with CellQuest software after staining with annexin V-FITC and propidium iodide by annexin V-FITC apoptotic assay kit following the manufacturer's protocols (Clontech). Apoptotic cells stained with annexin V (early apoptosis) or with both annexin V and propidium iodide (late apoptosis), necrotic cells stained with propidium iodide, and living cells did not contain either stain.

2.5. Cell cycle analysis

Cells were seeded in 100-mm tissue culture dishes at a density of 2×10^6 cells/mL and treated with cisplatin alone or in combination with NO$^{\bullet}$ modulators at the indicated times. The cells were harvested, washed twice with PBS and fixed in 70% ethanol on ice for 30 min. The cells were further stained with 500 μg/mL of PI on ice, incubated with 10 μg/mL of ribonuclease A digestion at 37 ºC for 30 min and subjected to flow cytometric analysis. Phase distributions were calculated from the resultant DNA histogram using CellQuest software, and expressed as a percentage of cells in the respective phases.

2.6. Semiquantitative RT–PCR analysis

Total RNA was extracted by using the Tri reagent (Sigma) and semiquantitative RT-PCR analysis was performed using the TOP script™ one-step RT PCR kit (Enzynomics, Daejeon, Korea) following the manufacturer's protocol. Primer sequences were as follows: for X-IAP, sense 5′-ACACCATATACCCGAGGAAC-3′, antisense, 5′-CTTGCATACTGTCTTTCTGAGC-3′; for actin, sense 5′-GGTCATCTTCTCGCGGTTGGCCTTGGGGT-3′, antisense 5′-CCCCAGGCACCAGGGCGTGAT-3′. A total of 2 μg of total RNA was used in each reaction and was amplified within the exponential phase of the PCR (X-IAP, 32 cycles; actin, 30 cycles). Reactions were normalized by evaluating the level of amplification of the actin transcript. Amplified DNA was electrophoresed on 1.5% agarose gels and visualized by ethidium bromide staining.

2.7. Statistical analysis.

Data are presented as mean ± SD. Comparisons between treatment groups were made with the one-way analyses of variance followed by Mann-Whitney U test (SPSS 12.0). Values of $p < 0.05$ were considered statistically significant.

3. Results and Discussion

Cells treated with gallotannin (0.01-0.06 mM), c-PTIO (0.1-0.4 mM), 1400W (1-4 mM), Vinyl-L-NIO (1-4 mM) and NMA (1-4 mM) for 48 h responded with respect to viability, in that all treatments decreased the percentage of viable cells dose-dependently (Figure 1A). The median effective concentration EC_{50} of with gallotannin, c-PTIO, 1400W, Vinyl-L-NIO and NMA to cause cell growth inhibition was found to be 0.04, 0.19, 2.21, 2.34 and 4.03 mM, respectively, which indicates that endogenous NO• was implicated in increased colon cancer cell growth.
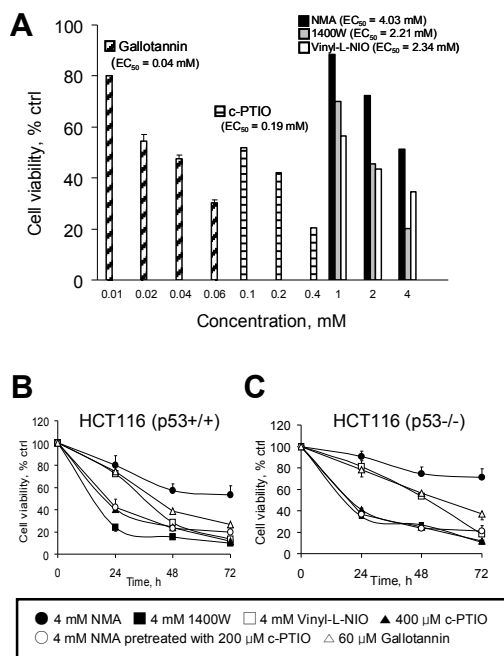
Fig. 1. Cell viability of two isogenic HCT116 cell lines after NOS inhibition by NMA, Vinyl-L-NIO, 1400W and Gallotannin, or NO• scavenging by c-PTIO. (A) The p53+/+ HCT116 cells were treated with the various concentrations of NO• modulators for 48 h. The p53+/+ (B) and p53-/- (C) HCT116 cells were incubated at indicated concentrations (*box*) of NO• modulators for 24, 48 and 72 h. Results are presented as a percentage of control cells (mean ± SD, n=3).

We then assessed the time-course of responses to doses of which showing below EC_{50}, with gallotannin, c-PTIO, 1400W, Vinyl-L-NIO and NMA, in HCT116 (p53+/+ and p53-/-) cells treated for 24, 48 and 72 h (Figures 1B and C). As expected, viability decreased in a time-dependent manner, and HCT116p53^{-/-} cells were resistant to NO• modulators-induced cell death in comparison with HCT116 with wild-type p53, suggesting a role for the p53 status in cancer cell death induced by NO• modulators (Figures 1B and C). The tumor suppressor p53 is a sensor of diverse cellular stresses,

which is the most commonly mutated gene in a broad spectrum of cancers, and its inactivation is frequently associated with tumor progression, resistance to therapy, and poor prognosis (Bargotti and Manfredi, 2002; Tang and Grimm, 2004).
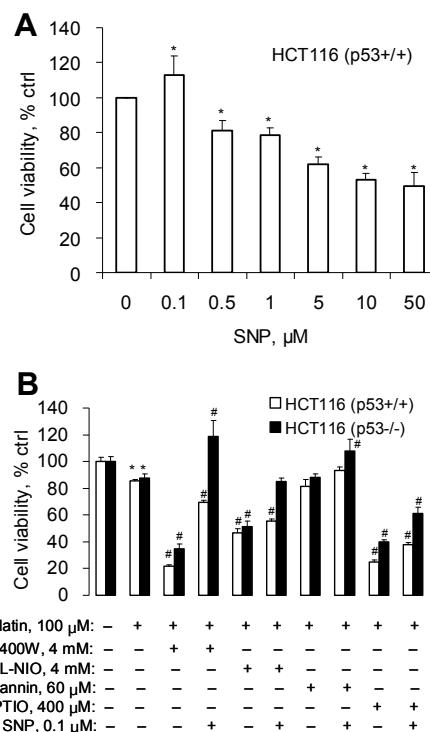
Fig. 2. Regulation of HCT116 cell growth by endogenous NO•. (A) HCT116 cells were treated with 0-50 μM of SNP (NO• donor) for 24 h, and cell viability was determined by MTT assay. (B) HCT116 cells (p53+/+ and p53-/-) were treated with 100 μM of cisplatin alone or combined with NO• modulators and/or 0.1 μM of SNP. Results are presented as a percentage of control cells (mean ± SD, n=3). *$p < 0.05$ versus control; #$p < 0.05$ versus cisplatin.

Next, we evaluated whether endogenously produced NO• enhanced the proliferation of colon cancer cells. The NO• donor SNP was used to modulate NO• level in the cells for 24 h, after which cell viability was measured. The addition of 0.1 μM SNP led to an increase in cell growth ($p < 0.05$) (Figure 2A). Treatment of cells with more than 0.1 μM SNP caused a dose-dependent decrease in cell viability, suggesting that low levels of NO• enhances cell growth, whereas higher NO• concentrations lead to inhibition of growth ($p < 0.05$) (Figure 2A).

To assess whether endogenous NO• modulation regulates growth inhibition after cisplatin treatment, we incubated cells with cisplatin alone or in combination with 1400W, Vinyl-L-NIO, gallotannin and c-PTIO (Figure 2B). Cell viability significantly decreased by 85 and 87% after cisplatin treatment in HCT116 (p53+/+ and p53-/-) cells,

respectively ($p < 0.05$). When cells were co-incubated with both cisplatin and NO$^•$ modulators, viability significantly decreased by 4- and 2.5-folds over that which was induced by cisplatin alone in HCT116 (p53+/+ and p53-/-) cells, respectively ($p < 0.05$), suggesting an additive or synergistic effect between cisplatin treatment and endogenous NO$^•$ depletion. The concomitant addition of SNP, a NO$^•$ donor, with NO$^•$ modulators caused cell re-growth, which indicates that the antiproliferative effect was specific to endogenous NO$^•$ depletion (Figure 2B).
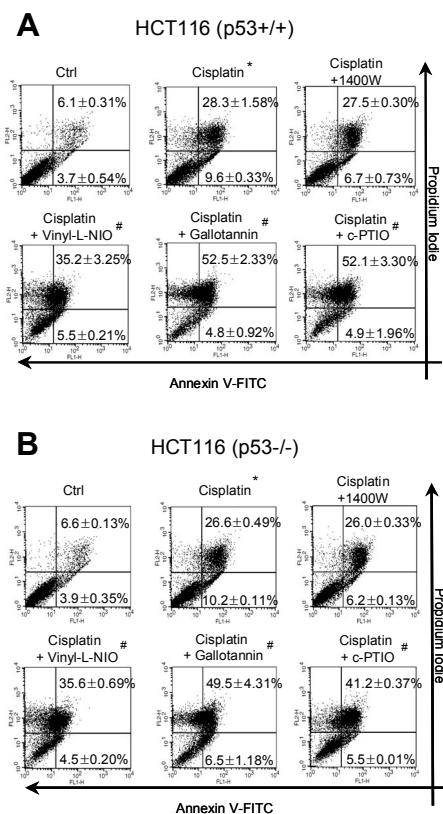
Fig. 3. Effects of NO$^•$ modulators on cellular nitrite level by cisplatin treated for 48 h in HCT116 cells (p53+/+ and p53-/-). Results are presented as a percentage of control cells (mean ± SD, n=3). $^*p < 0.05$ versus control; $^#p < 0.05$ versus cisplatin.

To confirm that antiproliferative effects of NO$^•$ modulators on cisplatin, we measured nitrite levels in HCT116 (p53+/+ and p53-/-) cells (Figure 3). Cisplatin (100 µM, 48 h) significantly decreased nitrite generation by around 85%, as compared with controls, and the increases were further enhanced by combination treatment with NO$^•$ modulators in HCT116 cells ($p < 0.05$) (Figure 3). HCT116p53-/- cells produced nitrite at higher concentrations than HCT116p53+/+ cells (Figure 3); for example, the concentration in HCT116p53-/- cells (5 pmoles/10^7

cells) was 1.6 times that of HCT116p53+/+ cells (3 pmoles/10^7 cells) after 48 h of co-treatment with cisplatin and 1400W (Figure 3).
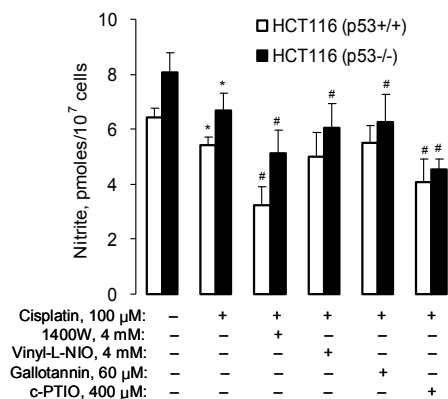
Fig. 4. Effect of NO$^•$ modulators on apoptosis induced by cisplatin treated for 48 h in HCT116 cells (p53+/+ and p53-/-). The results are shown as the mean ± SD (n=3). $^*p < 0.05$ versus control; $^#p < 0.05$ versus cisplatin.

Figure 4 shows that apoptosis (by FACS analysis after staining with FITC-conjugated Annexin-V and propidium iodide) induced by cisplatin alone or in combination with 1400W, Vinyl-L-NIO, gallotannin and c-PTIO in HCT116 (p53+/+ and p53-/-) cells. Approximately 37.9 and 36.8% of HCT116 (p53+/+ and p53-/-) cells (4- and 3.5-fold over control level), respectively, were apoptotic after cisplatin treatment and co-treatment with NO$^•$ modulators was more frequent than cisplatin alone ($p < 0.05$) (Figure 4). A stronger apoptotic response was induced in HCT116p53+/+ cells than in HCT116p53-/- cells (Figure 4).

Similar results were obtained in other cancer cell lines with different p53 status (Figure 5). By FACS analysis of cell DNA content, there was a remarkable accumulation of subploid cells, sub-G1 peak, in HCT116 (p53+/+ and p53-/-) cells after treatment with cisplatin alone or in combination with NO$^•$ modulators for 48 h when compared with the untreated group (Figure 5A). Since sub-G1 peaks include early and late apoptotic cells, but also a part of necrotic cells, such large sub-G1 fractions provide strong evidence for cytotoxicity induced by with cisplatin alone or in combination with NO$^•$ modulators resulting in the decrease of the number of viable cells. Furthermore, the stage at which growth inhibition induced by with cisplatin alone or in combination with NO$^•$ modulators occurs in the HCT116 (p53+/+ and p53-/-) cell cycle progression was determined, with cellular distribution in the different phases the treatment.

A

B

	Apoptotic cells (sub-G1)	Non-apoptotic cells		
		G0/G1	S	G2/M
HCT116 (p53+/+)				
Ctrl	8.3 ± 0.48	74.4 ± 1.10	9.4 ± 1.03	7.4 ± 0.49
Cisplatin	10.1 ± 0.11	74.0 ± 0.49	6.7 ± 0.16	8.7 ± 0.20
+ 1400W	11.3 ± 0.49	59.9 ± 1.23*	11.9 ± 2.28	16.2 ± 0.54*
+ Vinyl-L-NIO	22.2 ± 0.69*	16.8 ± 0.51*	18.6 ± 0.47*	42.0 ± 0.57*
+ Gallotannin	26.4 ± 1.47*	43.3 ± 1.40*	18.8 ± 0.67*	10.9 ± 0.61
+ c-PTIO	30.8 ± 1.24*	18.0 ± 1.49*	14.3 ± 0.54	35.7 ± 2.26*
HCT116 (p53-/-)				
Ctrl	9.5 ± 0.74	73.4 ± 0.01	8.8 ± 0.51	7.9 ± 0.08
Cisplatin	10.7 ± 1.65	72.4 ± 1.32*	7.7 ± 0.05	8.8 ± 0.48
+ 1400W	10.5 ± 0.25	62.4 ± 1.39	11.8 ± 0.89	14.7 ± 0.25*
+ Vinyl-L-NIO	24.5 ± 1.71*	23.4 ± 0.45*	14.6 ± 0.83*	36.9 ± 1.67*
+ Gallotannin	27.8 ± 1.00*	43.8 ± 2.69*	19.0 ± 0.79*	9.0 ± 0.99
+ c-PTIO	37.8 ± 1.44*	20.1 ± 1.30*	12.0 ± 0.16	28.9 ± 1.69*

Fig. 5. Effect of NO• modulators on cisplatin-induced cell cycle distribution in HCT116 cells (p53+/+ and p53-/-). (A) Cells were treated with cisplatin and/or NO• modulators for 48 h, stained with PI, and analyzed for sub-G1 and cell cycle using flow cytometry. Representative flow cytometry patterns are shown. (B) Cellular distribution (as percentage) in different phases of the cell cycle (sub-G1, G0/G1, S and G2/M) after treatment with cisplatin and/or NO• modulators is shown. Apoptotic nuclei were identified as a subploid DNA peak and distinguished from cell debris on the basis of forward light scatter and PI fluorescence. Results are presented as mean ± SD of three assays. *$p < 0.05$ versus control; #$p < 0.05$ versus cisplatin.

Figure 5B shows that co-exposure of cisplatin and NO• modulators resulted in a progressive and sustained accumulation of cells in the S and G2/M phases. Further, the percentage of S and G2/M phases cells increased, while those in the G1 phase decreased after co-treatment with A cisplatin and NO• modulators ($p < 0.05$), suggesting that they promotes cell growth inhibition by inducing S and G2/M phase arrests in colon cancer cells (Figure 5B).

X-linked inhibitor of apoptosis (X-IAP) is a potent endogenous inhibitor of apoptosis. It is expressed at relatively low levels in most normal cells, whereas in many cancers including colorectal cancer, it is generally over-expressed (Holcik et al.,

2001; Tong et al., 2005; Qiao et al., 2009). Down-regulation of XIAP leads to a sensitization of cancer cells to apoptosis (Inoue et al., 2004; Marienfeld et al., 2004; Qiao et al., 2009). To further confirm that endogenous NO• depletion enhanced cisplatin induced apoptosis in colon cancer cells, we carried out semi-quantitative RT-PCR of X-IAP. Cisplatin treatment resulted in a reduction in expression of X-IAP and it was less expressed when co-treated with NO• modulators in both HCT116p53+/+ cells and HCT116p53-/- cells (Figure 6). The expression of X-IAP in HCT116p53+/+ cells is much lower than in HCT116p53-/- cells (Figure 6B), suggesting the high expression of X-IAP in HCT116p53-/- cells may act as a contributing factor to cisplatin resistance by co-treatment with NO• modulators.
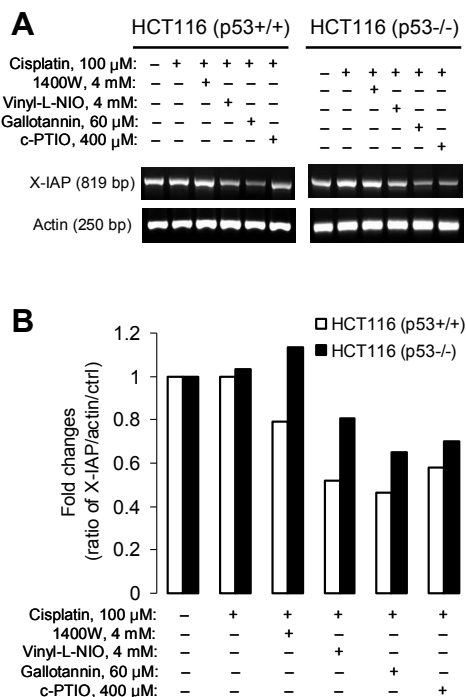
Fig. 6. RNA expression pattern of X-IAP after treatment with cisplatin and/or NO• modulators for 48 h. (A) Semi-quantitative PCR was performed using primer specific to X-IAP or a actin control on 1 μg total RNA prepared from cells treated with cisplatin and/or NO• modulators for 48 h. (B) Band intensities were calculated by densitometric analysis and normalized to actin levels.

Taken together, our results indicate that the depletion of endogenous NO• in melanoma cell lines leads to increased sensitivity to cisplatin, suggesting that NO• is required for p53 activation, which acts as a protective factor against apoptosis in colon cancer cells. Further research will be required to define more specifically the mechanisms through which they act.

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Effects of conduct to weeds and row spacing on weeds traits and agronomical parameters of rice (*Oryza sativa* L.) at the north of Iran

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Abstracts: In order to investigate effects of conduct to weeds and row spacing on weeds traits and agronomical parameters of rice (*Oryza sativa* L.) var. Tarom Mahalli, an experiment was carried out at split-plot in randomized complete block design with four replications at Sari region in 2010. Main factor was conduct to weed in two levels including (non weed control and with weed control) and sub factor was between row spacing in five levels including (10, 15, 20, 25 and 30 cm). Results showed lowest and highest of weeds number per m^2, weed height and weed dry weight were obtained at 10 cm and 30 cm between rows spacing, respectively. With control of weed increased of the plant height, panicle length, total tiller number per hill, fertile tiller number per hill, and panicle number per m^2, spikelet number per panicle, grain yield, and biological yield and due to harvest index. The most of panicle length, panicle number per m^2, spikelet number per panicle, fertile spikelet percent, grain yield, biological yield and harvest index were obtained in between row spacing of 15 cm and the least of panicle length, panicle number per m^2, fertile spikelet percent, grain yield, biological yield and harvest index were produced in between row spacing of 30 cm. The most of spikelet number per panicle and harvest index were produced at interaction of weed control × row space of 15 cm. Therefore, weed control treatment due to an increase of almost all the traits and the row space of 15 cm due to increased panicle length, panicle number per m^2, spikelet number per panicle, fertile spikelet percent, grain yield, biological yield and harvest index as the best studied factors introduced applied.

Introduction:

Early weeding isn't necessary because there is no competition between weeds and rice (Hall *et al.,* 1992). With progress of the growing season weeds make maximum damage to the plant (Wilson and Cole, 1966). All weeds remove before seedling transplanting, so there is no competition between weeds and rice in transplanting stage because there are few weeds and abundance of nutritional resources (Radosevich, 1987). In tillering time crop growth is impaired with increasing of weeds and despite its not significant decrease of yield but if weeds don't control it can significantly decrease yield (Rejmanek *et al.,* 1989). Weed interference with plant is important in tillering time and a good management Gives priority to weeding and weeds control (Van-Acker *et al.,* 1993). Rice yield strongly decrease with delay in weeds control 15 to 25 days after transplanting in rice field and decrease of rice yield are 30 to 40 % in transplanting seedling and 70 to 80 % in directly sowing because of weeds competition (Balasubramaniyam and Palaniappans, 2002). Estorninos *et al*. (2005) found that number of tiller decreased from 20 to 48 % with increase of weeds density from 25 to 51 plants per m^2. Nitrogen is important factor of growth limitation and lack of that caused decrease yield in each stage (Haefel *et al.,* 2006). Farmer grow the cultivars had high quality also, they had long height and sensitive to lodging and including 50% plant density area in Iran. Weather condition especially wind and rain in during full heading to ripening stages result in yield loss because increasing lodging and disease as a result decrease in grain yield. Baloch et al., (2002) found that the reason of rice grain yield enhancement under high plant density was due to the increase of the panicles per m². But at the same time the number of tillers and effective tiller in bush showed significant reduction. Therefore, with increasing of planting-density, in spite of the reduction of total number of tiller and effective tiller per bush, because of the increasing of the stem per square meter; consequently, number of panicle per m² and grain yield were increased. Also plant height in various genotypes of rice decreased by the increasing plant density (Mobasser et al., 2007). The purpose of this experiment was investigate effects of conduct to weeds and row spacing on weeds traits and agronomical parameters of rice (*Oryza sativa* L.) var. Tarom Mahalli at the north of Iran.

Materials and Method:

In order to investigate effects of conduct to weeds and row spacing on weeds traits and agronomical parameters of rice (*Oryza sativa* L.) var. Tarom Mahalli, an experiment was carried out at Sari city geographically situated at 36°, 37' N latitude and 53°, 11' E longitude at an altitude of 13.5 m above mean

sea level in 2010. The soils of fields were clay-loam. The results of soil analyses are shown in table 1 and

the weather condition in growth season is shown in table 2.

Table 1. Physical and chemical properties of soil before planting at Sari area in 2010.

Soil texture	K (ppm)	P (ppm)	N (%)	OM (%)	pH	EC (μmohs/cm)	Depth (cm)
Clay loam	185	22.8	0.50	2.2	7.1	0.24	0-30

Table 2. Weather conditions in rice growing period at Sari in 2010.

Variable	April	September	August	July	June	May
Minimum tem.	7.5	14	18.8	23.1	23.7	20.2
Maximum tem.	16.4	24	27.8	32.6	32.6	28.8
Minimum evaporation	60.4	55.6	56.5	49.6	54	58.2
Maximum evaporation	91.9	91.8	89.3	85.9	84.9	91.2
Precipitation	124.9	26.9	29.4	8.1	11.9	68.5

The experimental work was started in April 2010. Seeds of rice var. Tarom Mahalli were procured from Rice Research Institute, Amol, Mazandaran, Iran. This experiment was done as split plot in randomized complete blocks design based 3 replications. Weeds treatment was chosen as main factor (control and without control) and row spacing as sub-factor (10, 15, 20, 25 and 30 cm). The field was ploughed with tractor drawn disc plough followed by a through harrowing to break the clods. The field was properly levelled and 5×2 m size plots were earmarked with raised bunds all around to minimize the moment of watering and nitrogen. Channels were laid to facilitate irrigation to plots individually and each replication had 10 plots. 150 kg/ha Urea was supplemented as a source of urea to the main plant in three times (in time of transplantation, in time of initiative panicle, and in time of complete panicle). Also Phosphoric fertilizer in form of triple super-phosphate and potassium fertilizer in form of Sulphate-potassium was used about 110 and 100 kg/ha respectively. When rice seedlings were of 20 to 25 cm in height and 4 weeks old; they were uprooted and transplanted to experimental plots with treatment arrangement. Seedling transplanting and weeds control were done by design map. All operations like plant illnesses controlling and pests controlling were done during the growth process with chemical components. During the growth time, following characteristics was measured randomly from each plot. Plant height and stem length were measured from 12 hills in middle of each plot. Panicle length and flag leaf length were measured in the middle of each plot. Grain yield was harvested from 4 M² from the middle of the plot with 14 % humidity. Data

analyzed by MSTAT-C statistical software and Averages comparison were calculated by Duncan's multiple range tests in a 5% probability level.

Results:

Weeds were indentified in rice field, the most important and main weeds were barnyard grass (*Echinochloa crus-galli* L.) and Rice flat sedge (*Cyperus iria* L.) because those were higher and more than the others and occupied widely ecological nich. Barnyard grass is so important between rice weeds because of similarity in genetically, morphological and phenotype (Gibson *et al*., 2003). Also barnyard grass had C4 Photosynthetic pathway and more carbon exchanging capacity compare to rice (C3), so it had more efficient in water absorption and nitrogen (Alberto *et al.,* 1996). Weeds height had significant effect under row spacing in 1 % probability level (Table 3). Weeds height by 25 and 30 cm row spacing (62.53 and 61.33 cm) was the most and minimum weed height (10.1 cm) was observed in 10 cm treatment (Table 4). Weeds number per m^2 had significant effect under row spacing in 1 % probability level (Table 3). Maximum 49.25 plant per m^2) and minimum (9.25 plant per m^2) of weeds number were noted for 30 and 10 cm row spacing treatment, respectively and in 15, 20 and 25 cm was 22.45, 34.25 and 40.35 plants per m^2, respectively (Table 4). Weeds dry matter per m^2 had significant effect under row spacing in 1 % probability level (Table 3). Maximum weeds dry matter (193.7 g/m^2) was observed for 30 cm treatment and minimum of that (45.23 g/m^2) was for 10 cm row spacing (Table 4).

Table 3. Mean squares effects of weed traits in row spacing of rice.

S.O.V.	DF	Weed density	Weed height	Weed dry weight
Replication	3	32.574^{ns}	67.612^{**}	334.260^{**}
Treatment	4	875.943^{**}	2086.470^{**}	13262.418^{**}
Error	12	17.920	9.718	28.796
C.V. (%)	-	13.97	7.71	4.78

ns, *, ** = non significant, significant at 0.05 and 0.01 level of probability respectively.

Table 4. Mean comparison effects of weed traits in row spacing of rice.

Treatment	Weed density (plant per m^2)	Weed height (cm)	Weed dry weight ($g.m^2$)
Row spacing			
10 cm	9.25^d	10.10^d	45.23^e
15 cm	22.45^c	28.83^c	67.55^d
20 cm	34.25^b	46.33^b	122.00^c
25 cm	40.35^b	62.53^a	143.10^b
30 cm	49.25^a	61.33^a	193.70^a

*; means with similar letters in each column are not significant difference at the %5 level of probability according to DMRT.

Plant height had significant effect under weeds treatment in 5% probability level and row spacing in 1% probability level (Table 5). Plant height increased 2.53 % by weeds control and plant height was obtained (157.8 and 161.8 cm) for weeds without control treatment and control treatment respectively. Also plant height increased by increasing row spacing, so minimum plant height (140.3 cm) was observed for 10 cm and maximum of that (181.9 cm) was observed for 30 cm treatment (Table 6).

According to table 5, panicle length had significant effect under weeds treatment in 5% probability level and row spacing in 1% probability level (Table 5). Panicle length (26.2 and 30.7 cm) was for weeds without control treatment and weeds control treatment, respectively and panicle length increased 17.17 % by weeds control treatment. Minimum panicle length (21.4 cm) was observed for 30 cm row spacing and maximum of that (33.3 and 33.1 cm) was produced for 10 and 15 cm treatments (Table 6).

Tiller number per hill had significant effect under weeds treatment and row spacing in 1 % probability level (Table 5). Tiller number per hill (13.9 and 16.9 tiller) was for weeds without control treatment and weeds control treatment, respectively. Minimum tiller number (10.4 tillers) was observed for 10 cm row spacing and maximum of that (20.1 tillers) was obtained for 30 cm treatment (Table 6).

Fertile tiller number per hill had significant effect under weeds treatment and row spacing in 5 % probability level (Table 5). Fertile tiller number increased 41.1 % by weeds control treatment that they were 9 and 12.7 tillers for without weeds control and weeds control treatments, respectively. Also fertile tiller per hill increased by decreased plant density that the most fertile tiller equivalent to 13.8 tillers was observed for 30 cm row spacing and the

least fertile tiller number (7.7 tillers) was observed in 10 cm treatment (Table 6).

Panicle number per m^2 had significant effect under weeds treatment in 5% probability level and row spacing in 1% probability level (Table 5). Panicle number was 331 and 381 panicles for without weeds control and weeds control treatments, respectively. The maximum panicle number equivalent to 416.5 panicles was performed in 15 cm row spacing and minimum panicle number (294.8 panicles) produced for 30 cm treatment (Table 6).

Spikelet number per panicle had significant effect under weed control and interaction weeds × row spacing in 5 % probability level and row spacing treatment in 1 % probability level (Table 7). The most spikelet number was observed for 15 cm treatment (167.6 numbers) and minimum of that (122.3 numbers) was obtained in 10 cm treatment (Table 8). Maximum spikelet number (168.5 and 166.8 spikelets) was noted for interaction weeds control and non control with 15 cm row spacing and minimum of that (115.5 spikelet's) was for interaction weeds without control with 10 cm row spacing (Table 9).

Filled spikelet percentage had significant effect under row spacing in 1 % probability level (Table 5). Filled spikelet percentage was the most in 15 and 20 cm (96.4 and 94.4 %) and minimum of that (86.7 and 85.5 %) was performed for 10 and 30 cm treatment (Table 6).

1000 grain weight had significant effect under row spacing in 1 % probability level (Table 5). the most 1000 grain weight (26.9 g) was observed in 25 cm row spacing and minimum of that 20.7 g was obtained in 10 cm treatment in 15 and 20 cm (96.4 and 94.4 %) and minimum of that (86.7 and 85.5 %) was performed for 10 and 30 cm treatment (Table 6).

Table 5. Mean squares effects of conduct to weed and row spacing on agronomical traits of rice.

S.O.V.	DF	Plant height	Tiller number per hill	Fertile tiller per hill	Panicle number per m^2	Panicle length	Spikelet number per panicle	Filled spikelet percentage	1000 grain weight
Replication	3	199.37^{ns}	21.63^{**}	1.84^{ns}	11.83^{ns}	26.47^{ns}	105.29^{ns}	3.18^{ns}	1.64^{ns}
Weed (A)	1	155.24^{*}	87.03^{**}	132.50^{**}	24950.03^{*}	202.50^{*}	585.23^{*}	0.97^{ns}	0.03^{ns}
Error	3	32.87	0.03	2.79	48.76	6.97	22.96	5.84	0.76
Row spacing (B)	4	1984.65^{**}	114.81^{**}	46.91^{**}	19409.53^{**}	214.96^{**}	2259.98^{**}	180.07^{**}	53.61^{**}
AB	4	58.85^{ns}	1.81^{ns}	0.26^{ns}	208.03^{ns}	16.06^{ns}	73.98^{*}	12.29^{ns}	1.78^{ns}
Error	24	31.51	1.18	1.06	127.46	9.36	26.71	6.45	0.90
C.V. (%)	-	3.51	7.03	9.48	3.17	10.77	3.59	2.79	3.86

ns, *, ** = non significant, significant at 0.05 and 0.01 level of probability respectively.

Table 6. Mean comparison effects of conduct to weed and row spacing on agronomical traits of rice.

Treatment	Plant height (cm)	Tiller number per hill	Fertile tiller per hill	Panicle number per m^2	Panicle length (cm)	Spikelet number per panicle	Filled spikelet percentage	1000 grain weight(g)
Conduct to weeds								
Non control	157.8^{b}	13.9^{b}	9.0^{b}	331.0b	26.2^{b}	140.1^{b}	90.7^{a}	24.5^{a}
Control	161.8^{a}	16.9^{a}	12.7^{a}	381.0^{a}	30.7^{a}	147.8^{a}	91.0^{a}	24.6^{a}
Row spacing								
10 cm	140.3^{e}	10.4e	7.7^{e}	345.0^{c}	33.3^{a}	122.3^{d}	86.7^{c}	20.7^{d}
15 cm	151.1^{d}	13.1^{d}	9.4^{d}	416.5^{a}	33.1^{a}	167.6^{a}	96.4^{a}	23.2^{c}
20 cm	159.0^{c}	15.8^{c}	10.9^{c}	394.3^{b}	29.3^{b}	137.5^{c}	94.4^{a}	26.4^{ab}
25 cm	166.6^{b}	17.6^{b}	12.5^{b}	329.4^{d}	25.0^{c}	141.3^{c}	91.4^{b}	26.9^{a}
30 cm	181.9^{a}	20.1^{a}	13.8^{a}	294.8^{e}	21.4^{d}	151.0^{b}	85.5^{c}	25.6^{b}

*; means with similar letters in each column are not significant difference at the %5 level of probability according to DMRT.

Grain yield had significant effect under weeds treatment and row spacing in 1 % probability level (Table 7). Grain yield by weeds control treatment (568.5 g/m^2) increased 19.26 % because of panicle length, panicle number per m^2 and spikelet per panicle increase compare to weeds without control (476.7 g/m^2). Minimum grain yield (451.5 g/m^2) was noted for 30 cm row spacing because of reduce in panicle length and panicle number per m^2. Maximum grain yield (590.5 g/m^2) was produced for 15 cm treatment, because increased panicle length, panicle number and spikelet number per panicle (Table 8).

Biological yield had significant effect under weed control and row spacing in 5 % probability level interaction weeds × row spacing in 1 % probability level (Table 7). The most biological yield was observed for weed control (1366 g/m^2) and minimum of that was note in non weed control (1315 g/m^2). The most biological yield (1413 g/m^2) was produced in 15 cm treatment and minimum of that (1269 and 1227 g/m^2) was obtained in 25 and 30 cm treatment (Table 8). Maximum biological yield (1473 g/m^2) was noted for interaction weeds control and non control with 10 cm row spacing and minimum of that (1178 g/m^2) was observed for interaction weeds without control with 30 cm row spacing (Table 9).

Harvest index had significant effect under weed control and interaction weeds × row spacing in 5 % probability level and row spacing in 1 % probability level (Table 7). The maximum harvest index was observed for weed control (41.6 %) and minimum of that was note in non weed control (35.9 %). The most harvest index (41.9 %) was produced in 15 cm treatment and minimum of that (36.4 and 36.7 %) was obtained in 10 and 30 cm treatment (Table 8). The most harvest index (45.9 %) was noted for interaction weeds control with 15 cm row spacing and minimum of that (32.7 %) was observed for interaction weeds without control with 10 cm row spacing (Table 9).

Table 7. Mean squares effects of conduct to weed and row space on yield and harvest index of rice.

S.O.V.	DF	Grain yield	Biological yield	Harvest index
Replication	3	6728.025^{ns}	25770.233^{ns}	18.663^{ns}
Conduct to weed (A)	1	91872.225^{**}	25100.100^{*}	320.073^{*}
Error	3	2072.492	18283.567	11.586
Row spacing (B)	4	22467.538^{**}	68336.100^{*}	42.607^{**}
AB	4	1215.288^{ns}	4008.600^{**}	9.608^{*}
Error	24	1031.279	4111.650	2.986
C.V. (%)	-	6.17	4.78	4.46

ns, *, ** = non significant, significant at 0.05 and 0.01 level of probability respectively.

Table 8. Mean comparison effects of conduct to weed and row space on yield and harvest index of rice.

Treatment	Grain yield (g.m^2)	Biological yield (g.m^2)	Harvest index (%)
Conduct to weeds			
Non control	476.7^b	1315.9^b	35.9^b
Control	568.5^a	1366.0^a	41.6^a
Row spacing			
10 cm	526.6^b	1383.0^{ab}	36.4^c
15 cm	590.5^a	1413.0^a	41.9^a
20 cm	544.6^b	1353.0^b	40.2^{ab}
25 cm	489.6^c	1269.0^c	38.6^b
30 cm	451.5^d	1227.0^c	36.7^c

*; means with similar letters in each column are not significant difference at the %5 level of probability according to DMRT.

Table 9. Mean comparison interaction effects of conduct to weed and row space on agronomical traits of rice.

Interaction	Spikelet number per panicle	Biological yield (g.m^2)	Harvest index (%)
W_1D_1	115.5^f	1415^{ab}	32.7^f
W_1D_2	168.5^a	1425^{ab}	37.9^{cd}
W_1D_3	133.0^{de}	1323^{bcd}	37.2^{de}
W_1D_4	138.5^{cd}	1240^{de}	37.0^{de}
W_1D_5	145.0^c	1178^e	35.0^{ef}
W_2D_1	129.0^e	1473^a	40.2^c
W_2D_2	166.8^a	1401^{ab}	45.9^a
W_2D_3	142.0^c	1383^{abc}	43.2^b
W_2D_4	144.0^c	1299^{cd}	40.2^c
W_2D_5	157.0^b	1276^{de}	38.5^{cd}

*; means with similar letters in each column are not significant difference at the %5 level of probability according to DMRT.

Discussion:

Weeds had the most damage in crops when it reached to sources limitation time (Wilson and Cole, 1996). Natural process of rice growth was disturbed by increase of weeds seed germination and occupied within the row space (Rejmanek *et al.,* 1989). There is no competition between rice and weeds in early growth stage and weeding is not necessary (Hall *et al*., 1992). Islam *et al*. (2003) have seen plant height was 76.5 cm when there was no competition between rice and weeds but in 112 plants per m^2 barnyard grass decreased 42.9 % plant height and this results were supported by Holm *et al.* (1997). Asghari (2002) stated that plant height increased by weeds control and less nutritional competition. Sadati and Fallah (1995) stated that plant height had significant different in tillering time by nitrogen contributing in 1 % probability level.

Panicle length (17.21 %) increased by weeds control (Malek *et al.,* 2011). Panicle length in transplanting rice and direct sowing rice effects in grain yield by more transfer of photosynthetic material (Dobermann *et al*., 2002). Malek *et al.* (2011) stated that flag leaf length increased by weeds control compare to weeds without control. Mohammadi *et al*. (2011) found flag leaf length increased by weeds control and nitrogen application. Rice grain yield decreased with barnyard grass competition because it reduced fertile tiller number, spikelet number per panicle and 1000-seed weight (Holm *et al.,* 1977). Grain yield decreased 25 % by weeds competition (Lindquist and Kropff, 1996). Reduce of dry matter gathering was for competition between rice and weeds for nutrition sources and light (Aminpanah *et al*., 2007). Researchers reported reduce of dry matter gathering by competition conditions

(Heafele *et al*., 2004; Holm *et al.,* 1977 and Zhao *et al.,* 2006). Grain yield strongly decreased by delay in weeds control in rice filed and reduce of grain yield was 30 to 40 % for transplanting rice and 70 to 80 % in seedling direct planting (Balasubramaniyam and Palaniappans, 2002). According to the research results, as the total number of tiller and effective tiller per bush reduces by plant density deduction, but the number of panicle per m² has had a significantly increasing. Also, length of panicle and flag leaf by increasing of plant density had deduction, but the total number of spikelet, hollow spikelet per panicle, weight of 1000-seed and straw yield under the plant density effects have not shown significant differences (Yadi et al., 2012).

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The Role of Myostatin on Growth and Carcass Traits and its Application in Animal Breeding

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Abstract: Myostatin or growth and differentiation factor 8 (GDF8), is a regulator factor that determines muscle mass. Mutation in the myostatin sequence controls its regulating function and results in growth and hypertrophy of muscles. Mutation in myostatin has been found in various species and this gene has three exons and two introns in all spices. Muscular hypertrophy is found in Belgians-Blue cattle, and animals with mutant allele produce more meat. Mutant allele with the growth rate and desired carcass traits are significant correlated and increase ratio the muscle to fat and bone.Various SNPs in myostatin have been found which have an important association with carcass. SNP $g + 6223$ G>A used as an effective marker in Texel sheep. Severe selection of mutated allele in European breeds has caused these allele become fixed in the population. Whereas, in Iranian breeds frequency of this allele is very low and its reason comes back to the genetic background and selection programs.
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1. Introduction

Still produce meat are most important animal production. Not only quality but quantity is important in meat industry as well. Food and physiological research demonstrated even meat macro molecular components have a great influence on quality. Scientists in the past decade many techniques for identifying and determining the origin of species, especially in meat products are identified that is very important in respect to economic, religious and health (Ghovvati et al., 2009).

Advances in molecular genetics caused identification many genetic markers, these markers help to identify quantitative trait loci (QTL) related to economical traits. If polymorphisms created in marker affects on gene function or have a linkage with QTL, the marker shows the maximum efficiency. Genome scans in economic animal show QTLs that are effective on growth and carcass traits. Wide studies have been conducted in the sequence of genes associated with economic traits. Polymorphisms that are associated with the function of these genes have been observed in different species.

Myostatin is an effective gene for growth and function as an inhibitor factor on muscles growth (Figure 1). Different polymorphisms have been identified in the sequence of this gene that has a significant association with growth and carcass traits. These polymorphisms are used as efficient marker in beef cattle in order to increase quality and quantity of meat.

Muscular hypotrophy was observed in a few cattle breeds and it's due to the mutation of myostatin. Mutation has been fixed in these breeds and it's transmitted from one generation to another. These animals have a big and bulky body and this phonotype is recognizable easily so, they are the source of meat production.

The beef cattle of Belgian-blue are homozygote for these mutations. Because the aim of breeding of this breed is selecting and reproduction animals with muscle hypertrophy (Figure 2) (McPherron and Lee, 1997).

Identification of effective QTL on double-muscled in different species

The genetic cause of muscular hypertrophy was unknown for a long time. When the changes of myostatin gene were discovered on mouse, QTL related with double muscled animals was identifying (McPherron et al., 1997). When was discovered genetic cause of double muscled was cleared that this trait is probably autosomal, partially recessive and incomplete penetrance (McPherron et al., 1997).

After that wide researches began on different cattle breeds and using FISH method determined that this gene is located in the q arm of chromosome 2 close to the centromere region and its locus was named *mh* (Smith et l., 1997). Then by the use of molecular methods was characterized an 11-bp deletion mutation within 3 exon of myostatin in Belgian Blues breed. This mutation is considered as marker for double muscling, so different genotypes of *mh* locus in cattle can apply for genetic selection (Bellinge et al., 2005).

Early studies show that, there is an effective QTL for fatness and muscle size on chromosome 2 of sheep. Identify of Mutation in this QTL was a new

start in breeding of carcass traits (Walling et al., 2004).

In Texel sheep, identify a selective sweep at myostatin that located on chromosome 2 was used for mapping QTL effective for increase muscle mass. In this survey mutation of G→.A in nucleotide 1232, after a stop codon was identified and it causes muscular phenotype. (Clop et al., 2006).

Physiological comparison of normal animals and double muscling (DM)

Earliest studies on double-muscling animals indicated that mouse with compact phonotype and double-muscling have internal organs like: heart, kidney and intestine bigger than normal animal (Buenger et al., 2004).

Animals with double muscle phenotype have the increase in the diameter of the muscle filaments and increased number of filaments (hypertrophy and hyperplasia). But this increase is not exactly twice that of normal animals. Also, these animals are having less collagen. Reported that the connective tissue of these animals are less than the normal animals (Kobolak and Gocza, 2002). In addition, survey of circulating hormones has been found that higher growth hormone levels were found in DM cattle compared with normal animals. A similar result was found for insulin, creatine and creatine and muscle IGF2 mRNA concentration. Level these hormones with normal animals higher than DM cattle (Gerrard et al., 1991).

The amount of fat in the carcass of DM cattle is significantly less than normal cattle, especially intramuscular fat (marbling) is significantly influenced by DM phonotype because reduced subcutaneous and internal fat tissues. Study the carcass of Belgian blues shows that fat compounds is quite different with other normal breeds.

When the whole content of lipid and percentage of unsaturated fat acids in the DM intramuscular fat content, was analyzed, its amount in comparison with normal animals was lower and much higher respectively. Also in comparison with normal animal was observed the high proportion of polar fatty acids and linoleic acids in Belgian blues (Smet et al., 2000). Animals with this phenotype besides increase production were better in feeding efficiency rather than their normal counterpart (Aenold et al., 2001).

Evaluation of mutation in myostatin and its role on regulation of muscles growth

Gene sequencing myostatin has been occurred in different species like cattle, sheep, chicken, goat and pig and in all of these species, this gene has three exons and two introns. There have been reports of nine mutations in coding regions of GDF-8 that cause various changes, of which three cause missense mutations, including two in exon 1 and one in exon 2. The six mutations, located in exons 2 and 3, result in premature stop codons, each of these mutations causes the negative effect of myostatin to stop the muscles growth and create double muscling phonotype (Belling et al., 2005).

Myostatin gene in bovine is located at the end of chromosome 2 and many mutations that cause appearance MM genotype and DM phonotype have been identified in this gene sequence. Mutations identified in cattle myostatin sequence are more than other species. (Riquetl et al., 1997)

sequencing GDF-8 gene in Belgian Blue breeds showed mutation which resulted in 11-bp deletion in coding region of myostatin cause stop decoding after amino acid 287 and it cause forming an inactive and incomplete protein so it stops the controlling role of myostatin protein on muscles growth then it appears DM phenotype. Mutation exon 3 in piedmontes breed changes nucleotide G into A and cysteine amino acid codon changes into tyrosine and probably inhibited myostatin gene function (McPherron and Lee, 1997).

In sheep, the myostatin gene is located on chromosome 2. For the first time muscular hypertrophy was found in Belgian Texel breed twenty single-nucleotide polymorphisms (SNPs) were identified in the region of GDF-8 in Texel sheep. Among There are, SNP g+6223G>A in the 3' untranslated region (3'UTR) that cause the body muscular (Clop et al., 2006). This SNP has been found in other breeds like Australian .New Zealand, Suffolk, Lincoln and Dorset horne, so g+6223G>A is used as an useful marker in crossing for improvement the sheep carcass traits (James et al., 2007).There is a significant association of g+6223.A allele with birth weight. A study done on Romney sheep in new Zealand showed average birth weight of sheep with g+6223 GG genotype is 5/8 kg whereas average birth weight of lambs with g+6223AG is 6/2 kg (Han et al., 2010)

Not only expression of myostatin gene is for skeletal muscles but there is mRNA in non-skeletal. Tissues like brain, heart muscle, purkinje fiber of the heart, mammary gland and some of white muscles. However the function of this mRNA has been remained unknown (ocamis et al., 2001).

Findings of study on muscular cells in chicken are quite different with others species and there is no significant difference between the level of mRNA myostatin in slow and fast muscles of chicken. In addition definite level of myostatin remains fixed during myoblast proliferation. The content of mRNA satellite cells differs with mature cells (Kobolak and Gocza, 2002).

Many mutation has been not observed at chicken myostatin gen. Studies conducted in breeds of chickens, have shown different mutations in the gene myostatin that cleared association of the myostatin gene with fat metabolism and body weight traits (Zhang et al., 2011)

In fish, amino acid sequence among different breeds show a high homology but and they differ from those of the higher vertebrates. In fish myostatin expression belongs not only to skeletal muscles but it has been in other tissues too, in brain, myostatin is expressed in optic lobe, cerebellum and hypothalamus. The ovarian form of the myostatin shows an increase in ovulating in fish different breed and it is expressed in red muscle of some breeds, these findings show that myostatin, in fish has a different role in comparison with higher vertebrates (Roberts and Goetz, 2001)

Studies have determined that depending on muscle type myostatin expression varies in different species. In rat myostatin protein level is high in fast muscles fibers than slow muscles (Sakuma et al., 2005). But mRNA and protein level in mouse is quite apposite of this fact (Carlson et al., 1999). Whereas mRNA and protein level in human muscular fibers are the same (Wehling et al., 2000).

Myostatin Role in meat production

In the meat industry, two traits, carcass quality and quantity of the most important factor affecting profit. These traits affect important factors such as genetics, nutrition, climate and so on. And is currently much research being done to predict carcass traits. Among the factors that determine the meat quality, genetic factor has a dominant role on meat quality (Kioumarsi et al., 2008).

Trend growing demand for lean meat with low levels of fat, which conformable with health standards scale, Results development of breeding programs and genetic improvement of commercial animals with higher production in last decades.

At recent years, there has been a wonderful progress on quantities and molecular genetics through mapping of the commercial animal's genome and new opportunities have been provided for increase meat production and market for requirement consumers (Dekkers and Hospital, 2002). Different QLTs have been known that influence on muscles growth and carcass trait. At the present time few mutations in these QTLs have been identified and survey. The mutation in myostatin reported that has been associate with increase body weight and carcass trait in several species (Masri et al., 2011).

Mutated allele and inactive myostatin have a significant association with growth speed and carcass favorite traits. This allele causes increase muscles and low fat carcass. Farmers who raise calf carrying

mutated allele of myostatin gain benefit more by production and market of meat (Casas et al., 2004).

Mutation in myostatin has an important effect on carcass quality and decreases amount of fatness in carcass .studies on south Devon cattle show that for each mutated allele there was 14.1 kg weight gain in animals carrying this allele compared with other animals (Wiener et al., 2009).

In animals with hypertrophy phonotype, fat amount cuts down into 50 percent and muscle mass increases 20 percent. Also connective tissues decrease in these animals so delicate and delicious meat is produced. It makes improves value of consumption a lot (McPherron et al., 1997).

Studies on Texel Dourest sheep shown that is a significant difference in carcass components between carriers of mutated allele with other animals. In animals with MM genotype traits such as live weight, carcass weight, muscle weight and its proportion to bone is significantly higher than normal animals and the amount of carcass fatness in animals carrying mutant allele is significantly lower than normal animals (Masri et al., 2011)

Other candidate genes effective on meat production

There are a lot of genes that influence on growth traits and carcass quality and can be as candidate genes for traits listed above or have be a close linkage with genes controlling these traits. Calpastatin, leptin, growth hormone, prolactin, IGF and PIT are main genes that directly or with the effect on other hormones effect on meat quality and quantity (Saxena et al., 2009).

Based on studies about effective genes on meat production and association their polymorphism with, meat quality and quantative they are used as genetic markers in breeding plans for increase precise and selection-responsive.

Polymorphism myostatin genes in Iranian sheep

Survey diversity in local breeds very important for its survival because loss of genetic diversity in a breed cause increase in the rate of inbreeding and genetic abnormalities, thereby reduce animal performance, especially the reproductive traits (Mirhoseini et al., 2005).

Studies done on Iranian sheep show that polymorphism has not been observed for this gene; whereas European sheep have a high polymorphism of this gene. In Texel breed mutated allele of this gene has been fixed.

Study on karakul breed indicates that in 3exone of myostatin gene for wild allele are monomorphic (Zare, 2012). Study done in two breeds of Zell and Makoie were shown that the all of the animal are monomorphic and the mutant allele of the myostatin not found (Moradi, 2009). In another study

done on Sanjabi breed less than three percent of samples had efficient allele in this gene and a low level of polymorphism was observed in this locus (Soufy et al., 2009).
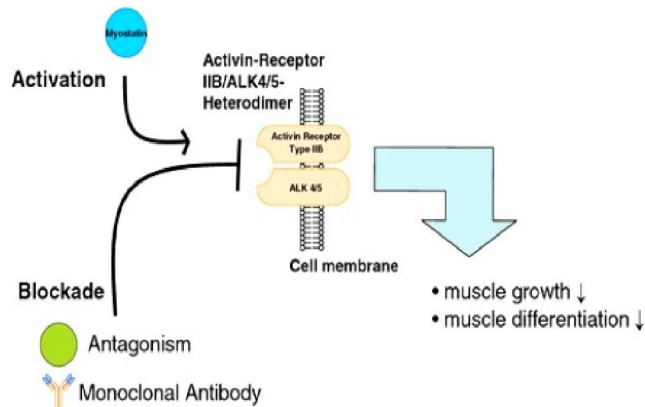

Figure 1. Myostatin pathway: myostatin levels regulate skeletal muscle cell

Figure 2. Belgian Blue cattle are "naturally" myostatin negative

In untranslatable region 3(3UTR), myostatin gene SNP 6223G→A has been known that increases muscle mass. In a study about three sheep breeds Zel, Chall and Zandi, this SNP has not been observed (Miar et al., 2009).

The magnitude and even the mode of action of the myostatin mutational effects on phenotype are probably affected by the genetic background of the breed in which the mutation is seen (Hahjipavlou et al., 2008).

Difference of myostatin polymorphism incidences between Iranian and European breeds comes back to selection plans for efficient allele of this gene. In European breeds the high improved selection of this allele has increased frequence of allele in commercial breeds and it has become fixed.

Restrictions myostatin gene in animal breeding

Myostatine gene is considered as the important locus in production traits. Several mutations on this gene cause double muscled phonotype and lead to massive muscle mass that one of the goal, raising the commercial animals. Select double muscled animals provide some problems such as dystocia. Animals with phenotype homozygote DM are affected more problems of dystocia rather than other animals even heterozygote type. Heterozygote animals with mutated allele somewhat have less danger of dystocia and they can produce homozygote calves for this allele so it is a simple solution to reduction of the costs and calves death probability. Double muscled phonotype lead to some other problems such as reduction fertility and increase of getting stressed and metabolically acidosis (Bellinge et al., 2005).

Conclusions

Identified mutations in sequences myostatin using molecular techniques is an effective solution for survey double muscle phenotype and help the breeders to get important information in order to make the precise decision for management and selecting the best population for reproduction and it lets the breeders have a lot of data about genetic status of myostatin gene in animals. Select right genotype with mutated allele is highly useful in crossed with beef breeds that produce fat and it causes protein and dry matter meat unchangeable. In order to determine genotype of myostatin and use of special programs for mating help to solve problems created by this gene application in breeding.

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An exploratory study of entrepreneurial attributes among Malaysian university students

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Abstract: Entrepreneurial attributes motivate and enable individuals to enter into the challenging process of creating new ventures. A tremendous amount of research has been devoted to identifying these attributes and evaluating the impact of education and training programs on developing such attributes, particularly among university students. However, few researchers have examined a combination of students' entrepreneurial characteristics that can be developed through education and training. This study aims to determine a set of entrepreneurial attributes, including self-regulation, self-efficacy and intention, among Malaysian university students. A total of 722 students were randomly selected as participants. Our results indicated that these students have a moderate level of self-regulation and entrepreneurial self-efficacy but a high intention to become an entrepreneur. Furthermore, students are more prevention than promotion focused. We discuss the implications of these findings for entrepreneurship research, theory development and education.

1. Introduction

Entrepreneurial attributes are characteristics that motivate and enable individuals to begin the challenging process of creating new ventures (Gürol and Atsan, 2006; Kuratko, 2005; Mueller and Thomas, 2000). These personal traits highly influence entrepreneurs' performance and success at different stages of the entrepreneurship process (Hmieleski and Baron, 2008; Brockner et al., 2004; Markman and Baron, 2003). Particularly, prospective entrepreneurs rely on these motivating attributes to explore new business opportunities; this is the first step in creating a new business (Trevelyan, 2011). A tremendous amount of research has sought to identify entrepreneurial attributes, particularly among university students (Wu and Wu, 2008; Wilson et al., 2007; DePillis and Reardon, 2007; Fayolle et al., 2006; Segal et al., 2005; Zhao et al., 2005; Shane et al., 2003; Chen et al., 1998). While some researchers have focused on specifying inborn entrepreneurial traits, such as "locus of control", "need for achievement" and "tolerance for ambiguity" (Hansemark, 1998; Teoh and Foo, 1997; McClelland, 1961), others examined longer lasting entrepreneurial qualities that have a great impact on entrepreneurial behaviors and can be acquired and developed through education and training (Bryant, 2006; Krueger et al., 2000, Mueller and Thomas, 2000; Chen et al., 1998; Ajzen, 1991).

Currently, the entrepreneurial attributes that can be taught to students, and enable them to successfully establish new ventures is a hotly debated area (Wilson et al., 2007; Klein and Bullock, 2006; Henry et al., 2005). This affects the preparation of effective entrepreneurship education programs that can develop students' entrepreneurial capabilities and improve their success in creating new ventures, particularly in developing countries such as Malaysia (Cheng et al., 2009; Mastura and Abdul Rashid, 2008). This exploratory study attempts to resolve some of these issues by examining a set of entrepreneurial attributes that can be improved among university students by education and training. We offer one of the first empirical studies that explores and integrates self-regulatory focus, recently used to explain entrepreneurial motivation and behavior (Tumasjan and Braun, in press; Bryant, 2009, 2007; McMullen and Shepherd, 2002), and entrepreneurial self-efficacy and intention that have been used to evaluate the students' desire and ability to become an entrepreneur (e.g., Wilson et al., 2007; DePillis and Reardon, 2007; Fayolle et al., 2006; Segal et al., 2005; Zhao et al., 2005; Shane et al., 2003; Chen et al., 1998). We first describe the theoretical foundations of the constructs under this investigation and their influence on entrepreneurial behavior. Then, after we present our research methods and results, we conclude with a discussion of the findings in light of their implications for entrepreneurship research, theory development and education.

2. Self-regulation and entrepreneurship

The theory of self-regulation (Higgins, 1998) is based on the belief that people tend to seek joy and comfort and avoid distress and conflict. However, this

can also be modified by one's self-regulatory focus; which is the ability to set and achieve goals despite the presence of personal and environmental obstacles (Higgins et al., 2001). Promotion and prevention focuses are two driving forces that can direct people's motivation towards the accomplishment of their goals. When promotion-focused, people consider the pleasant and gainful outcomes of achieving their goals. When prevention-focused, however, they emphasize their security and avoid potential failures and losses (Bryant, 2007; Brockner et al., 2004; McMullen and Shepherd, 2002). An individual's sense of self-regulation is shaped by a combination of their past successes and failures as well as present environmental factors (Higgins et al., 2001). Since everyone's experiences are unique, their self-regulatory orientation will differ in terms of their motivation and ability to set personal goals. Further, their cognitive ability to determine the outcomes of these goals, as well as the means and strategies to achieve them, will also be subject to their sense of self-regulation (Trevelyan, 2011; Bryant, 2009, 2007; Brockner et al., 2004; McMullen and Shepherd, 2002). The theory of self-regulation has recently been applied in entrepreneurship research to explain the levels and patterns of individuals' entrepreneurial attributes (Brockner et al., 2004). When faced with highly complex and risky situations, such as those found in entrepreneurial activities, self-regulatory focus can help define the manner by which individuals approach these situations and direct themselves to fulfill required tasks. Self-regulation, therefore, plays a critical role in one's selection as an entrepreneur (Bryant, 2006). It also affects the amount of effort entrepreneurs put into establishing new ventures as well as their entrepreneurial success (Brockner et al., 2004). Promotion focus motivates entrepreneurs to explore various creative and innovative entrepreneurial opportunities (Tumasjan and Braun, in press; Trevelyan, 2011; Brockner et al., 2004), decide which entrepreneurial opportunities to exploit (Bryant, 2007) and improve the performance of their new venture (Hmieleski and Baron, 2008). In contrast, prevention focus directs entrepreneurs away from risky and uncertain tasks such as entering a new industry or market (Trevelyan, 2011). Brockner et al. (2004) have emphasized that entrepreneurs need to be competent in shifting from one focus to the other in order to successfully perform their tasks in and across different stages of the entrepreneurship process. Scholars strongly believe that systematic and purposeful interventions, such as education and training, can improve self-regulation and thereby the students' desire and competence to become an entrepreneur (Tumasjan and Braun, in press; Bryant, 2006, 2007; Brockner et al., 2004). However, there is

little empirical research published related to students' self-regulation focus and their intention to become an entrepreneur (McMullen and Shepherd, 2002).

3. Self-efficacy and entrepreneurship

While self-regulatory focus has recently emerged as a theoretical framework in entrepreneurship research and education, (Tumasjan and Braun, in press; Bryant, 2006, 2007; Brockner et al., 2004; McMullen and Shepherd, 2002), self-efficacy has traditionally been used to explain entrepreneurs' motivation and performance as well as students' entrepreneurial intention and behavior (Tyszka et al., 2011; DePillis and Reardon, 2007; Segal et al., 2005; DeNoble et al., 1999; Chen et al., 1998). Grounded in social cognitive theory (Bandura, 1997), self-efficacy is the personal cognitive evaluation of one's ability to successfully perform a specific task. This personal assessment of task performance success is affected by various personal, behavioral and environmental factors. These environmental factors highly influence one's perceived capabilities when acquiring a new sense of self-efficacy or changing acquired skills to successfully complete a novel task (Bandura, 2012). Entrepreneurial self-efficacy, therefore, is "the belief in one's efficacy in performing entrepreneurial tasks" (Bryant, 2007:735). Entrepreneurial self-efficacy has been highlighted as one of the key personal traits that motivates entrepreneurial behaviors (Tyszka et al., 2011; McGee et al., 2009; DePillis and Reardon, 2007; Chen et al., 1998) and enhances individual's motivation and competence when beginning new ventures (Boyd and Vozikis, 1994). It also enables entrepreneurs to cope with uncertainties and challenges during the entrepreneurship process from opportunity recognition to mobilizing resources and improving performance and success of the new business (Tumasjan and Braun, in press; McGee et al., 2009; Barbosa et al., 2007; Bryant, 2006; Markman and Baron, 2003).

The fundamental role that entrepreneurial self-efficacy plays in the process of entrepreneurship has led educators to provide opportunities for students to improve their self-efficacy in different tasks and roles as an entrepreneur (Baum and Locke, 2004; Rae and Carswell, 2000). Students' involvement in various learning experiences such as business plan writing, running a small business and working with an entrepreneur, help them evaluate their capabilities to perform these tasks and decide on whether to pursue an entrepreneurial career path (Wilson et al., 2007; Fayolle et al., 2006; Zhao et al., 2005; Erikson, 2003).

However, few researchers have measured the different dimensions of entrepreneurial self-efficacy (McGee et al., 2009; Barbosa et al., 2007), particularly in relation to other entrepreneurial attributes such as self-regulatory focus (Tumasjan and Braun, in press;

Tyszka et al., 2011; Bryant, 2007, 2006). Most studies in educational settings have examined the relationship between students' entrepreneurial self-efficacy and intention to become an entrepreneur (Kickul et al., 2009; Wilson et al., 2007; Fayolle et al., 2006; Zhao et al., 2005). While researchers such as Bandura (1997) have emphasized that self-efficacy affects one's behavior through self-regulatory processes such as motivation, perseverance and confidence in accomplishing a task. Therefore, self-efficacy can influence an individual's behavior both directly and indirectly through self-regulatory mechanisms (Bandura, 2012). Bryant (2007, 2006) highlights the urgent need to integrate these constructs to better understand entrepreneurial behavior. Tumasjan and Braun (in press) have provided empirical evidence for the complementary impact of entrepreneurial self-efficacy and self-regulatory focus on entrepreneurial behaviors such as opportunity recognition. However, few studies have used both of these constructs in educational settings to examine students' entrepreneurial intention and behavior (McMullen and Shepherd, 2002). This limited understanding affects the provision of effective educational programs and pedagogical methods based on students' entrepreneurial strengths and weaknesses, which is important in the development of their entrepreneurial intention and competence (Chen et al., 1998). To this end, this study aims to measure the dimensions of entrepreneurial self-efficacy and self-regulatory focus among university students.

Entrepreneurial intention, self-regulation and self-efficacy

The decision to choose entrepreneurship as a career path has been one of the main focuses of entrepreneurship researchers and educators. Researchers have predominantly used the theory of planned behavior (Ajzen, 1991) to explain one's career choice as an entrepreneur based on the assumption that this choice is a conscious and deliberate behavior that can most accurately be predicted by intention (Guerrero et al., 2008; Souitaris et al., 2007; Segal et al., 2005; Ajzen, 2002; Krueger et al., 2000; Boyd and Vozikis, 1994). This theory considers human decision to adopt a behavior, such as creating a new venture, as a function of the interactions between three motivational and enabling factors. These factors include control over behavior (individual perceptions of their abilities to perform entrepreneurial tasks), attitude towards a behavior (individual awareness of the importance and value of entrepreneurship) and subjective and social norms (individual perception of the significance of how others value and support the establishment of a new business). Meek et al. (2010) further conclude that social norms, defined as the widely accepted rules by

groups of people, influence the intention to establish a new venture.

Education and training programs can improve entrepreneurial intentions. Several studies have demonstrated that entrepreneurial education significantly influences students' intention to start their own businesses (Wu and Wu, 2008; Fayolle et al., 2006; Peterman and Kennedy, 2003). These programs nurture students' intention to become entrepreneurs through developing their entrepreneurial skills, highlighting the merits and benefits of entrepreneurship for personal and social developments and giving them experience of managing a small simulated business (Souitaris et al., 2007; Fayolle et al., 2006; Segal et al., 2005; Ajzen, 2002; Krueger et al., 2000).

Furthermore, entrepreneurship education improves students' entrepreneurial intentions by enhancing their self-efficacy (Souitaris et al., 2007; Fayolle et al., 2006; Zhao et al., 2005). Although the association between students' entrepreneurial intention and self-efficacy has been well established (Tumasjan and Braun, in press; Culbertson et al., 2011; Kickul et al., 2009; Souitaris et al., 2007; Fayolle et al., 2006; Zhao et al., 2005; Krueger et al., 2000; Chen et al., 1998), little is known about the impact of students' self-regulatory focus on their intention to launch a new venture (McMullen and Shepherd, 2002). Although previous research has shown the influential role of self-regulation in a student's decision to become an entrepreneur (Bryant, 2007), the role that self-regulatory focus plays in this decision making process has been largely overlooked. This study aims to address this issue by measuring university students' self-regulatory focus, entrepreneurial self- efficacy and intention.

Methods

We used a descriptive research design to determine the level and pattern of self-regulatory focus, entrepreneurial self-efficacy and intention among university students. Data were collected via a questionnaire consisting of 25 items having four subsections. The first section included the students' demographic information such as age, gender, level and field of study and nationality. The second section of the questionnaire measured both dimensions of the students' self-regulation, promotion and prevention focus (11 items), based on the Regulatory Focus questionnaire developed by Grant and Higgins (2003). Students' entrepreneurial self-efficacy was measured by 5 items using the Self-efficacy Skills questionnaire (Scherer et al., 1989). Finally, we assessed students' entrepreneurial intention, by asking if they would like to become an entrepreneur and their desire to learn entrepreneurship by asking if they need to learn entrepreneurship. The participants were also asked to

respond on a 5 point Likert scale, ranging from 1 "strongly disagree" to 5 "strongly agree". A total of 722 students were randomly selected from both public and private universities in Malaysia based on the rationale that situational factors highly affect individuals' sense of self-regulation and self-efficacy (Higgins et al., 2001; Bandura, 1997). The majority of the students were between 16 to 25 (76.9%) years old. Of the 722 participants, 377 (52.2%) were male and 342 (47.4%) were female. Most of the students were pursuing their Bachelor degrees (541, 74.9%). The students had different educational backgrounds: agricultural science (104, 14.4%), information technology (82, 11.4%), accounting and finance (41,

5.7%), and others (495, 68.5%). Majority of the students had no business experiences (491, 68%) and had never taken an entrepreneurship course (363, 50.3%). Of the students, 391 (54.2%) were from private universities and 331 (45.8%) were from public universities.

4. Findings

Data analysis revealed that most students intended to become an entrepreneur (*n*= 510, 70.6%). The majority of the students also wanted to learn entrepreneurship (*n*=622, 86.1%). Furthermore, they scored moderate in both dimensions of self-regulatory focus as illustrated in Table 1 and 2. However, they are more prevention focused than promotion focused.

Table 1: Students' promotion focus

Items on promotion focus	Mean	SD	Level
1. Compared to most people, are you typically unable to get what you want out of life?	2.84	1.10	Moderate
2. Do you often do well at different things you try?	3.50	.82	Moderate
3. Growing up, would you ever "cross the line" by doing things that your parents would not tolerate?	3.17	1.09	Moderate
4. How often did you obey the rules and regulations that were established by your parents?	3.37	.94	Moderate
5. Growing up, did you ever act in ways that your parents thought were objectionable?	3.25	.93	Moderate
6. Not being careful enough has gotten me into trouble at times.	3.32	1.02	Moderate

Note: interpretation of mean scores (1-2.33) low, (2.34-3.67) moderate, (3.68-5) high.

Table 2: Students' prevention focus

Items on prevention focus	Mean	SD	Level
1. How often have you accomplished things that got you "psyched" to work even harder?	3.41	.81	Moderate
2. When it comes to achieving things that are important to me, I find that I don't perform as well I ideally would like to do.	3.07	.97	Moderate
3. I feel that I have made progress toward being successful in my life.	3.54	.90	Moderate
4. I have found very few hobbies or activities in my life that capture my interest or motivate me to put effort into them.	3.45	1.07	Moderate
5. Did you ever get on your parents' nerves often when you were growing up?	3.29	1.02	Moderate

Note: interpretation of mean scores (1-2.33) low, (2.34-3.67) moderate, (3.68-5) high.

Additionally, the students had a moderate self-efficacy in all entrepreneurial tasks including marketing, accounting, organizing, human resource management and production management (Table 3).

Table 3: Students' entrepreneurial self-efficacy

Items on entrepreneurial self-efficacy	Mean	SD	Level
1. I can successfully complete the necessary marketing tasks related to owing a business (consider selling, selecting and customer service).	3.37	.94	Moderate
2. I can successfully complete the necessary accounting tasks related to owing a business (consider obtaining financial resources, book keeping, monitoring accounts and budgeting).	3.16	.97	Moderate
3. I can successfully complete the necessary personnel tasks related to owing a business (consider employee selection, discipline, motivation and job analysis).	3.47	.88	Moderate
4. I can successfully complete the necessary production tasks related to owing a business (consider inventory, quality control, manufacturing and layout of facilities).	3.32	.89	Moderate
5. I can successfully complete the necessary organizational tasks related to owing a business (consider planning, coordinating projects and assessing performance of the business).	3.41	.91	Moderate

Note: interpretation of mean scores (1-2.33) low, (2.34-3.67) moderate, (3.68-5) high.

7. Discussion

The present study has aimed to determine how different entrepreneurial attributes, such as self-regulatory focus, entrepreneurial self-efficacy and intention, influence the decision of university students to become entrepreneurs. Our results indicated that students had moderate scores in both promotion and prevention focus, which are dimensions of self-regulation. Regulatory focus is a function of personal successes and failures as well as situational factors (Higgins et al., 2001), so these moderate scores may reflect the students' past experiences in goal achievement. The majority of the students who participated in this research had no business experience and had never taken a course in entrepreneurship. Therefore, the environmental factors that have influenced their self-regulatory focus have been predominantly shaped by their family and education, which may have failed to create a strong sense of self-regulation in these students. Brockner et al. (2004) argue that the complex and challenging decision to become an entrepreneur and subsequent intention to explore new business ideas requires a high sense of regulatory focus. With a moderate level of self-regulation, students are less likely to explore new business ideas and enter into the challenging process of establishing new ventures.

Our findings also demonstrated that students are more prevention than promotion focused. This is in contrast with previous research indicating that entrepreneurs are more promotion focused (Tumasjan and Braun, in press; Trevelyan, 2011; Hmieleski and Baron; 2008; Bryant, 2007, 2006). This shifted balance towards prevention focus suggests a lower probability of success in these students' entrepreneurial activities (Bryant, 2007; Brockner et al., 2004). Our findings highlight an urgent need to improve students' promotion focus to motivate them to choose entrepreneurship as their future career path and improve the probability of their success in managing new ventures. To do so, educators may need to improve students' awareness of their regulatory orientation and provide them with opportunities to experience real entrepreneurial tasks (Trevelyan, 2011; Bryant, 2009, 2007). Involvement in these tasks not only helps students explore their capabilities in managing a new business, but also improves their ability to see the benefits and rewards of entrepreneurial activities (Trevelyan, 2011). For students who are prevention focused, highlighting these beneficial opportunities that they may not have otherwise explored may improve their motivation to pursue entrepreneurship as a future career (McMuller and Sheperd, 2002). Tumasjan and Braun (in press) emphasize the critical role that educators can play in helping students reflect on their entrepreneurial skills to further enhance their promotion focus by adopting a promotion focused orientation. Educators can also improve students' ability to see the benefits of entrepreneurial activities, rather than the costs and losses, to also improve their promotion focus (McMuller and Sheperd, 2002). Therefore, entrepreneurship educators need to be well trained and equipped with the skills to design and implement various pedagogical methods to improve regulatory focus of their students.

Interestingly, the findings of this study have revealed that students also perceived themselves as moderately successful in performing different tasks and roles of an entrepreneur. This confirms the association between self-regulation and self-efficacy in entrepreneurial contexts (Tumasjan and Barun, in press; Trevelyan, 2011; Bryant, 2007). Bandura (2012) argues that self-efficacy is the strongest predictor of behavior. Being moderately efficacious in successfully fulfilling entrepreneurial tasks, students may not have sufficient motivation and ability to enter the challenging process of entrepreneurship (Zhao et al., 2005). As emphasized by Chen et al. (1998), only students who are highly confident in their entrepreneurial skills have a strong intention and ability to become an entrepreneur. Furthermore, once becoming an entrepreneur, various behavioral and environmental factors reduce the sense of self-efficacy and hinder their success (Bandura, 2012). Therefore, students need high entrepreneurial self-efficacy to be able to face not only the challenges of entering entrepreneurship, but also the environmental difficulties that may interfere with their new business.

Entrepreneurship education can improve students' sense of entrepreneurial self-efficacy by engaging them in various learning opportunities such as business plan writing, role modeling and case studies (Wilson et al., 2007; Fayolle et al., 2006; Chen et al., 1998). Importantly, entrepreneurship education can provide an encouraging and supporting environment for students to manage a real new venture with low risk to develop their entrepreneurial self-efficacy rather than focusing only on theoretical aspects of entrepreneurship (Trevelyan, 2011; Fayolle and Gailly, 2008; Fuchs et al., 2008; Pittaway and Cope, 2007; Zhao et al., 2005). This is an issue that has been almost neglected by Malaysian entrepreneurship education (Cheng et al., 2009). Entrepreneurship education can also benefit from the associative and complementary relationship between entrepreneurial self-efficacy and regulatory focus (Tumasjan and Barun, in press; Bryant, 2007). To do so, entrepreneurship educators should utilize the previously established pedagogical methods for improving self-efficacy to also improve students' self-regulatory focus by emphasizing on more challenging

and experimental learning methods and stressing successful goal achievement (Tumasjan and Barun, in press; Heinonen, 2007; Wilson et al., 2007).

We also found that while university students have high intentions to learn entrepreneurship and to start their own businesses, the majority of them had no business experience and had never enrolled in an entrepreneurship course. This high entrepreneurial intention and desire to learn entrepreneurship should be exploited by educators, who should then provide university students with opportunities to engage in entrepreneurship education and practical training (Fuchs et al., 2008). It also confirms the need to integrate entrepreneurship education into the Malaysian university curriculum and to offer entrepreneurship courses to students in all fields through a coherent and comprehensive framework and structure (The World Bank Report, March 2007).

8. Conclusion

This study provides a better understanding of the level and pattern of entrepreneurial attributes among university students in Malaysia. In addition to investigating students' entrepreneurial self-efficacy, as has been done previously (Wilson et al., 2007; Fayolle et al., 2006; Zhao et al., 2005; Chen et al., 1998), we have also measured students' self-regulation and its dimensions. Furthermore, we have explored the impact of self-regulation and self-efficacy on entrepreneurial behavior in educational settings. Previously, researchers have studied this impact on entrepreneurial behavior based on samples only from entrepreneurs and then attempted to relate those results to entrepreneurship education (Tumasjan and Braun, in press; Bryant, 2009, 2006). Since previous research findings on personal traits of entrepreneurs have been contradictory (Bryant, 2006; Krueger et al., 2000, Mueller and Thomas, 2000; Ajzen, 1991), self-regulation, entrepreneurial self-efficacy and intention may provide a more helpful framework for investigating entrepreneurial capabilities among students (Trevelyan, 2011; Bryant, 2007; Wilson et al., 2007; Bryant, 2006; Zhao et al., 2005; Chen et al., 1998). While our study provides an overall look at these attributes in both private and public university students, further research may seek to compare the entrepreneurial attributes between these types of universities as well; thus allowing educators to more specifically tailor their programs for their students.

A combination of related constructs explaining entrepreneurial attributes (self-regulation, self-efficacy and intention) may contribute to the development of new theories in entrepreneurial behavior, including for university students. Assessing the entrepreneurial attributes may also help educators in three ways. First, educators can determine the different dimensions of these attributes in their students and provide them with more purposive and effective entrepreneurship education and training. Second, based on these strengths and weaknesses, educators can provide appropriate learning opportunities and an encouraging environment to strengthen students' regulatory focus and self-efficacy (Brockner et al., 2004). Third, educators can use the synergistic and complementary nature of these constructs to provide students with more effective entrepreneurship education.

Our findings raise critical questions for further investigations. Which aspects of self-regulatory focus (promotion and/or prevention) have a greater effect on students' entrepreneurial intention? Which aspects of students' self-regulatory focus lead to actual new business creation? How do students' self-regulation and entrepreneurial self-efficacy interact to regulate their entrepreneurial intention? How can different aspects of the entrepreneurial attributes emerging from this study, particularly promotion focus, be utilized to improve entrepreneurship education? Which aspects of entrepreneurial self-efficacy education can be applied to improve students' self-regulatory orientation? Finally, which skills and training do educators need to be able to improve students' entrepreneurial self-regulatory focus, self-efficacy and intention? Answers to these questions will undoubtedly give educators the knowledge to create better and more efficient entrepreneurship education programs, and so help increase the propensity and success of their students as entrepreneurs.

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Institutional Factors Lead to Voluntary Turnover (Case Study Kohgiluyeh Boyer Ahmad)

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Abstract: In this research; researcher has survived the organic factor, which causes the reround voluntary turning over in the state part of Kohgiluyeh Boyer Ahmad province in Iran. The statistic fields of this research wrought of 11000 people that number of 372 people were selected by clustering sample method as a model. This research is according to the correlation and for assembling the information, the questionnaire has been used. For analyzing the information has been used the statistic descriptive index (average, standard profusion and departure) statistic deductive methods (regression, analyzing the overhand variance and dependence T-groups test) and SPSS 18 software. The results are the representative of acceptance of research theory and it says that there is a meaningful relation between organic factors and tending to turnover in level of 0/05 of Alfa. Also being a meaningful relation for two aspects of organic factors which consist of structural factors of the organ and social factors of the organ with tending to turnover. By noticing to the regression results, we can say that 10/5 percent of changes in tending to turnover by organic factors are predictable. Finally for appointing the opponents organic factors proportion on inclination to turnover by using the step by step regression by sequence from first step till fifth step, payment system, distributive justice, proceeding justice, job stress and consistency had the most distribution on tending to turnover.

1. Introduction

Turnover and service factors that tend to leave the organization in achieving its goals are difficult to allocate a new job situation. Greatly to the success mental effort, motivation and satisfaction depends on its human resources. In other words, efficiency and effectiveness of its human with the efficiency and effectiveness of a direct dependence. Educational goals of the organization and use it to treat by managers when it is well deserving of the favorable environment. Job satisfaction, love and loyalty to the organization and staff development, creating an environment that is subject to the administrators, custodians and are responsible for it. Continuous and non-destructive sound is called the very place of contemplation. The consequences of job dissatisfaction, such as absence, displacement, and work out. Job dissatisfaction can be in sue maker of creation, the poor performance, reduced productivity, disciplinary problems, and ultimately, turnover is low work. Index of superiority to other organizations having a strong and committed workforce has been introduced. Human resources with organizational affiliations, loyal and consistent with the goals and values of the job duties and responsibilities that go beyond the operations, is a major factor in the performance of the organization (Sajjadi et al., 2009). Do the always this fear that

human capital losses and see her lose. During the years of effort and cost such as the cost of -related posts vacant, hired new staff, training and reduced productivity of the organization imposes to some of it we can a theory. R. J. The biological needs of human needs into three categories, the need to belong and the need to share is growing. Herzberg 2 factor theory, which needs to be divided into two categories of health and motivational factors. Theory of human behavior are due to swelling of the needs felt by counts. One of the problems and the problems of staff turnover is especially valuable professional staff. Managers and researchers edge of the more costly and problematic and threatening consequences associated with the performance of the organization know .That left the issue of service; attention has shifted to researchers and managers. So that over a century of research has been done on this subject (Saif, & Nikbakht Nasrabadi, 2004). Where a penalty on early retirement (voluntary retirement) during the past year many employees capable, governmental organizations were excluded. Notification regulations on early retirement of law enforcement, official staff, contract and contract administration in at least 25 years of service for at least 20 years for men and women without the condition of age, with a maximum of five years could be leniency years up to thirty years to retire. Conditions of employment

including salary, working hours, vacation, and retirement. Organizational factors include the method, patterns, support services. Factors, including communication with coworkers, personal factors including age, years of service, family responsibilities (Saif, & Nikbakht Nasrabadi, 2004). Contractual obligations will cause trouble and bother in playing. There have to be 70% of the total cost of this type of spending - that is, in effect, leave the employee will suffer. The other costs - these include the cost of supervision, employment, formal education, taxes and exit procedures (Smart Bahabad et al., 2004). Are to be removed with this method of organization. This issue is related to internal factors be? In other words, the organizational factors that can influence the governmental organization may apply for early retirement. Therefore, in this study, researchers sought to answer the question what causes the result to apply for early retirement of employees will be. Factors related to the organization of a group can be considered. Because the organization and the collective organization of relations between people or between people and the environment, be achieved. Factors related to the organization's ability to line organizational strategy, organizational structure, process, organizational and physical condition of split, no justice, stress and dissatisfaction, and ultimately tend to leave the job. Organizations including large and small, simple or complex the structure - are. A skeleton of a building structure can be likened. The structure of an organization should be commensurate with the goals of the organization. The skeleton of a building as a residential structure, industrial structure is different, because of its foundation is different, so can cause stress, stress, and dissatisfaction, and ultimately left the service member will be effective. The turnover is in people mentioned (and janitor Abzry, 1376: 104-101). Not every organization with a force and without any labor organization will be able to continue the yard. Therefore, understanding the needs, motive, the desire, satisfaction and dissatisfaction of employees is not only necessary but also to correct policies, strategies and programs are essential to effective is (Department of Statistics and Programmed and Budget, 2008.)

Schmidt's study of the relationship between job satisfaction and len showing early retirement - gives. There is some evidence that staff can apply for early retirement to positive attitude tend to give less attention to the work. By the excellent organization of the staff have more opportunity and a challenge to work low levels is less than the jobs they are seeking early retirement. Thus the incidence of dissatisfaction with the tendency to leave his field of service to become (Varzandeh, 2009).Despite dissatisfaction

with their jobs and organizations that employees may be resorted to.Purpose of job satisfaction, the general attitude about the job. The high level of satisfaction in her job, or jobs to work his positive attitude. Moreover, who do not satisfy their negative attitude to the job and is working. Hapak complex and multidimensional concept of job satisfaction factors that define mental, physical and social communication. With the emphasis on various factors including income, employment, social values, working conditions and product -time employment is different, different ways of job satisfaction to be (Saatchi, 2005). Because of the importance of job satisfaction due to more people that is almost half of their waking hours at work to spend. Job satisfaction is the extent of positive feelings and attitudes that individuals have toward their jobs. Factors affecting the job satisfaction - Outlook: resistance or charisma, the reward system based on justice and equality under the conditions that support individual, work colleagues and friends who help and support person (Robbins, 1378: 46). Vyksly and Yvkl (1984) Job satisfaction as an employee of a job are defined. According to the theory of Smith (1969), Job satisfaction is associated with the following six factors, work - paid - up - and staff - supervisors - the organization itself. Studies on job satisfaction show that variables associated with job satisfaction are many variables in the four-story have been organizational factors, personal factors, environmental factors and social factors. Cotton and Tuttle Studies show that employees from the payment system, the supervision, nature of work and opportunities for growth and development in organizations are satisfied with a lower likelihood of organization will leave. Failure of employment in administrative and maintenance staff tended to leave the service of the organization's effectiveness. The data were randomly distributed. Pashazadh in the 1379 "Survey of University staff turnover" has tried to ¬ main factors that cause employees to leave the service to provide identification. Be Culture, organizational learning, improved feedback, learning objectives, thanks to the prep's and organizational commitment are expected. Finally, the organizational learning culture, job satisfaction, organizational commitment and the nose for are likely to leave the service. In another study by Aplbam and colleagues in 2009 in Canada with way for desertion was excessive. Became apparent that the organizational commitment of employees, their turnover will affect. The relationship between job satisfaction and turnover in this study did not receive support. Release of potential evidence provided. To cover a wide range of backgrounds, pre the provision of a variety of theoretical approaches can be.

1 - Traditional Furniture turnover theory.
2 - Expect swelling theory.
3 - The theory of planned behavior The Jzn program.

External evidence to show that job satisfaction was negatively and positively with the turnover of jobs (to stay) is relevant. Christopher Brown, research, analysis, and others (2005) showed that the relationship between job satisfaction suit of an individual - and quit the service because the agency is organizations, individuals and work they change over time.Gryft and others (2000), Martz and Kampyvn (1998) expressed a commitment to the organization can be a good reason to remain a member of the organization for a long time in the organization. That they tend to stay there will be differences. I expected to respect the cessation of service, different, concluded that the evidence for meaningful differences (e.g., job satisfaction, commitment, alternative employment available, the expected income, attitudes to the left service and subjective norm) between the groups of potential users abandons there. In van Hayjdn, and Van Dam (2009) in research as "the desire to get rid of Nursing", to examine the nose the potential of nurses willing to leave the nursing profession began. This in turn tends to leave the nursing profession, when controlling for occupational commitment is pre not expected. A main argument was made known. This research was focused on the relationship between job satisfaction and turnover to study how the profession or job turnover by moderating or mediating the be. The study found strong support for the negative relationship between job satisfaction and employees tend to leave the service provided. Profession or occupation as the key to job satisfaction, willingness to turnover and job satisfaction - turnover is linked to. Non-employee and first line management, a higher level of desire to quit jobs than are employees and management.Mvnkarz and Z·ha (2009) in a study titled "An exploratory study of organizational activities, United States on survival and employee turnover" to conclude that the organizational culture, active employment, promotion and retention of staff in the Ghyrmdyryty will affect. Employment and promotion activities will also remain on the affected managers. Also found that organizational mission, goals and direction of the organization and knowledge of employees, compensation system to reward and a positive non-managerial staff turnover will reduce. Service leave or not? Be used. Organizational understanding and commitment to the provision of a pre matter of wanting to quit was served. Employees with lower levels of organizational commitment, but with a high level of institutional support, the less likely they will leave. In perceptions between managers and employees of management, there is good faith. Most of the managers and employees on aspects of the concrete soft touch and its focus. Left the service tends to change jobs or related companies, and readiness to change with the desire to change an employee's current work is related to his .Both phenomena are associated with the eligible employees. For example, an employee with the flexibility to adapt internal and external labor market demand, are related. The main purpose of this paper to compare both phenomena and identify that eligible prior employment, in other words, following the change - and the leader's job performance.

The results showed that the two concepts (a desire to leave the service, readiness for change) and are associated with extensive and somewhat similar relationship with the former variables are. In addition, staff turnover are willing to pay. The aim of this study and the associated impact on combined they tend to leave the service. The research findings showed that motivation inside the nose is a very strong desire to leave the service. Competence approach goals positively associated with leaving the service, but this relationship was mediated by the mediation of internal motivation. The relationship between competence and willingness to approach the turnover for employees with low intrinsic motivation was positive. Mac Mans, and Andrbrg (2007) in the study, "Retirement - A reach of prosperity" to show that retirement is not out of reach, but not being able to retire may not be a bad thing, and left work to stay in.

2. The Research Methodology

The statistics in this study of public sector employees are Kohgiluyeh Boyer is received, according to statistics, 11,000 will be 80 units of work in government. How many units as the sample are selected? To select the sample size between those of the general formula used is Cochrane. To check the assumptions of a standard questionnaire that Kim and colleagues (1996) has been prepared, were used. By Kim and colleagues in 1996 and prepared by Price in the research as "theory about the determinants of voluntary turnover are provided" (Price, 2001: 624-617). The questionnaire in both structural and social impact of organizational factors as independent variables, on the turnover as the dependent variable has been studied. For review and analysis of data from descriptive statistics (frequency, percentage, cumulative percentage) and inferential statistics, (regression, one-way analysis of variance, groups, independent t-test) was used. In addition, from 18-spss software is used (See Figure 1).

3. Research Finding

A sample of 372 subjects participated in this study, equivalent to 245 9 / 65 percent were men and

127 per 1 / 34 percent of women have formed. Men participating in the test population almost doubled the population of women is. 298 people, equivalent to 1 / 80 percent of the participants in this study of 74 patients married and 9 / 19 percent of single people have formed. The number of companies in the test study, almost married, has four times the Singles. Number equivalent to 91 5 / 24 percent of participants in this study Yasuj, equivalent to 60 1 / 16 percent of the hard C, equivalent to 85 8 / 22 percent of Gachsaran, equivalent to 75 2 / 20 percent Dehdasht of the city, equivalent to 61 4 / 16 percent of the city are Chram be. Most of the participants Yasuj least thirty participants was difficult.45/2 of the 168 people who experienced the following ten years to ten years to serve.

Moreover, 0 / 36% equivalent to 134 people with a history of over ten years to twenty years have ¬ formed. In addition, 8 / 18 to 70 percent of people over twenty years to thirty years have formed9/4% of the sample equivalent to 35 people with a degree, 6 / 33 of the 125 people with a degree in diploma, 7 / 48 percent of 181 people with a bachelor's degree, 1 / 8 percent, equivalent to 30 Individuals with a bachelor's degree in 3 / 0 to 1 percent of people with doctorate degrees have been. The highest percentage to lowest percentage of people with a bachelor's degree and has been owned by people with doctorate degrees. 60/2 percent of 224 samples of individuals with employment status officially 21/8 of the 81 people with a condition of employment contract and 0 / 18% equivalent to 67 individual samples with the employment contract form said. Most belong to the official employment status and employment status to contract has been minimal.Suggests that significant regression is. Therefore, because the statistic t (945/2-) at the alpha level of 0 / 05 out of the area is zero, the research hypothesis that there is a relation between satisfaction with relationships with colleagues and left the service tend to be accepted is variable. The satisfaction of relationships with colleagues, left the service tends to be cut and vice versa. It determines the type of behavior in organizations where employees stay or leave. Also Bahabad intelligence and others (2004) in relation to social factors, drawing the non-academic careers for nurses and also factors relevant authorities and lack of attention to the suggestions and feedback from nurses and the lack of necessary support to managers and supervisors and as effective as they leave the service, which is consistent with the results of this study. Share a desire to leave the service of organizational factors is how much?

By noticing to the table 1 and 2, quantity of calculated F (35/039) with option degrees 1 and 370 in the 0/05 of Alfa level is more than the table quantity. It shows that the regression is meaningful. So because the quantity statistic of t (-5/919) in the Alfa 0/05 level is out of the acceptance area of zero theory, research theory is based on meaningful relation between organic structure factors and tending to turning over will be accepted. Also by remarking to the table 3 standard quantity between organic structure factors variant as the predictive variant and volunteer turning over as the determined variant is equal 0/294 that this negative quantity shows the reverse relation between variants .

It means that with increasing the satisfaction of organic structure factors turning over will decrease and by decreasing the organic structure factors satisfaction, turning over will increase. Finally, by noticing to the presented determined coefficient in the table 1, we can say that 8/7 % of the changes in the turning over by organic structures factors is predictable (See Tables 1, 2 and 3).

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Payment system and turning over

There is a meaningful relation between payment system and volunteer turning over.

While the researcher is going to consider the being meaningful relation between predictive variant and determined variant in the above theory, the regression test has been used that it has been described in the down table (See Tables 4, 5 and 6).

By noticing to the table 4 and 5, quantity of calculated F (420/448) with option degrees 1 and 370 in the 0/05 of Alfa level is more than the table quantity. It shows that the regression is meaningful. So because the quantity statistic of t (-20/505) in the Alfa 0/05 level is out of the acceptance area of zero theory, research theory is based on meaningful

relation between satisfaction of payment system and tending to turning over will be accepted. Also by remarking to the table 6 standard quantity between satisfaction payment system variant as the predictive variant and volunteer turning over as the determined variant is equal 0/729 that this negative quantity shows the reverse relation between variants. It means that with increasing the satisfaction of payment, system turning over will decrease and by decreasing the satisfaction of payment system, turning over will increase.Finally, by noticing to the presented determined coefficient in the table 6, we can say that 53/2 % of the changes in the turning over by satisfaction of payment system are predictable.

Golkar (1375), Moradi (1377), Monkarez and Zeha (2009) and Bergel and others (2009) researches which have been done in this part, are about payment system and service compensating and also they have the same result with this research (See Tables 4, 5 and 6).

Upgrading processes and turning over

There is a meaningful relation between satisfaction of upgrading processes and volunteer turning over. While the researcher has used regression test to consider the being of a meaningful relation between predictive variant and determined variant in the above theory which they have been described in the down tables (See Tables 7, 8 and 9).

By noticing to the table 7 and 8, quantity of calculated F (8/991) with option degrees 1 and 370 in the 0/05 of Alfa level is more than the table quantity. It shows that the regression is meaningful. So because the quantity statistic of t (-2/999) in the Alfa 0/05 level is out of the acceptance area of zero theory, research theory is based on meaningful relation between satisfaction of increasing system and tending to turning over will be accepted. Also by remarking to the table 9 standard quantity between satisfaction increasing system variant as the predictive variant and volunteer turning over as the determined variant is equal 0/154 that this negative quantity shows the reverse relation between variants. It means that with increasing the satisfaction of increasing system, turning over will decrease and by decreasing the satisfaction of increasing system, turning over will increase. Finally, by noticing to the presented determined coefficient in the table 9, we can say that 2/4 % of the changes in the turning over by satisfaction of increasing system are predictable.

Moieni badi (1379) and Pashazade (1378) in their research, impossibility of a suitable increasing is one of the staffs turning over causes that are similar with present results (See tables 7, 8 and 9).

Job independence and turning over

There is a meaningful relation between satisfactions of job independence and tending to volunteering turning over.

While the researcher is going to consider the being meaningful relation between predictive variant and determined variant in the above theory, the regression test has been used that it has been described in the down table.

By noticing to the table 10 and 11, quantity of calculated F (4/597) with option degrees 1 and 370 in the 0/05 of Alfa level is more than the table quantity. It shows that the regression is meaningful.

So because the quantity statistic of t (-2/144) in the Alfa 0/05 level is out of the acceptance area of zero theory, research theory is based on meaningful relation between satisfaction of job independence and tending to turning over will be accepted. Also by remarking to the table 11 standard quantity between satisfaction job independence variant as the predictive variant and volunteer turning over as the determined variant is equal 0/111 that this negative quantity shows the reverse relation between variants. It means that with increasing the satisfaction of job independence, turning over will decrease and by decreasing the satisfaction of job independence, turning over will increase. Finally, by noticing to the presented determined coefficient in the table 19-4, we can say that 1 % of the changes in the turning over by satisfaction of job independence are predictable. The result of this research with the result of Tousi Rad research (1381) about the job independence and tending to turning over is similar (See Tables 10, 11 and 12).

Job duty bound and turning over

There is a meaningful relation between job duty bound and volunteering tending to turning over. While the researcher is going to consider the being meaningful relation between predictive variant and determined variant in the above theory, the regression test has been used that it has been described in the down table (See Tables 13, 14 and 15).

By noticing to the table 13 and 14, quantity of calculated F (8/972) with option degrees 1 and 370 in the 0/05 of Alfa level is more than the table quantity. It shows that the regression is meaningful. So because the quantity statistic of t (-2/995) in the Alfa 0/05 level is out of the acceptance area of zero theory, research theory is based on meaningful relation between satisfaction of job duty bound and tending to turning over will be accepted. Also by remarking to the table 15 standard quantity between satisfaction job duty bound variant as the predictive variant and volunteer turning over as the determined variant is equal 0/154 that this negative quantity shows the reverse relation between variants. It means that with increasing the satisfaction of job duty

bound, turning over will decrease and by decreasing the satisfaction of job duty bound, turning over will increase. Finally, by noticing to the presented determined coefficient in the table 15, we can say that 2/4 % of the changes in the turning over by satisfaction of job duty bound are predictable. The result of this research with the result of Varzande research (2009) about the job duty bound is similar.

Job stress and turning over

There is a meaningful relation between job stress and volunteering turning over.

While the researcher is going to consider the being meaningful relation between predictive variant and determined variant in the above theory, the regression test has been used that it has been described in the down table (Tables 16, 17 and 18).

By noticing to the table 16 and 17, quantity of calculated F (71/947) with option degrees 1 and 370 in the 0/05 of Alfa level is more than the table quantity. It shows that the regression is meaningful. Therefore, because the quantity statistic of t (8/482) in the Alfa 0/05 level is out of the acceptance area of zero theory, research theory is based on meaningful relation between satisfactions of job stress and tending to turning over will be accepted. Also by remarking to the table 18 standard quantity between satisfaction job stress variant as the predictive variant and volunteer turning over as the determined variant is equal 0/403 that this negative quantity shows the reverse relation between variants. It means that with increasing the satisfaction of job stress, turning over will decrease and by decreasing the satisfaction of job stress, turning over will increase. Finally, by noticing to the presented determined coefficient in the table 18, we can say that 16/3 % of the changes in the turning over by satisfaction of job duty bound are predictable. The result of this research with the result of Golkar research (1375) has recalled the stress as the mental pressure and he has emphasized on the meaningful relation between tending to turning over and job stress. And Rahpeima (1378) being up the job dangerous and job stress and not having the safety programs, he has mentioned to these problems which they are the most main causes about tending to turning over.

Distributive justice and turning over

There is a meaningful relation between satisfaction of job distributive justice and volunteering turning over.

While the researcher is going to consider the being meaningful relation between predictive variant and determined variant in the above theory, the regression test has been used that it has been described in the down table (See Tables 19, 20 and 21).

By noticing to the table 19 and 20, quantity of calculated F (367/232) with option degrees 1 and 370 in the 0/05 of Alfa level is more than the table quantity. It shows that the regression is meaningful. Therefore, because the quantity statistic of t (-19/163) in the Alfa 0/05 level is out of the acceptance area of zero theory, research theory is based on meaningful relation between satisfactions of distributive justice and tending to turning over will be accepted. Also by remarking to the table 21 standard quantity between satisfaction distributive justice variant as the predictive variant and volunteer turning over as the determined variant is equal 0/706 that this negative quantity shows the reverse relation between variants. It means that with increasing the satisfaction of distributive justice, turning over will decrease and by decreasing the satisfaction of distributive justice, turning over will increase. Finally, by noticing to the presented determined coefficient in the table 21, we can say that 49/8 % of the changes in the turning over by satisfaction of distributive justice are predictable.

Proceeding Justice And Turning Over

There is a meaningful relation between satisfaction of proceeding justice and volunteering turning over.

While the researcher is going to consider the being meaningful relation between predictive variant and determined variant in the above theory, the regression test has been used that it has been described in the down table (see Tables 22, 23 and 24).

By noticing to the table 21 and 22, quantity of calculated F (197/768) with option degrees 1 and 370 in the 0/05 of Alfa level is more than the table quantity. It shows that the regression is meaningful.

Therefore, because the quantity statistic of t (-14/064) in the Alfa 0/05 level is out of the acceptance area of zero theory, research theory is based on meaningful relation between satisfactions of proceeding justice and tending to turning over will be accepted. Also by remarking to the table 33-4 standard quantity between satisfaction proceeding justice variant as the predictive variant and volunteer turning over as the determined variant is equal 0/590 that this negative quantity shows the reverse relation between variants. It means that with increasing the satisfaction of proceeding justice, turning over will decrease and by decreasing the satisfaction of distributive justice, turning over will increase. Finally, by noticing to the presented determined coefficient in the table 23, we can say that 34/8 % of the changes in the turning over by satisfaction of proceeding justice are predictable.

Consistency and turning over

There is a meaningful relation between satisfaction of consistency and volunteering turning over.

While the researcher is going to consider the being meaningful relation between predictive variant and determined variant in the above theory, the regression test has been used that it has been described in the down table (Tables 25, 26 and 27).

By noticing to the table 25 and 26, quantity of calculated F (13/158) with option degrees 1 and 370 in the 0/05 of Alfa level is more than the table quantity. It shows that the regression is meaningful. Therefore, because the quantity statistic of t (3/627) in the Alfa 0/05 level is out of the acceptance area of zero theory, research theory is based on meaningful relation between satisfactions of consistency and tending to turning over will be accepted. Also by remarking to the table 26 standard quantity between satisfaction consistency variant as the predictive variant and volunteer turning over as the determined variant is equal 0/185 that this positive quantity shows the direct relation between variants. It means that with increasing the satisfaction of consistency, turning over will decrease and by decreasing the satisfaction of consistency, turning over will decrease. Finally, by noticing to the presented determined coefficient in the table 34-4, we can say that 3/4 % of the changes in the turning over by satisfaction of consistency are predictable. This research results are similar to Hakman & Oldhem (1975) and Larsen & Lakin (1999).

In addition, it is based on that the different and challengeable jobs have been satisfied more than simple and common jobs. In addition, it can lead the staffs to do the best against the official jobs and repetitive duties.

The Second Secondary Theory
There is a meaningful relation between satisfactions of organic social aspects with tending to volunteering turning over.

While the researcher is going to consider the being meaningful relation between predictive variant and determined variant in the above theory, the regression test has been used that it has been described in the down table (Tables 27, 28 and 29).

By noticing to the table 28 and 29, quantity of calculated F (16/318) with option degrees 1 and 370 in the 0/05 of Alfa level is more than the table quantity. It shows that the regression is meaningful. Therefore, because the quantity statistic of t (-4/040) in the Alfa 0/05 level is out of the acceptance area of zero theory, research theory is based on meaningful relation between satisfactions of organic social factors and tending to turning over will be accepted. Also by remarking to the table 29 standard quantity between satisfaction of organic social factors variant

as the predictive variant and volunteer turning over as the determined variant is equal 0/206 that this negative quantity shows the reverse relation between variants. It means that with increasing the satisfaction of organic social factors, tending to turning over will decrease and by decreasing the satisfaction of organic social factors, tending to turn over will increase. Finally, by noticing to the presented determined coefficient in the table 27, we can say that 4/2 % of the changes in the turning over by satisfaction of organic social factors are predictable.

Have Relation with supervisors and tending to turn over
There is a meaningful relation between satisfactions of have relation with supervisors tending to volunteering turn over.

While the researcher is going to consider the being meaningful relation between predictive variant and determined variant in the above theory, the regression test has been used that it has been described in the down table.

By noticing to the table 31 and 32, quantity of calculated F (11/371) with option degrees 1 and 370 in the 0/05 of Alfa level is more than the table quantity. It shows that the regression is meaningful. Therefore, because the quantity statistic of t (-3/372) in the Alfa 0/05 level is out of the acceptance area of zero theory, research theory is based on meaningful relation between satisfactions of have a relation with supervisors and tending to turn over will be accepted. Also by remarking to the table 32 standard quantity between satisfaction of have a relation with supervisors variant as the predictive variant and volunteer turning over as the determined variant is equal 0/173 that this negative quantity shows the reverse relation between variants. It means that with increasing the satisfaction of have a relation with supervisors, tending to turn over will decrease and by decreasing the satisfaction of have a relation with supervisors, tending to turn over will increase.

Finally, by noticing to the presented determined coefficient in the table 30, we can say that 3 % of the changes in the turning over by having a relation with supervisors is predictable.

Have a relation with counterparts and tending to turn over
There is a meaningful relation between satisfactions of have relation with supervisors tending to volunteering turn over.

While the researcher is going to consider the being meaningful relation between predictive variant and determined variant in the above theory, the regression test has been used that it has been described in the down table.

By noticing to the table 34 and 35, quantity of calculated F (8/671) with option degrees 1 and 370 in the 0/05 of Alfa level is more than the table quantity. It shows that the regression is meaningful. Therefore, because the quantity statistic of t (-2/945) in the Alfa 0/05 level is out of the acceptance area of zero theory, research theory is based on meaningful relation between satisfactions of have a relation with counterparts and tending to turn over will be accepted. Also by remarking to the table 35 standard quantity between satisfaction of have a relation with counterparts variant as the predictive variant and volunteer turning over as the determined variant is equal 0/151 that this negative quantity shows the reverse relation between variants. It means that with increasing the satisfaction of have a relation with counterparts, tending to turn over will decrease and by decreasing the satisfaction of have a relation with counterparts, tending to turn over will increase. Finally, by noticing to the presented determined coefficient in the table 33, we can say that 2/3 % of the changes in the turning over by having a relation with counterparts are predictable. Haton & Emerson (1998), according to their findings they believed that organic social factors that consist of having a relation with counterparts and supervisors have an important role in tending to turn over. In fact, the kinds of their behavior determine whether that counterparts stay in an office or leave it. Also Houshmandi's and others smartness (2004) in a subject to social factors, supposing the unscientific place for nurses and also professional factors and not considering the managers to the nurses suggestions and ideas and not supporting of the managers and supervisors in the necessary positions are the most effective factors to turn over.

How much is the share of the each one of the organic factors for tending to turn over?

Now by using the systematic regression, we determine the organic factors share in tending to turn over:

By noticing to the table 37 in analyzing the handover variant, for determining the organic factors share in the first step, the predictive variant is payment system that has been entered that the quantity calculated F (420/448) with option degree 1 and 370 for payment system in the level of Alfa 0/05 is more than the table quantity. It shows the meaningful regression for payment system.by noticing to the table 36 the quantity of standard coefficient payment system, tending to turn over is 0/729, and the quantity of determined coefficient for tending to turn over by payment system is equal 0/532. In addition, the determined quantity of t is (-20/505) that for this variant in the first step in the table 38 with the 0/001 meaningful level shows that

the payment system in the organic factors have the most share in the prediction of tending to turn over and the quantity of standard coefficient for payment system (-0/729) shows the powerful and reverse relation between tending to turn over and payment.

In the second step payment system and distributive justice, variants have entered as the predictive variants. The quantity of calculated F (373/097) with 2 and 369 option degree that is more than the table quantity for them in the 0/05 of Alfa level. In addition, it shows the meaningful regression for payment system and distributive justice. By noticing to the table 36, the quantity of standard coefficient for payment system and distributive justice is 0/818 and the quantity of determined coefficient for tending to turn over by payment system and distributive justice is equal 0/669. The quantity of calculated t is (-12/370,-13/809) that for these variants in the second step and in the table 48-4 with the meaningful level of 0/001 shows that the payment system and distributive justice between the organic factors in the second step have the most share in the tending to turn over by sequence. The quantity of standard coefficient for these factors (-0/440,-0/491) shows the strong and reverse relation between payment system and distributive justice for tending to turn over.

In the third step payment system and distributive justice and proceeding justice, variants have entered as the predictive variants. The quantity of calculated F (275/431) with 3 and 368 option degree that is more than the table quantity for them in the 0/05 of Alfa level. In addition, it shows the meaningful regression for payment system, distributive justice and proceeding justice. By noticing to the table 37, the quantity of standard coefficient for payment system and distributive justice and proceeding justice is 0/832 and the quantity of determined coefficient for tending to turn over by payment system, distributive justice and proceeding justice is equal 0/692. The quantity of calculated t is (-5/213,-10/111,-12/280) that for these variants in the third step and in the table 38 with the meaningful level of 0/001 shows that the payment system and distributive justice and proceeding justice between the organic factors in the second step have the most share in the tending to turn over by sequence. The quantity of standard coefficient for these factors (-0/184,-0/372,-0/440) shows the reverse relation between the variants for tending to turn over.

In the fourth step payment system and distributive justice and proceeding justice and job stress, variants have entered as the predictive variants. The quantity of calculated F (223/812) with 4 and 367 option degree that is more than the table quantity for them in the 0/05 of Alfa level. In

addition, it shows the meaningful regression for payment system, distributive justice and proceeding justice and job stress. By noticing to the table 48-4, the quantity of standard coefficient for payment system and distributive justice and proceeding justice and job stress is 0/849 and the quantity of determined coefficient for tending to turn over by payment system, distributive justice and proceeding justice and job stress is equal 0/709.

The quantity of calculated t is (4/648,-4/863,-9/749, -11/935) that for these variants in the fourth step and in the table 48-4 with the meaningful level of 0/001 shows that the payment system and distributive justice and proceeding justice and job stress between the organic factors in the fourth step have the most share in the tending to turn over by sequence. The quantity of standard coefficient for payment system, distributive justice, proceeding justice and job stress is (0/140, -0/168, -0/352, -0/419) that shows the reverse relation for the these three variants, payment system, distributive justice and proceeding justice and also it has a direct relation with job stress variant for tending to turn over.

In the fifth step payment system and distributive justice, proceeding justice, job stress and consistency, variants have entered as the predictive variants. The quantity of calculated F (182/974) with 5 and 366 option degree that is more than the table quantity for them in the 0/05 of Alfa level. In addition, it shows the meaningful regression for payment system, distributive justice, proceeding justice, job stress and consistency. By noticing to the table 57-4, the quantity of standard coefficient for payment system, distributive justice, proceeding justice, job stress and consistency is 0/845 and the quantity of determined coefficient for tending to turn over by payment system, distributive justice, proceeding justice, job stress and consistency is equal 0/714. The quantity of calculated t is (2/451,4/813,-5/047, -9/429, -11/788) that for payment system, distributive justice, proceeding justice, job stress and consistency in the fifth step and in the table 48-4 with the meaningful level of 0/015 for consistency variant shows that payment system, distributive justice, proceeding justice, job stress and consistency between the organic factors in the fifth step have the most share in the prediction of tending to turn over by sequence.

The quantity of standard coefficient for payment system, distributive justice, proceeding justice, job stress and consistency is (0/070, 0/143, -0/173, -0/340,-0/412) that shows the reverse relation for the these three variants, payment system, distributive justice and proceeding justice and also it has a direct

relation with job stress and consistency variant for tending to turn over.

It is necessary to say that other factors that are related to the organic factors (upgrading proceeding, job independence, and job belief, relation with counterparts and relation with supervisors) for ignoring by above factors which have been told, they have been omitted and their effects have been inactived. In addition, the results of table 48-4 are according to the down statistics:

The quantity of standard coefficient between the payment system and tending to turn over is equal -0/412 that this quantity in the level of t=-11/788 and in the level of 0/01 is more than the table level. Therefore, by 99% surety, we can say that the payment system variant can be effective in turning over prediction.

The quantity of standard coefficient between the distributive justice and tending to turn over is equal -0/340 that this quantity in the level of t=-9/429 and in the level of 0/01 is more than the table level. Therefore, by 99% surety, we can say that the distributive justice variant can be effective in turning over prediction.

The quantity of standard coefficient between the proceeding justice and tending to turn over is equal -0/173 that this quantity in the level of t=-5/047 and in the level of 0/01 is more than the table level. Therefore, by 99% surety, we can say that the proceeding justice variant can be effective in turning over prediction.

The quantity of standard coefficient between the job stress and tending to turn over is equal 0/143 that this quantity in the level of t=4/813 and in the level of 0/01 is more than the table level. Therefore, by 99% surety, we can say that the job stress variant can be effective in turning over prediction.

The quantity of standard coefficient between the consistency and tending to turn over is equal 0/070 that this quantity in the level of t=2/451 and in the level of 0/05 is more than the table level. Therefore, by 99% surety, we can say that the consistency variant can be effective in turning over prediction.

Now by using the results in the fifth step of the table 38, the statistically relation for having the relation between organic factors and tending to turn over are according to the down statistics:

Y: tending to turn over (determined variant)
X1: payment system (predictive variant)
X2: distributive justice (predictive variant)
X3: proceeding justice (predictive variant)
X4: job stress (predictive variant)
X5: consistency (predictive variant)

Figur 1: Research Procedure
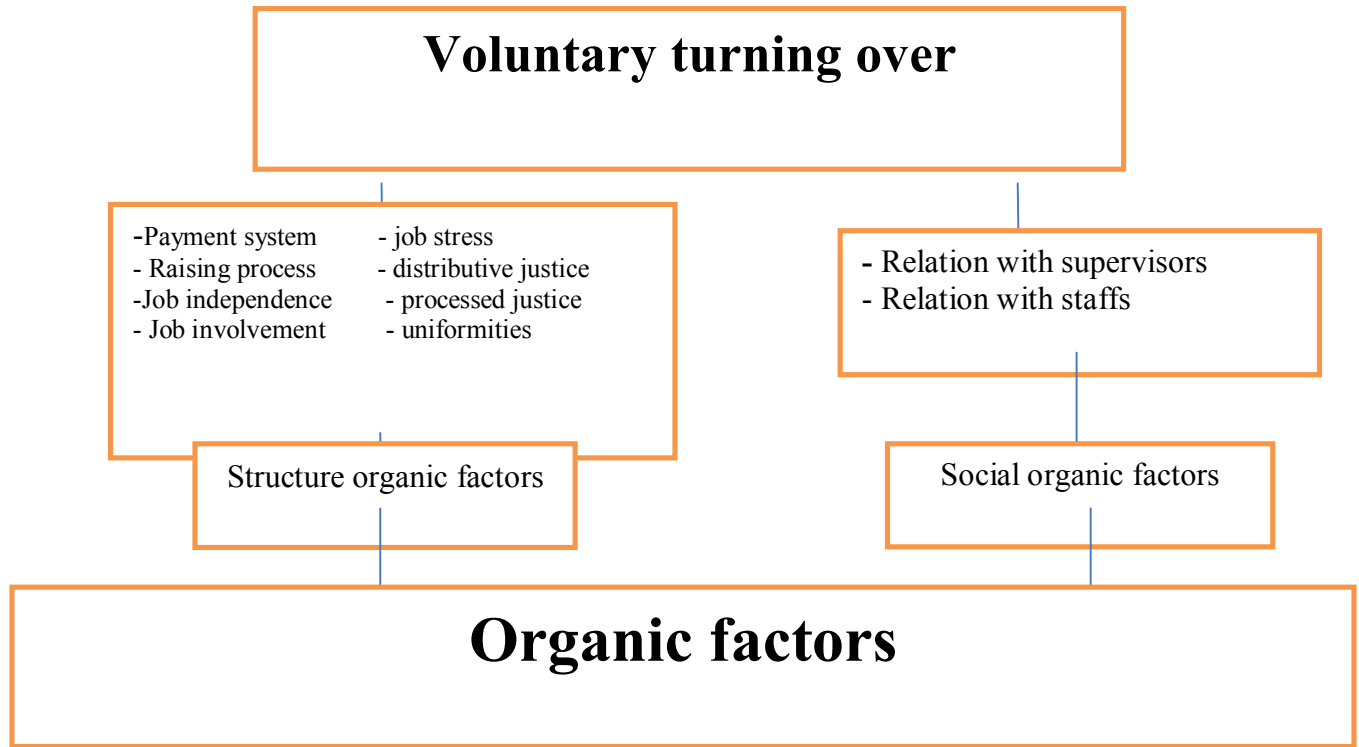
Table 1: Regression Model Summary

Model	Determination of coefficient
1	0/087

Table 2: Analyzing the Overhand Variance of the Structure Organic Factors and Turning Over

Model	Total of squares	Optional degree	Average of squares	Test statistic	Meaningful level
Regression	205/971	1	205/971	35/039	0/000
Remainder	2174/986	370	5/878		
Total	2380/956	371			

Table 3: Regression Meaningful Table of Structure Organic Factors

Model	Not being standard		Standard	T	Meaningful level
Offset width of the organic structure factors	B	Standard error	Beta	21/608	0/000
			-0/294	-5/919	0/000
	22/807	0/936			
	-0/042	0/007			

Table 4: Regression Model Summary

Model	Determined coefficient
1	0/532

Table 5: Analyzing the Handover Variance of the Payment System and Turning over Satisfaction

Model	Total of squares	Option degree	Average of squares	Statistic of test	Meaningful level
Regression	1266/45	1	1266/45	420/448	0/000
Remainder	1114/499	370	3/012		
Total	2380/957	371			

Table 6: Regression Meaningful Satisfaction Table of the Payment System

Model	Not standard		Standard	T	Meaningful level
Width offset of the payment system	B	Standard error	Beta	79/150 -20/505	0/000 0/000

Table 7: Regression Model Summery

Model	Determination of coefficient
1	0/024

Table 8: Analyzing the Handover Variance of the Satisfaction Increasing System and Turning Over

Model	Total of squares	Option degree	Average of squares	Statistic of test	Meaningful level
Regression	56/487	1	56/487	8/991	0/003
Remainder	2324/470	370	6/282		
Total	2380/957	371			

Table 9: The Meaningful Regression Table for Increasing System

Model	Being standard		Standard Beta	T	Meaningful level
With offset of the increasing system	B 16/494 -0/112	Standard errors 0/465 0/037	-0/154	35/492 -2/999	0/000 0/003

Table 10: Regression Model Summary

Model	Determined coefficient
1	0/010

Table 11: Analyzing the Handover Variant for Job Independence and Turning Over

Model	Total of squares	Option degree	Average of squares	Statistic of test	Meaningful level
Regression	29/220	1	29/220	4/597	0/033
Remainder	2351/737	370	6/356		
Total	2380/957	371			

Table 12: Regression Meaningful Table for Job Independence

Model	Not standard		Standard	T	Meaningful level
Job independence width offset	B 16/122 -0/065	Standard errors 0/469 0/03	Beta -0/111	34/373 -2/144	0/000 0/033

Table 13: Regression Model Summary

Model	Determined coefficient
1	0/024

Table 14: Analyzing the Handover Variant for Job Duty Bound and Turning Over

Model	Total of squares	Option degree	Average of squares	Statistic of test	Meaningful level
Regression	56/368	1	56/368	8/972	0/003
Remainder	2324/589	370	6/283		
Total	2380/957	371			

Table 15: Regression Meaningful Table for Job Duty Bound

Model	Not standard		Standard	T	Meaningful level
Job independence width offset	B 16/386 -0/087	Standard errors 0/431 0/029	Beta -0/154	38/051 -2/995	0/000 0/033

Table 16: Regression Model Summary

Model	Determined coefficient
1	0/0163

Table 17: Analyzing the Handover Variant for Job Stress and Turning Over

Model	Total of squares	Option degree	Average of squares	Statistic of test	Meaningful level
Regression	387/611	1	387/611	71/947	0/003
Remainder	1993/346	370	5/387		
Total	2380/957	371			

Table 18: Regression Meaningful Table for Job Stress

Model	Not standard		Standard	T	Meaningful level
Job stress width offset	B	Standard errors	Beta		
	10/669	0/543	-0/403	19/665	0/000
	-0/093	0/012		-8/482	0/000

Table 19: Regression Model Summary

Model	Determined coefficient
1	0/498

Table 20: Analyzing the Handover Variant for Distributive Justice and Turning Over

Model	Total of squares	Option degree	Average of squares	Statistic of test	Meaningful level
Regression	1186/009	1	1186/009	367/232	0/000
Remainder	1194/948	370	3/230		
Total	2380/957	371			

Table 21: Regression Meaningful Table for Distributive Justice

Model	Not standard		Standard	T	Meaningful level
Distributive justice width offset	B	Standard errors	Beta		
	19/865	0/263	-0/706	75/587	0/000
	-0/296	0/015		-19/163	0/000

Table 22: Regression Model Summary

Model	Determined coefficient
1	0/348

Table 23: Analyzing the Handover Variant for Proceeding Justice and Turning Over

Model	Total of squares	Option degree	Average of squares	Statistic of test	Meaningful level
Regression	829/398	1	829/398	197/768	0/000
Remainder	1551/559	370	4/193		
Total	2380/957	371			

Table 24: Regression Meaningful Table For Proceeding Justice

Model	Not standard		Standard	T	Meaningful level
Proceeding justice width offset	B	Standard errors	Beta		
	19/826	0/349	-0/590	56/865	0/000
	-0/278	0/020		-14/064	0/000

Table 24: Regression Model Summary

Model	Determined coefficient
1	0/034

Table 25: Analyzing the Handover Variant for Consistency and Turning Over

Model	Total of squares	Option degree	Average of squares	Statistic of test	Meaningful level
Regression	81/763	1	81/763	13/158	0/000
Remainder	2299/194	370	6/214		
Total	2380/957	371			

Table 26: Regression Meaningful Table For Consistency

Model	Not standard		Standard	T	Meaningful level
Consistency width offset	B	Standard errors	Beta		
	13/621	0/442	-0/185	30/793	0/000
	-0/126	0/035		3/627	0/000

Table 27: Regression Model Summary

Model	Determined coefficient
1	0/042

Table 28: Analyzing the Handover Variant for Organic Social Factors and Turning Over

Model	Total of squares	Option degree	Average of squares	Statistic of test	Meaningful level
Regression	100/569	1	100/569	16/318	0/000
Remainder	2280/388	370	6/163		
Total	2380/957	371			

Table 29: Regression Meaningful Table for Organic Social Factors

Model	Not standard		Standard	T	Meaningful level
Organic social factors width offset	B	Standard errors	Beta		
	17/960	0/706	-0/206	25/437	0/000
	-0/104	0/026		-4/040	0/000

Table 30: Regression Model Summary

Model	Determined coefficient
1	0/030

Table 31: Analyzing the Handover Variant for Having the Relation with Supervisors and Turning Over

Model	Total of squares	Option degree	Average of squares	Statistic of test	Meaningful level
Regression	70/994	1	70/994	11/371	0/001
Remainder	2309/963	370	6/243		
Total	2380/957	371			

Table 32: Regression Meaningful Table For Organic Social Factors

Model	Not standard		Standard	T	Meaningful level
Have a relation with supervisors width offset	B	Standard errors	Beta		
	16/970	0/533	-0/173	30/675	0/000
	-0/138	0/041		-3/372	0/001

Table 33: Regression Model Summary

Model	Determined coefficient
1	0/023

Table 34: Analyzing the Handover Variant for Having the Relation with Counterparts and Turning Over

Model	Total of squares	Option degree	Average of squares	Statistic of test	Meaningful level
Regression	54/518	1	54/518	8/671	0/003
Remainder	2326/439	370	6/288		
Total	2380/957	371			

Table 35: Regression Meaningful Table for Having a Relation with Counterparts

Model	Not standard		Standard	T	Meaningful level
Have a relation with counterparts width offset	B	Standard errors	Beta		
	16/822	0/581	-0/151	28/987	0/000
	-0/121	0/041		-2/945	0/003

Table 36: Regression Model

Model	Determined coefficient
1	0/532
2	0/669
3	0/692
4	0/709
5	0/714

Table 37: Analyzing the Handover Variant for Organic Factors and Turning Over

Model		Total of squares	Option degree	Average of squares	Test statistic	Meaningful level
First step	Regression	1266/458	1	1266/458	420/448	0/000
	Remainder	1114/449	370	3/012		
	Total	2380/957	371			
Second step	Regression	1593/136	2	796/568	373/097	0/000
	Remainder	787/821	369	2/135		
	Total	2380/957	371			
Third step	Regression	1647/308	3	549/103	275/431	0/000
	Remainder	733/649	368	1/994		
	Total	2380/957	371			
Fourth step	Regression	1688/691	4	422/173	223/812	0/000
	Remainder	692/266	367	1/886		
	Total	2380/957	371			
Fifth step	Regression	1699/869	5	339/974	182/974	0/000
	Remainder	681/088	366	1/861		
	Total	2380/957	371			

Table 38: The Meaningful Regression for Organic Factors

Model	Not standard			Standard	T	Meaningful level
	B		Standard error	Beta		
First step	Payment system width offset	19/997	0/253		79/150	0/000
		-0/837	0/041	-0/729	-20/505	0/000
Second step	Payment system width offset	21/355	0/239		89/211	0/000
	Distributive justice	-0/564	0/041	-0491	-13/809	0/000
		-0/185	0/015	-0/440	-12/370	0/000
Third step	Payment system width offset	22/013	0/264	-0/440	83/532	0/000
	Distributive justice and proceeding justice	-0/504	0/041	-0/372	-12/280	0/000
		-0/156	0/015	-0/184	-10/111	0/000
		-0/087	0/017		-5/213	0/000
Fourth step	Payment system width offset	20/053	0/491	-0/419	40/859	0/000
	Distributive justice and proceeding justice and job stress	-0/481	0/041	-0/352	-11/935	0/000
		-0/147	0/015	-0/168	-9/749	0/000
		-0/079	0/016	0/140	-4/863	0/000
		-0/034	0/007		4/648	0/000
Fifth step	Payment system width offset	19/367	0/562	-0/412	34/461	0/000
	Distributive justice and proceeding justice, job stress and consistency	-0/473	0/040	-0/340	-11/788	0/000
		-0/143	0/015	-0/173	-9/429	0/000
		-0/082	0/016	0/143	-5/047	0/000
		-0/035	0/007	0/073	4/813	0/000
		-0/047	0/019		2/451	0/015

Table 39: Regression Model Summary

Model	Determined coefficient
1	0/105

Table 40: Analyzing the Handover Variant for Organic Factors and Turning Over

Model	Total of squares	Option degree	Average of squares	F statistic	Meaningful level
Regression	249/925	1	249/925	43/393	0/000
Remainder	2131/032	370	5/760		
Total	2380/957	371			

Table 41: Meaningful Regression Table for Organic Factors

Model	Not standard		Standard	T	Meaningful level
	B	Standard error	Beta		
Organic factors width offset	22/032	1/051		20/959	0/000
	-0/043	0/006	-0/324	-6/587	0/000

Regression Model

While the researcher is going to consider the being meaningful relation between predictive variant and determined variant in the above theory, the regression test has been used that it has been described in the down table.

By noticing to the table 48 and 49, the quantity calculated F (43/393) with option degree 1 and 370 for payment system in the level of Alfa 0/05 is more than the table quantity that it shows the meaningful regression. Because the quantity of t statistic in 0/05 of Alfa level is (-6/587), it is out of zero theory, the theory that is according to be a meaningful relation between organic factors and tending to turn over is accepted. Also by noticing to the table 49, the standard quantity between organic factors as the predictive variant and volunteering turning over as the determined variant is equal 0/324 that this negative quantity shows the reverse relation between two variants. It means by increasing the satisfaction of organic factors, tending to turnover will decrease and by decreasing the satisfaction of organic factors, tending to turnover will increase. Finally, by noticing to the determined coefficient, we can say that 10/5 % of changes in tending to turnover by organic factors are predictable.

 Suggestions

Payment system is one of the most effective factors of organic factors. Although, payment in the governmental part is out of provincial undertakers responsibilities, but following the justice in paying the financial remunerations and overtimes must be noticed. Even the most staff dissatisfactions of the system happen in this manner and the staff tends to turn over gradually. In the distributive justice in the organ, we must have attention to the staff's competence. When the subordinate feels that he can show his competence more than the superior, his obedience of superior will decrease and it may become a reason to encourage the person to leave the organ. In the distributive discussion, in the organ we must pay attention to the people's competence. Because when a down hand person feel that he has a more competence than his upper hand person in doing the tasks, following the roles and obedience will decrease. To the researcher idea, one of the most important points is that we must have justice between stuffs and using the consequent roles for the stuffs in the governmental part. One of the most important factors that the upper hand mangers must pay attention to it is decreasing the job stress of the stuffs. Because by increasing the job stress, turning over will increase. Maybe we can say that versatility in the work place can increase the job stress. Undertaker must not have consistency situation position for the stuffs. Determining the job explanation is one of the job independence aspects. So when the stuff knows his responsibilities, he can do his work as well and he doesn't t mixed up. Upgrading process and increasing system is one of other organic factors. So it is necessary that undertaker have the especial roles for increasing in the organ. Creation the friendly and confident able relation between the stuffs and supervisors is one of the effective organic factors that relates to turning over.

4. Conclusion

In deduction we conclude that the organic factors are the effective factors for turning over and realizing from the organ. Payment system and upgrading process, job independence, distributive justice, proceeding justice, job stress, have relation with stuff and have relation with supervisors have been used as a organic factors in this research. And for determining the each one of them distribution we have used the step by step regression and payment system had the most distribution in turning over by sequence. Therefore we can say that payment system or organic payments to the stuffs have the most distribution in stuff's encountering for staying in the organ. But after payment system, distributive justice and proceeding

justice have the most shares in the organ. We must say that justice can fit the organ but injustice destroys the organ. After payment system, distributive justice and proceeding justice, another two factors which had the effect in the turning over, are job stress and consistency.

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The Relationship Between, Five Factor of Personality (NEO), and Life Satisfaction among Iranian Student (Case Study: Payame Noor University, Lamerd, Iran)

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Abstract: The study aim is to study predict rate of five NEO personality factor and its subscale from life satisfaction (self-satisfaction, life environment, school, friends, family) among students university. With descriptive research method 50 girls and 50 as multi- stage cluster sampling are selected among Lamerd Payame Noor students. They were measured with NEO and Life Satisfaction questionnaires. The result of research is shown that none of the 5 personality factors could predict total satisfaction. But in forecasting subscale life satisfaction by five personality factor was different. Factor conscientiousness and subscales seeking progress, consent from family, pleasant being factor and subscale integrity, consent from friends, Extraversion factor, consent from school, consent from environment and self-satisfaction and pleasant being factor with subscale submission can predicts consent of the individual significantly. Above results showed that negative factor and extraversion factor (positively) could not predict satisfaction from life. The study showed that women are better in each four factor neuroticism, flexibility, extraversion, and conscientiousness. And only in being pleasant factor not find meaningful difference. Research results in field of sex differences can stimulate very questions and researches. The present results can provide very adaptive researches in other social and cultural.

1. Introduction

The study aim is to study predict rate of five NEO personality factor and its subscale from life satisfaction (self- satisfaction, life environment, school, friends, family) among girls and boys students. Past studies examining predicts five personality factors. This research , in addition examining this subject in social and cultural society of Lamer town in regard to girls and boys, sex difference examining subscales five personality factors (including 30 subscale) in predicts life satisfactionand sex differences in this 30 subscale. Each personality factor on scale, five personality factor having six subscales that in past researches have shown less attention to this subscale and from shorted questionnaire form are used more. One of stable finding in field of life satisfaction is powerful relation between life satisfaction and extraversion (positively) and neuroticism (negatively) despite of significant developments remains several questions about relation between personality and satisfaction from life. There are less studies about other personality traits relation and life satisfaction and less studies done for forecasting extraversion rate for other personality traits. In present, it is not evident that do only extraversion and being neurotic is enough for life satisfaction or not? Present research looking at five personality factor and its subscale over life satisfaction. Totally, neuroticisim and extraversion are strong and powerful predict life satisfaction. But neuroticisim and extraversion is a multi- factor structure that is formed small subscales. Depress subscales are from neuroticisim factor and positive excitation subscales and pleasing from extraversion are forecasting life satisfaction. This conclusion also leads to re-adjustment our understanding from special personality traits that interfere in forecasting life satisfaction. For example, depress in forecasting life satisfaction is more important anxiety or nervous and cheerful importance is more than personality, unique and incomparable think and behavior each individual (Wang and Young, 2005). Individual personality manifests with personality traits but traits for each theorist have own special meanings (Wiggins & Lynam, 1991). Traits refer to those personality traits that during time and different condition is stable (Parvin, 2002). Yet this difference, traits theorists are agreed that human behavior and its personality can organizes in a hierarchy (Parvin, 2002). If we are recovered basic personality dimension, in personality psychology will be a reference point. (Mack & John, 1992). In studying this personality dimension, today most researchers concluded that five factor outlines is best practical theory for identifying traits structures

(De Raad & Perugini ,1998). About two decades ago emerge five factor model of personality (FFM) and are changed high statues on researches over normal people personality and society. The most complete version that provided by Costa. & McCrae (1992) for five factor personalities, (NEO-PIR) reviewed questionnaire. Special FFM ability is providing a integrated and collaborative model for comparison and measuring various set from traits in hierarchical structure. From five large personalities factor (FFM) in various and wide sets are used from studies. Researches over sex differences, researches over health psychology, and even kinds and different animal types. FFM in compared to most famous other personalities traits able to providing a integrated descriptive model from personality as abstract that each other personality model can not (Widiger, 2005).

Beginning in the 1990s, personality psychologists concluded that normal individual differences can show in terms of five dimension or tendency, i.e. neurotieism, agreeableness, conscientiousness, extraversion, openness (Mathews, 2003; Chamorro-Premuzie, 2007). However, internal correlation among this factors, especially neurotieism or extraversion and extraversion with openness is unlikely but all this five factor together are formed a complete profile from moral tendencies, stable emotions and cognitive patterns (Chamorro-Premuzie, 2009). People with high extraversion are mostly positive thinking, optimist, inclined to risk, tend to crowd and searching for wonder and amazement, individuals with high conscientiousness are more independent and more capable, meticulous and subtle and responsibility and strong. Individuals that have pleasant feature are sincere, very interested and enthusiastic and interested in others and eager to help others. Person with high neurotieism are relatively unstable, easily frightened is violent, depressed and angry. Theoretical, type-neuroticisim person susceptible to a particular behavior is under social pressure. Flexibility style refers to the ability to accept various experiences and different culture, always express pry and are imagination (Wang & Yang, 2005). In total, five factor model are providing personality theories integrating possibility (Ostendorf & Angleitner, 2004), base of five factor models that include self- report items are according to test experiences - Attitudes - Motivation and individual senses and feelings (Nazir, 2009).

In three stage building, test review, McCrae, & Costa (1992) are arranged questionnaire that attribute to reviewed questionnaire (NEO-PI-R) and measures main five factor in personality. At first, they are emphasized to 3 personality factor: Temperamental neurotic, extraversion, being receptive and are selected NEO personality questionnaire items.

Subsequent, they added also responsibility and compatibility factors to confirm with five factor pattern. In addition, each of this factor divided to six special form, considered forms are shown traits or dimension that are forming 5 personality factors. McCrae, & Costa (1997) are believed to that 5 personality factor structures are universal. Their extensive evidences based on feeling 5 their secular called (NEO- PIR), that are translated to several languages in short time and in fact, same main 5 factors obtained with great discipline. In summary, there are increasing evidences (but also limited) that are shown individual belong to different cultures and various tendencies infers Individual personality characteristics similar to the five main factors..

Life Satisfaction is achievable feeling, such as welfare, luck or same thing about satisfaction from life. Mazloo (1988) is believed that high range from life satisfaction affected different fields such as health, family, leisure, convenience and destiny that individual had during life. The most famous scale life satisfaction (SWLS) recommended by Diner et al., (1985), this scale apply a general measurement for measuring satisfaction thinking from life. Analyzing studies' results have shown that this theory among personality profiles, especially based on 5 NEO personality factors of cheery and un cheery individual and life satisfaction and un life satisfaction, there is difference, are confirmed (Ramanaiah, et al., 1997). In present study with restudying range of forecasting 5 personality factor over satisfaction rate from life in social and cultural environment in Lamerd town, studying range of forecasting subscale 5 personality factors (30 subscale) and sex differences and are following answer to this question that: what relation exists between five personality factor and 30 its subscale and life satisfaction and five its subscale? And what differed exists student girl and boys in five personality factor and satisfaction from life?

2. Literature Review

Yet wide psychometry preceding that are performed for building 16 factor test, serious failure are observed. The first, subjects related to building this test is generally problematic and sometimes paradoxical. Second, some information about its justifiability is providing that measurement many of them is very hard work. Third, most claims related to test performance not confirmed in terms of data validity. This failures is expressed field for providing five NEO personality factor (Laynon, Godashtain et al., 2004). Fiske, 1949 pursuing Kotel studies about ranging personality traits. He applying 21 two- pole scale could access to five mixed factor. After Fiske, scientists such as Tyus and Crystal analyzed previous Kotel works and Fiske associates again and all of them in five acceptable factors called surgery,

agreeableness, dependentability, emotional stability, and culture are found. Norman (1963), Goldber, Digmen and Takomonochok, (1981) and finally Mackcera and Kasta (1985) are pursuing mentioned scientist works until formed five NEO personality factors questionnaire. In three-stage of test building and reviewed , Kasta and Mack Kery arranged questionnaire that have famous reviewed personality questionnaire (NEO- PI-R) and it measure main 5 personality factor. At first, they are emphasized over personality factor: extraversion, being acceptance and are selected NEO personality questionnaire subjects. Its following, responsibility and consistency factor to confirm five factor pattern to it. However, each of these five factors are divided 6 special form, considered forms are shown traits or dimension that forming five personality factor.

Acceptable validity obtained in different resources data such as ranking by husbands or peers Kasta & Mack Kery (1990) supported organized questionnaire performance on personality measurement and criticism Frafken tests and clinical interview because of untidy . evidences shown that both questionnaire is line with five factor measurement tools , such as Goldberg (1992) traits' invoice.

2. 1. Neurotic Idealism:

The most effective personality scales and mutuality is consistency mutuality or emotional stability with inconsistence or Neurotic idealism. Clinical specialists are recognize various cases of emotional worries such as social fear and hostility depress in individual, but countless studies shows that are individual susceptible to one of the emotional conditions , likely experiences other conditions. (Mack Kery & Kousta, 1992). General tendency to experience negative emotions such as fear, sadness, thraw, guilt feeling, and environment set disgust (N) are formed. Howbeit (N) have more than for readiness for Psychological distress. Perhaps brittle emotions prevent consistency. Men and women with (N) score are susceptible illogic beliefs and are less able to control your moves and much weaker the other come along with stress. As the this factor name suggests, patients are recognized as neuroticisim traditionally are obtained high scores in (N) sizes (Aizen, 1966 to quotes from Mack Cery and Kosta, 1992) but (N) scale this test as well as other scales measuring one-dimension healthy personality, high score may Sign up for the possibility of developing some kinds of psychiatric problems but (N) scales should not consider as size and for mental disorders. May obtain a high score on a N scale no associate with a diagnosable mental disorder , on the other word, all mental disorders no associate with high score on N. for example, a person may include anti- social

personality disorder without high score in N. individuals with low scores (N) include emotional stability and are calm, temperate, comfort and are able to encounter with stressful situation without confusion.

2. 2. Extraversion:

Of course wingers out are community-oriented but social ability is only one traits that extraversion scope is proposed, in addition, loving people, prefer large groups and assembles, being intrepid, being active, chatter is also winger out traits. They like gender arousal and also motivation and are tend to pleasing. E scope scales strongly is associate to large risks in jobs. (Koosta, Mack Kery & Haland, 1984). Whatever showing winger out traits is easy as showing introverted traits is difficult. In some descriptions , introversion should consider as lack of extraversion than as anti- extraversion, however introverted individual are self collected than unfriendly. Are independent than follower, same and dominant than lazy and late pleural. When this id in order that these individual preferred to lonely perhaps are said that these individual are chary. Introversion individual not suffer from social stress. Howbeit these individual have extraversion very happy spirit, but they are not pessimistic or not happy. Perhaps, in some cases, Said traits seem strange or unlikely but they measured many studies helps and cause to meaning developments in five factor models (Kousta and Mack kery and Kousta, 1987). These researches led to break mental stereotypes that are connected Mutual characteristics such as happy- not happy-friendly- inimical and socialite and shamefaced together, and are provided new information about personality.

2. 3. Flexibility

As a main dimension personality, flexibility is recognized less E&N in experience. Flexibility elements such as active purpose, felling pretty friendly, attention to internal felling, diversity, Intellectual curiosity and Independence of judgment are played role in theories and personality measures but their affinity seldom are proposed in wide scope and forming factor from personality. Perhaps, flexibility scale in NEQ-PI-PA be wider research dimension (Mack Cerry & Kousta, 1985). Flexible individuals are curious both about internal world and external world and their life is rich in terms of experience. They tend to accept new and anomaly beliefs and they experiences negative and positive anxieties more and deeper non- inflexible individuals. Other five factor models often called these dimension intellect and flexibility scores is associate with training and intelligence scores. Flexibility related to especially with various aspects intelligence such as divergent thinking that is creativity factor (Mack

Kery, 1987). But flexibility is not intellectual synonym. Some intellectual individuals are closed against experience, mutually; some individuals have very finite intellectual capacity flexibility. In the analyzing factor, intellectual capacity sizes are forming sixth factor independent that the authors have taken it out of the area's character. Women and men who take low score in flexibility tend to standard behavior and keeping your view, these individual prefers more familiar newer and their emotional answers is very limited. Although flexibility and inflexibility may applies in form of mental defenses .(Mack Cerry , Kosta, 1992). But there are not evidences that show flexibility only is a generalized defenses response. Unlike, it is seemed to inflexible individuals have simply more limited scope but in interest to area of activity have more consistency. Also, they tend to maintaining social and political, but these individuals should not consider as authoritarian individuals. Flexibility not implicated to intolerance, inimical or aggressive power. These features are sign of nicety degree in very low level.

Mutually flexible individuals are non-traditional and anomaly. They are interested to ask question and are ready to accept new political and social and moral. This trend should not consider such that they are non normative. A flexible individual may answer responsible to your value systems as traditionalist is performing. Flexible individual may be very healthy or more grown but flexible or inflexible value dependent on a situation demands and individuals are performing more effective and useful works in each groups.

2. 4. Being pleasant:

As well as extraversion, primarily, being pleasant is dimension from individual tendencies. A pleasant individual is mainly altruist, He has empathy towards others and eager to help others and believe that other also are helper. Against not pleasant individual is currish, and skeptical to others and competitive than cooperator. People are very willing to being pleasant seen as trait that is socially desirable and psychologically is health, that pleasant individuals are more accepted and honey than currish people, but it should be noted that readiness for fighting against their profits is a score and so being pleasant in battle field or in the court yard not accounted accomplishment, also criticism thinking and skeptic in science help to analyzing science correct. From view point society, none of end pole these factors are not desirable and necessary each of them is not useful about individual mental health (Hoornay, 1945). Hoornaei (1945) discusses about two neuroticisim tendency (move against people) and (move toward people) that they are same being pleasant and currish disease forms. Low score in … associated to

fascination, anti- social and personality disorder while high score in … associated with personality disorder.

2. 5. Conscientiousness:

Some personality theories especially consider mental dynamics to control impulses. During grow period individual should learn to how cope with the dreams and disability in preventing pulses and temptations is signs from high (C) among adults. Self-control also can meaning very active design power, organizing and performing duties is desirable, in these case, individual differences is conscientious . Individual with targeted conscientious is determination and resolve. Successful individual, large musician and athletes called these traits have in high limit. Dygmen and Takomotochook (1981) called this area to trend to success. High score in (C) associated with job and education success. Low score may led to prevent individual from necessary stricture , very attention and cleaning and Being addicted to work. Conscientious is aspect that while called character. Individual with high score in very accurate C are sure and punctual but individuals with low scores in (c) lack of moral doctrine. But in applying moral doctrine not very accurate. Also, they are passive in attempts for access to their purposes. There are evidences that these individual are very pleasure-oriented and are interested to sexuality (Mack Kery and Kousta, and bosch, 1986).

De Raad, et al., (1998) , in quantitative review several European study compared to each other and they concluded that same factors with main five factor are seen in many women, but providing many evidences in confirming accepting experiences – that there is at many dialects. Only several studies are discussed in non- native languages and cultures (Chinies, Japan, Philipini) and show experiences accepting factors- more weak repeatability. Mack Cery and Kasta (1997) believed that five factor personality structures is universal. Wide evidences based on translating five their secular tools called (reviewed personality invoice), that translated to several language in short- time and in fact, same main five factor are obtained with very arrangement. Of course, when researchers native idioms that from language countries studying added to these tools, findings are formed complicated. (Sayer & Goldberg, 1996). In other word, these findings depend on desired traits are imposed to member of a culture and internally its culture take, is different.

In summary, there are evidence of rising (but yet limited) that shown individuals belong to various cultures and different dialects, individual personality traits prefer to main five factors. De Rad and Perugini (1998) concluded that five factor pattern outlines is best practical theory for introducing traits structure.

2. 6. Life Satisfaction:

Life satisfaction is achievable, such as welfare, luck or same thing about life satisfaction (Stickman & Cooper, 1984). Mazloo (1988) believe that high degree from life satisfactionare affected various fields such as health, family, leisure, comfort and destination that individual had during life. Also Edginton (1995) life satisfaction know complex subject for thinking that objective studies only can generalize about it and search for individual satisfaction on economical, physical, emotional affairs. Some studies are shown (Majedi et al, 2006) that high level of social investment more than variables such as job, age and can predict satisfaction of life. Also, (Zandi Pour et al , 2007) there are correlation between life satisfactionand forgiveness and those who passed low over the medium and high enjoy from less satisfaction in life. In total, life satisfaction is a intelligence felling from welfare and completeness.

The most famous life satisfaction scale (SWLS) is proposed by Diner et al (1985). This scale applies a general measure for measurement thinking satisfaction of life. Personality variable and its traits have very vital role in life satisfaction rate in individual. Five factor personality models positively or negatively can predict satisfaction of life (Steel et al, 2008). Produced researches among middle-age and older people shown that life satisfaction with neourtiesim have negative relation and have positive relation with extraversion (Mroczek & Spiro, 2005). Also, flexibility among 5 factors have minimum satisfaction with satisfaction of life (Diener& Lucas, 1999). One of stable finding in field of life satisfaction is powerful relation between life satisfaction and extraversion (positively) and neuroticisim (negatively). Despite of significance developments remains several questions about relation between personality and satisfaction of life. There are less studies about other personality traits relation and satisfaction of life. And also, less studies are performed for rate of forecasting and extraversion for other personality traits. Currently, it is unknown that do only extraversion and neouritism is enough for forecasting satisfaction of life. Current research have close look five personality factor and its subscale over life satisfaction, in general, extraversion and neuroticisim are powerful and strong forcasters satisfaction of life. Subscale depress from neuroticisim factor and subscale of positive anxiety and pleasant from extraversion are more strong anticipant satisfaction of life. This conclusion also lead to re correction our understanding from special personality traits that interfere in predicts satisfaction of life. For example, depress in life satisfaction predicts is important stress or thraw and cheerfulness importance is more than be active sociability. The studies result analyzing shown that this theory that among personality profiles, especially based on five

Neo personality factor , there are difference, are confirmed. (Ramanaiah, et al., 1997). Neuroticisim individual have negative relation with life pleasant events (Schimmack, 2002, Heller). But one of more complete analyze result shown that extraversion positively, neuroticism negatively and conscientiousness positively have relation with satisfaction of life. These results while some other variables such as general and emotional intelligence is weak predict from satisfaction of life (Joukar, 2007).

3. Research Method:

This research discuss relation and rate of variable predict, it is from sub-descriptive group (non-test) and correlation research. In this study sample society include all girl and boy students (3500 students in research performing time) graduating in one of education course on Lamerd payame Noor university. In this research with multi-stage cluster sampling method are selected 50 girls and 50 boys as sample. Reviewed personality questionnaire with measuring five main factor and associated with, 30 traits and features, that is identifying individual personality in field of normality are discussed. Also, Zaki Mohammad Ali life satisfactionquestionnaire are used in order to studying student satisfaction rate. For analyzing data are used from step- step regression, T-test for dependent groups.

4. Research Finding

For answering to this question that five NEO personality factor (neuroticisim, extraversion, flexibility, conscientiousness, cheerfulness) what rate from five factor life satisfaction predicts are used analyzing step- to- step variance. The results shown that (table 1 conscientiousness factor (p< 0/007) and subscale progress (c4) (p< 0/007) can predict satisfaction of life. Cheerfulness factor (p<0/02) and subscale honesty (A2) (p<0/021) can predicts satisfaction of friends. Extraversion and plurality subscales (E2) and activity (E4) can predicts satisfaction of school. Also, extraversion (P<0/32) and subscale (E6) (P<0/004) can predicts life satisfaction environment. Also, extraversion (p<0/02) and activity subscale (E4) (P<0/009) can predicts satisfaction of self- individual. Cheerfulness factor (P< 0/045) with obedience subscale (A4) can predict satisfaction of self- individual (See Table, 1).

The results shown that none of five factors could not predict total satisfaction. For answering to this question that girls and boys what meaningful differences on five personality factor and its subscale and five satisfaction factor of life are used from T- test statistical model for independent groups (See Table, 2).

The T-test results for independent groups shown that girls meaningful in neuroticisim factor (P<0/002) and four its subscale including stress (N[1])

(P<0/015), depress (N3)(P<0/019), timidity (N4)(P<0/012) and vulnerability (N6) (P<0?009) were better than boys that showing more neuroticisim problems girls than boys (Table 3).

T-test results shown that girls meaningful were better in extraversion factor (P<0/034) and activity subscale (E4) (P<0/004) and in remaining subscales had not meaningful difference with each other (Table 4).

T-test results for independent groups shown that girl were better in flexibility factor (P<0<031) and emotions subscale (O^3) (P<0/033) and in remaining subscales had not meaningful difference (Table 5).

The result shown that girl only in kindness subscale (A^6) are obtained less scores than boys and in remaining subscale and cheerfulness factor had not meaningful differences (See Table 6).

The result shown that in conscientiousness scale also girls were better boys (P<0/031). Also, in loyalty subscale (C^3) (P<0/005) and seeking progress subscale (C^4) (P<0/036) also girl scores were better. And in remaining subscales had not meaningful differences together (See Table 7).

The result shown that among five satisfaction factor of life only girls have advantage in life satisfaction than boys and in other four factor , there are not meaningful difference between two groups. Of course girls' advantages in satisfaction of self is very near meaningful (P<0/052) (Table 8).

5. Discussion and Conclusion:

The results shown that none of five personality factor could not predict total satisfaction. But in predicting subscales life satisfactionby five personality factor, results were different. Conscientiousness factor and progress subscale (C4) can predict satisfaction of life. Cheerfulness factor and honesty subscale (A2) can predict satisfaction of friends. Extraversion and plurality subscales (E2) and activities (E4) can predict satisfaction of school. Also, extraversion and subscales (E^6) can predict life satisfaction environment. Also, extraversion and activity subscale (E^4) can predict satisfaction of self-individual. Cheerfulness factor with obedience subscale (A^4) can predict satisfaction of self-individual. Also , the research results shown that extraversion with plurality sub scales and activity can predict satisfaction of school and with activity subscale can predicts satisfaction of self. Conscientiousness with seeking progress could predict satisfaction of family. And cheerfulness with honesty subscale predicts satisfaction of friends and with obedience subscale satisfaction of self. Previous studies stably shown that extraversion positively and neuroticism negatively can predict satisfaction of life. Also, flexibility among five factors have minimum relation with life satisfaction. This is noteworthy in

this study that neuroticism could not predicted significantly rate of life satisfaction and satisfaction subscales (satisfaction of self, family, life environment, school, friend). But agreeable factor with honesty subscale could predict satisfaction of friends.

It should be said in problem explanation that extraversion factors (positively) and neuroticism factor (negatively) can predict satisfaction of total life–unlike some researches, have instead exploring again. But some extraversion subscales, cheerfulness and conscientiousness could predicted some satisfaction subscales, that above results are better confirmation for Schimack et al., (2004), criticism who believe, current studies in field of forecasting traits life satisfaction is incomplete and is in primary stages. The survey results need further investigation and repeat this study in communities to tell other research. Also, research results about sex differences shown that girls were better significantly in neuroticism factor and four its subscale including anxiety (N^1) stress (N^3) timidity (N^6) and vulnerability (N^6) that showing more girls' neuroticism problems than boys. The girls significantly were better in extraversion factor and activity subscale (E^4) and other subscale had not meaningful differences. The girls in flexibility factor and emotion subscale (O^3) significantly were better than boys and the other subscale had not meaningful differences. In being pleasant , girls only in kind (A^6) are obtained less scores than boys and in other subscales and being pleasant had not meaningful differences. In conscientiousness scale also were better than boys significantly. Also, in loyalty subscale (C^3) and seeking progress subscale (C^4) girls' score was better. And the other subscales had not meaningful differences together. The researches shown that about sex differences in personality traits, women were including more neuroticism tendencies, more pleasant, and more extraversion (Lelsi et al , 2007). Generally, in all nations and countries done researches over five NEO large personality factor stably shown that in each five neuroticism, extraversion, pleasant, flexibility and conscientiousness are better than men. (Kasta and Mekaran, 2001; Mackery & Traksyano, 2005; Sachmet et al , 2008). The current research in line with researches shown that women in each four neuroticism, extraversion, pleasant, flexibility and conscientiousness factors are better than men. And only in pleasant factor not seen meaningful difference that showing men and women in interpersonal relations have not meaningful and tangible difference together. This women superiority in each four scale-and women superiority in all five scale in universal researches can motivate very questions and researches.

Table 1: Mechanism Affecting and Dependent Variables over Five Factor Life Satisfaction Including Family, Friends, School, Environment

Dependent variable	Independent variable	B	SEB	β	R2	F	t	Sig
family	conscientiousness	0/096	0/034	0/325	0/105	7/877	2/808	0/007
family	C4	0/409	0/146	0/324	0/105	7/851	2/802	0/007
friends	cheerfulness	0/102	0/043	0/281	0/079	5/723	2/392	0/020
friends	A2	0/338	0/143	0/277	0/077	5/575	2/361	0/021
school	extraversion	0/068	0/033	0/248	0/062	4/398	2/097	0/040
school	E2	0/283	0/115	0/287	0/083	6/030	2/456	0/017
school	E4	0/324	0/121	0/311	0/097	7/158	2/675	0/009
Life environment	extraversion	0/084	0/038	0/259	0/067	4/816	2/194	0/032
Life environment	E6	0/348	0/116	0/346	0/120	9/098	3/016	0/004
Self- individual	extraversion	0/069	0/029	0/279	0/078	5/656	2/378	0/020
Self- individual	E4	0/324	0/121	0/311	0/097	7/158	2/675	0/009
Self- individual	cheerfulness	-0/064	0/031	-0/241	0/133	5/058	-2/047	0/045
Self- individual	A4	-0/270	0/123	-0/260	0/067	4/839	-2/200	0/031

Table 2: Mechanism Affecting Independent Variables over Satisfaction of all Life

Depend variable	Independent variable	B	SEB	β	t	Sig
satisfaction of all life	Extraversion	0/108	0/157	0/107	0/688	0/494
	Neuroticisim	-0/102	0/143	0/064	0/712	0/479
	Being pleasent	0/056	0/162	0/052	0/736	0/730
	Conscientiousness	0/091	0/143	0/100	0/633	0/529
	Flexibility	0/086	0/205	0/068	0/420	0/676
R2= 0/255 F= 0/857 Sig.0/503						

Table 3: Neuroticism Factor:

Total Neuroticisim N	Gender	Number	Average	SD	t	Sig
	girl	50	97/28	14/039	3/225	0/002
	boy	50	85/11	13/408		
Anxiety NI	boy	50	17/40	3/886	2/495	0/015
	girl	50	14/79	3/881		
Hostility N2	girl	50	13/40	4/366	1/174	0/227
	boy	50	12/16	4/746		
Stress N3	girl	50	18/66	4/003	2/684	0/019
	boy	50	16/21	3/119		
Timidity N4	girl	50	18/80	3/720	2/578	0/012
	boy	50	16/37	2/813		
Impulsiveness N5	girl	50	15/08	2/624	0/793	0/383
	boy	50	14/16	4/549		
Vulnerability N6	girl	50	13/94	3/689	2/834	0/009
	boy	50	11/37	3/235		

Table 4: Extraversion

Extraversion E	gender	number	Average	SD	t	Sig
	girl	50	15/556	15/556	2/169	0/034
	boy	50	15/097	15/097		
Heat E1	girl	50	3/833	3/833	0/334	0/728
	boy	50	3/291	3/291		
Plurality E2	girl	50	4/362	4/362	1/105	0/273
	boy	50	4/581	4/581		
Assertiveness E3	girl	50	4/678	4/678	0/494	0/623
	boy	50	3/510	3/510		
Activity E4	girl	50	3/557	3/557	3/211	0/002
	boy	50	3/494	3/494		

Sensation seeking E5	girl	50	4/141	4/141	2/278	0/026
	boy	50	4/441	4/441		
positive motions	girl	50	5/341	5/341	0/811	0/421
	boy	50	4/433	433/4		

Table 5: Flexibility

Flexibility	Sexuality	Num	average	SD	t	Sig
	girl	50	106/24	13/233	2/223	0/031
	boy	50	99/79	9/664		
Fantsy O1	girl	50	16/72	4/912	1/535	0/129
	boy	50	14/84	3/321		
Aesthic O2	girl	50	20/06	4/600	0/006	0/995
	boy	50	20/05	3/808		
Emotions O3	girl	50	17/38	3/129	2/175	0/033
	boy	50	15/63	2/543		
Performance O4	girl	50	15/58	3/764	1/549	0/126
	boy	50	14/05	3/358		
Opinion and ideas O5	girl	50	19/66	3/723	0/552	0/583
	boy	50	19/11	3/755		
Values O6	Girl	50	16/84	2/534	1/068	0/289
		50	1116/	6012/		

Table 6: Cheerfulness

	Sexuality	number	average	SD		t	Sig.
Being pleasant	girl	50	117/82	14/132		1/287	0/208
	boy	50	112/32	16/476			
A1	girl	50	18/46	3/950		0/666	0/510
	boy	50	19/21	4/263			
A2	girl	50	21/06	4/377		0/922	0/374
	boy	50	19/95	4/648			
A3	girl	50	21/50	4/137		1/765	0/086
		50	19/63	3/847			
A4	boy	50	17/82	3/740		0/581	0/566
	girl	50	17/21	3/952			
A5	boy	50	17/52	3/638		0/269	0/790
	girl	50	17/26	3/509			
A6	girl	50	21/26	3/427		2/250	0/032
	boy	50	19/05	3/719			

Table 7: Conscientiousness

	Sexuality	Number	average	SD	t	Sig.
Conscientiousness	girl	50	117/82	14/132	2/207	0/031
	boy	50	112/32	16/476		
C1	girl	50	20/60	3/362	1/503	0/144
	boy	50	19/00	4/150		
C2	girl	50	19/02	4/153	1/497	0/144
	boy	50	17/37	4/072		
C3	boy	50	22/16	3/863	3/048	0/005
	girl	50	18/63	4/450		
C 4	boy	50	20/22	3/716	2/137	0/036
	girl	50	18/89	4/806		
C 5	boy	50	19/26	3/708	1/543	0/127
	girl	50	17/58	4/834		
C 6	girl	50	21/34	4/450	0/543	0/589
	boy	50	19/26	3/588		

Table 8: Five factor of Life Satisfaction:

	Sexuality	Number	Average	SD	t	Sig.
Satisfaction of family	girl	50	31/20	4/928	2/113	0/028
	boy	50	28/35	5/509		
Friend satisfaction	girl	50	38/52	5/932	0/783	0/437
	boy	50	37/40	3/733		
School satisfaction	girl	50	30/76	4/511	0/831	0/409
	boy	50	29/80	3/968		
Environment satisfaction	girl	50	26/78	5/694	0/272	0/787
	boy	50	27/15	3/360		
Satisfaction of self individual	girl	50	24/38	4/179	1/990	0/052
	boy	50	22/65	2/852		

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Radioactivity Measurements and Radiation Dose assessments in Soil of Albaha Region (Saudi Arabia)

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Abstract: The activity concentration and the gamma absorbed dose rates of the terrestrial naturally occurring radionuclides (^{226}Ra, ^{232}Th, and ^{40}K) were determined in soil samples collected from twenty different locations of Albaha region in Saudi Arabia, were performed using a NaI(Tl) gamma-ray spectrometer. The typical concentrations of ^{226}Ra ,^{232}Th and ^{40}K were found in surface soil samples ranged from 30.3±1.6 (sample18) to 45.3±1.9 (sample3) Bqkg^{-1} and from 26.0±1.8 (sample 17) to 37.5±1.8 (sample 18) Bqkg^{-1}and 263.2±6.4 (sample 4) to 434.9±5.4 Bqkg^{-1} sample 13) with overall mean values of 37 Bqkg^{-1},32 Bqkg^{-1}and 343 Bqkg^{-1}, respectively. The mean radium equivalent (Ra$_{eq}$) and outdoor radiation hazard index (H$_{ex}$) for the area under study were determined as 116 Bq/kg and 0.29 respectively. The absorbed dose rate due to three primordial radionuclides lies in the range from 43to 60.3 nGyh^{-1} with a mean of 50 nGyh^{-1}, which yields the annual effective dose of 63 µSvy^{-1} which is well below the permissible limit .The measured values are comparable with other global radioactivity measurements and are found to be save for public and environment .The baseline data of this type will almost certainly be of importance in making estimations of populations exposure.

Key words: Gamma Spectrometry, Annual effective dose, External hazard index.

1. Introduction

The concentrations of the natural radio nuclides,^{238}U,^{232}Th,their daughter products, and ^{40}K, present in the soils, which in turn depend upon the local geology of each region in the world are causes of variation of doses (Radhakrishna *et al.,* 1993 ; Quindos *et al.,* 1994).Estimates of total radiation dose to the world population have shown that about 96% is from natural sources while 4% is from artificial sources (Chougankar *et al.,*2003).The average annual radiation dose to world population is 2.8 mSv, over 85% (2.4mSv) of this is mainly due to natural radiation, since these radionuclides are not uniformly distributed ,the knowledge of their distribution in soil play an important role in radiation protection UNSCEAR (2000) . So, it is felt necessary to study the natural radioactivity in soil to assess the dose to the population in order to know the health risks and to have a baseline for future changes in the environmental radioactivity due to human activities .In particular, it is important to assess the radiation hazards arising due to the use of soil, so, it is necessary to know the rate at which radiation is received and control the radiation hazards .The estimates of the measured radionuclide content have been made for calculating the absorbed dose rate of gamma radiation, the radium equivalent (Req), and the external hazard index (H$_{ex}$),which resulted from the natural radionuclides in soil. Numerous soil surveys have been carried out to test for natural radioactivity in soil at a national scale, and absorbed doses from cosmic radiation and from terrestrial radiation,(see e.g. Tahir *et al.,* 2005;Merdanoglu & *Altinsoy,2006*; Rohit *et al.,* 2007; Jabbar *et al.,* 2010;Baozhu&Yongfeng 2011;;Ahmad *et al.,* 2011). Such data can be used to establish if and where local controls are needed, also enrich the global data bank on radioactivity that will allow a more accurate estimation of global average values of dosimetric quantities.

The primary objective of the present study was to determine the natural radioactivity of ^{226}Ra, ^{232}Th and ^{40}K in soil samples of Albaha region in Saudi Arabia, where in this region, the population is associated with agriculture. Therefore, knowledge of the activity concentration levels of naturally occurring radionuclides in soils is essential for an accurate assessment of possible radiological risks to human health in this region. In addition, assessment the resultant radiation doses to the population to provide baseline data can be beneficial to the protection of local people's living environment and enlightens the local radiation regulation making.

Location of Study Area

This study was carried out at Albaha region, this area is located south-west Saudi Arabia, which lies on Longitude 41°, 42 east and latitude 19°, 20 north. Albaha region is surrounded by mountains, populated by a variety of plants, divided in Two parts,Tehamma and Alhejaz,from the villages of Alhejaz, agricultural soil samples have been collected and there is no information about radioactivity in the soils samples so far.For this reason, the concentrations of the

natural radionuclides in soil samples from 20 different sampling stations in Albaha region have been determined. The geological map of the study area in Fig 1.
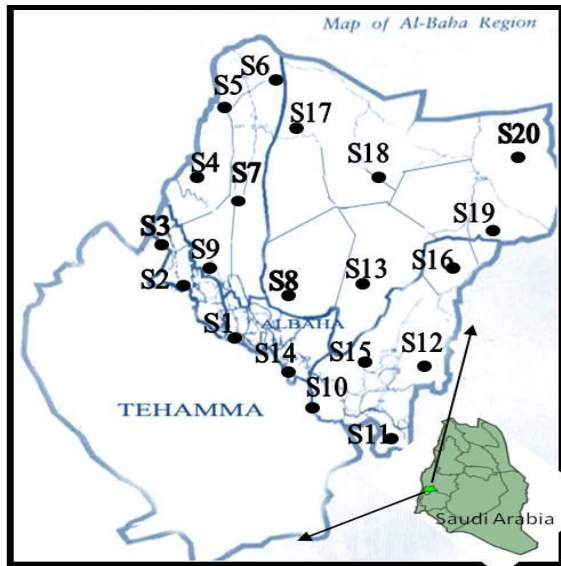
Fig(1). Location map of Albaha region

2. Materials and Methods

In order to measure the natural radioactivity in agricultural soil , surface soil (about 0-5 cm) sample were collected using hand auger from the highland agricultural farm area in twenty locations of Albaha region .Each sample was taken with a coring tool within area of 1 m^2 ,five cores were taken for each sample, one in the middle and four cores from the corner, these samples were then mixed to make a single sample after removing top layer of vegetation and roots.To get moisture free samples ,they were dried in an oven at 110°C for 24 hours until constant dry weight (Benke and Kearfott, 1999;Veiga *et al.,* 2006). The dried samples were crushed and allowed to pass through micro sieves to maintain the homogeneous grain size soil sample for the measurement (IAE, 1994). About 500g of the homogenized soil samples were transferred into cylindrical containers. They were carefully sealed and stored for at least 30 days before gamma ray analysis was performed to allow radioactive equilibrium among the daughter products of radon (^{222}Ra) and thoron (^{220}Ra) and their short- lived decay products (Mollah *et al.,*1987).The activity concentrations of ^{226}Ra,^{232}Th and ^{40}K for all homogenized and equilibrium samples were measured by a gamma ray spectrometry using a NaI (TI) detector 3x3 inch with a 1024 - chanel computer analyzer. The detector has a peak efficiency of 1.2x10^{-5} at1332.5Kev Co-60 and an energy resolution (FWHM)of 7.5%for 662kev,

detector employed with adequate lead shielding which reduces the background radiation. The specific activity of ^{226}Ra was evaluated from gamma-ray lines of ^{214}Bi at 609.3, 1120.3 keV and ^{214}Pb at 351 keV, while the specific activity of ^{232}Th was evaluated from gamma-ray lines of ^{228}Ac at 338.4, 911.1 and 968.9 keV.The specific activity of ^{40}K was determined directly from its 1460.8 keV gamma-ray line. Activity calculations have been carried out using the procedure given by (Lalit and Ramachandra, 1980), the activity concentrations in each sample were evaluated using the following equation:

A$_c$ (^{A}x) = C/(m T P$_c$ ξ)   ---------- (1)

where A$_c$(^{A}X) is the activity concentration of the radionuclide ^{A}X (Bq kg^{-1}) in the sample, C   the count rate obtained under the corresponding peak , m the sample mass (kg),T is the counting time(s),P$_c$ the emission probability, and ξ is the detection absolute efficiency at a specific energy.

Assessment of radiation Hazard indices from the soil .

The concentration and distribution of ^{40}K,^{226}Ra,and ^{232}Th in soil is not uniform throughout the world, so to represent the activity concentrations of ^{226}Ra ,^{232}Th and ^{40}K by a single uantity, taking into account the following radiological radiation hazard associated with them , absorbed dose rate D$_R$ (nGyh^{-1}) in air , annual effective dose equivalent D$_{eff}$(mSvy^{-1}), radium equivalent activity Ra$_{eq}$ (Bq kg^{-1}),and external hazard index H$_{ex}$ (Bq kg^{-1}).

To assess the real activity level of ^{226}Ra, ^{232}Th and ^{40}K in soil ,acommon radiological index has been defined in terms of radium equivalent activity (Ra$_{eq}$) in Bq kg^{-1} can be used , provides a very useful guideline in regulating the safety standards in radiation protection for a human population . The index was calculated through the following relation (Beretka and Mathew, 1985):

Ra$_{eq}$ (Bqkg^{-1}) = C$_{Ra}$ + 1.43C$_{Th}$ + 0.077C$_K$ …. (2)

The formula is based on the assumption that 370 Bq kg^{-1} of ^{226}Ra, 259 Bq kg^{-1} of ^{232}Th and481 Bq kg^{-1}of ^{40}K produce the same gamma-ray dose rate (Stranden 1976).Avalue of 370Bqkg^{-1} coresponds to 1 mSv y^{-1}.

To limit the annual external gamma-ray dose to 1.5mGy/y for the samples under investigation , the external hazard index is given by the following equation(Beretka and Mathew, 1985):

H$_{ex}$ = C$_{Ra}$/370 Bq kg^{-1} +C$_{Th}$ /259 Bq kg^{-1} + C$_K$ /4810 Bq kg^{-1} …….(3)

where C$_K$,C$_{Ra}$ and C$_{Th}$ are the activity concentrations (Bq kg^{-1}) of the specific radiation. The maximum value of H$_{ex}$ to be less than unity corresponds to the upper limit of Ra$_{eq}$ (370Bqkg^{-1}).

The absorbed gamma dose rates D$_R$ (nGyh^{-1}) in air at 1m above the ground surface for the uniform

distribution of radionuclides were calculated based on guidelines provided by UNSCEAR 2000:

D_R (nGy h^{-1}) = $0.427C_{Ra} + 0.623C_{Th} + 0.043C_K$ (4)

where C_K, C_{Ra} and C_{Th} are the activity concentrations (Bq kg^{-1})of ^{40}K, ^{226}Ra and^{232}Th, respectively, in the samples.

The annual effective dose equivalent was calculated from the absorbed dose by applying the dose conversion factor of 0.7 SvGy^{-1} with an outdoor occupancy factor of 0.2 (UNSCEAR, 1993, 2000) :

D_{eff}(mSvy^{-1}) = D_R (nGyh^{-1}) ×8,766 h × 0.7(SvGy^{-1})× 0.2×10^{-6} .... (5)

where 8,766 h is the number of hours in 1 year . 10^{-6} is conversion factor of nano and milli.

3. Results and discussion

The activity concentrations of ^{226}Ra ,^{232}Th and ^{40}Kradionuclides in soil samples collected from different locations of the studied area of Albaha region are presented in Table(1).The activity concentrations of ^{226}Ra in the soil ranged from30.3±1.6 (s. 18) to 45.2±1.9 (s. no.3) Bq.kg^{-1} with a mean 37 Bq.kg^{-1}, ^{232}Th ranged from 26.0±1.8 (s. no.17) to37.5±1.8 (s. no.18) Bqkg^{-1} with a mean of 32 Bq.kg^{-1} and ^{40}K ranged from 263.2±6.4 (s. no.4) to 434.9±5.4 (s. no.13) Bq.kg^{-1} with a mean of 343 Bq.kg^{-1}, respectively. This shows that the largest contribution to the total activity coms from ^{40}K in the study region. The average activity concentrations of terrestrial radionuclides^{226}Ra ,^{232}Th and^{40}K are within

the world wide average concentrations of these radionuclides reported by UNSCEAR (2000) as 35, 30 and 400 Bq kg^{-1}, respectively.

It is interesting to compare the mean concentration of natural radioactivity of Albaha region soil with the results for different countries of the world, as shown in Table(3).The comparison of the ^{226}Ra with that of the worldwide shows that, seven countries have higher values and eight have lower values activity concentration of this radionuclide than in the soil of the understudy region. It is found that the mean value of ^{232}Th in the present study was higher than reported for soils of Turkey, South Jordan, Syria, Algeria, Egypt and Iran, but it is found that it is less than reported for Pakistan, India,China,Yemen and Nigeria. The mean value of ^{232}Th was found nearly the same as reported for Spain, Japan and United States. The comparison of ^{40}K activity concentration shows that the values of this radionuclide in the soil of China, Yemen, Iran and Egypt/Qena are higher than the present study mean value ,all other countries in comparison with the present study of Albaha region have a comparable activity concentration values.The variations in the concentrations of the radioactivity in the soil of the various locations of the world, depend upon the geological and geographical conditions of the area and the extent of fertilizer applied to the agreiculture lands (NCRP 1975, UNSCEAR , 2000 &Tzortzis *et al. ,* 2003) .

Table (1): The values ^{226}Ra ,^{232}Th and ^{40}K activity content ,radium equivalent activity (Ra$_{eq}$) and External hazard index(H$_{ex}$) in the soil samples from Albaha region.

Sample location	Radioactivity concentration(Bqkg^{-1})			Ra$_{eq}$ (Bq/kg)	External hazard index (H$_{ex}$)
	^{226}Ra	^{232}Th	^{40}K		
S1	38.5±2.4	33.2±1.7	359.4±6.2	121.1	0.31
S2	30.4±2.1	33.6±1.9	376.4±6.7	102.9	0.29
S3	45.2±1.9	35.3±1.6	275.7±6.8	130.9	0.32
S4	36.9±2.0	30.9±1.9	263.2±6.4	110.0	0.27
S5	34.1±1.8	26.7±2.0	275.5±6.1	104.0	0.25
S6	40.7±2.3	36.7±1.7	317.6±7.7	123.1	0.32
S7	32.2±1.6	32.1±1.9	297.6±6.1	101.0	0.27
S8	34.2±2.3	26.9±1.8	374.7±6.6	111.9	0.27
S9	35.1±1.7	31.3±1.5	280.4±8.1	106.9	0.27
S10	43.8±2.3	29.5±2.1	312.7±6.1	130.5	0.30
S11	39.8±1.6	31.7±1.7	410.8±6.6	128.5	0.32
S12	41.3±3.2	33.9±1.5	357.7±6.9	128.0	0.32
S13	43.6±1.9	36.9±1.8	434.9±5.4	139.4	0.35
S14	42.9±3.0	32.6±2.1	361.1±8.0	131.9	0.32
S15	32.4±1.7	29.2±1.6	343.2±7.2	105.1	0.27
S16	44.2±1.8	34.7±1.7	336.7±6.2	133.2	0.32
S17	29.6±1.8	26.0±1.8	402.4±6.0	102.9	0.26
S18	30.3±1.6	37.5±1.8	380.7±5.7	102.9	0.31
S19	31.2±2.5	27.6±1.7	351.9±6.9	102.8	0.26
S20	32.4±1.5	29.6±1.9	353.5±7.2	105.9	0.28
Min.	30.3±1.6	26.0±1.8	263.2±6.4	101	0.26
Max.	45.2±1.9	37.5±1.8	434.9±5.4	139	0.32
Mean	37	32	343	116	0.29

The radium equivalent activity Ra_{eq} provides a basis for comparing the activity concentrations of ^{226}Ra, ^{232}Th, ^{40}K, in soils so as to obtain the total radioactivity (Eq. 2).The results displayed in Table (1) show Ra_{eq} values varying from 101(s.no.7) to 139 (s. no.13)Bq kg^{-1}with a mean value of 116 Bqkg^{-1}. These values are lower than the permissible maximum value of 370 Bq kg^{-1} (NEA-OECD, 1979; UNSCEAR,1988). Also, external hazard indices calculated for soil samples are presented in Table (1).The values of outdoor radiation hazard index(H_{ex}) varies from 0.26(s.no.17) to 0.35(s.no.13) with a mean value of 0.29,which all values are less than the critical value of unity. Therefore ,based on these results of radium equivalent activity and external hazard indices, one can conclude that there is no health hazard from the soil of Albaha region as for as gamma radioactivity is concerned. The calculated total absorbed dose and annual effective dose rates of samples are tabulated in Table(2). It is observed that the total absorbed dose rate calculated from activity concentration of ^{226}Ra ,^{232}Th and^{40}K in air ranges between 12.7(s.no.17)to 19.3 (s.no.3) , 16.2 (s.no.17) to 23.4(s.no.18) and 11.3 (s.no.4) to 18.7(s.no.13) nGyh^{-1} with a mean value of 16 ,20 and 15 nGyh^{-1} , respectively. The total absorbed dose in the study area ranges from 43 to 60.3 nGyh^{-1} with an average value of 50 nGyh^{-1} ,which is lower the limits as recommended by ICRP (1993) .The relative contribution to dose due to ^{40}K was 29%, followed by the contribution due to ^{226}R and^{232}Th as31% ,40%, respectively. Concerning world average value determined by UNSCEAR 2000 (32%,36%,32%), respectively.

The annual effective dose equivalent from outdoor terrestrial gamma radiation ranged from 55 to 76 μSvy^{-1} with a mean value of 63 μSvy^{-1}.This is comparable to the world average value of 70μSvy^{-1} for outdoor terrestrial radiation for region of normal radiation background (UNSCEAR , 1993) .Therefore, the study area is still in the zones of normal radiation level , which leaves the soil radioactivity there less a threat to the environment as well as the human health.

Table(2): Air- absorbed dose rates and annual effective doses calculated for surface soil samples collected from Albaha region

Sampels no.	Absorbed dose (nGyh^{-1})				Annual effective dose(μSvy^{-1}) D_{eff}
	^{226}Ra	^{232}Th	^{40}K	Total (D_R)	
S1	16.4	20.7	15.5	52.6	65
S2	12.9	20.9	16.2	50.1	61
S3	19.3	22.0	11.9	53.1	67
S4	15.8	19.2	11.3	46.3	58
S5	14.5	16.6	11.9	43.0	55
S6	17.3	22.9	13.7	53.9	67
S7	13.7	20.0	12.8	46.5	57
S8	15.0	16.8	16.1	47.5	60
S9	15.0	19.5	12.1	46.5	58
S10	18.7	18.4	13.4	50.5	65
S11	17.0	19.7	17.7	54.4	69
S12	17.7	21.1	15.4	54.1	68
S13	18.6	23.0	18.7	60.3	76
S14	18.3	20.3	15.5	54.1	69
S15	13.8	18.2	14.8	46.8	58
S16	18.9	21.6	14.5	55.0	70
S17	12.7	16.2	17.3	46.1	57
S18	12.9	23.4	16.4	52.7	63
S19	13.3	17.2	15.1	45.6	57
S20	13.8	18.5	15.2	47.5	59
Range	12.7-19.3	16.2-23.4	11.3-18.7	43 - 60.3	55-76
Mean	16	20	15	50	63

Table(3): Comparison of natural radioactivity concentration (Bqkg^{-1}) in the soil Samples and dose rates for present study with previous study reported from different countries of the world

Country	Mean activity concentration (Bqkg^{-1})			Average dose rate(nGyh^{-1})	References
	^{226}Ra	^{232}Th	^{40}K		
Turkey	21.0	23.5	363.5	40	Ridvan *et al.* (2011)
Pakistan	42.11	43.27	418.27	54	Hasan *et al.* ,2011
India	57	87	143	85	Singh *et al.* (2005)
China	22.1	39.0	859.1	62	LuXinwei (2006)
South Jordan	42.5	26.7	291.1	52	Ibrahim *et al.* (2009)
Syria	19	24	336	37	Al-Masri *et al.* (2006)
Yemen	44.4	58.2	822.7	90	El-mageed *et al.* (2011)
Nigeria	54.5	91.1	286.5	95	Oladele (2009)
Algeria	50	25	370	54	UNSCEAR, 2000
Egypt (Qena)	13.7	12,3	1233	65	Ahmed et al(2005)
Spain	32	33	470	76	UNSCEAR, 2000
Japan	33	28	310	53	UNSCEAR, 2000
Iran	28	22	640	71	UNSCEAR, 2000
United State	40	35	370	56	UNSCEAR, 2000
World average	30	35	420	65	UNSCEAR, 2000
Present study	37	32	343	50	

Table(3) shows a comparison of total absorbed dose rate in air found in the present study with values reported in literature for some other countries of the world .The average outdoor absorbed dose rate in air determined in the present study is nearly similar to the values reported for Pakstan ,South Jordan, Algeria ,Japan and United States, but lower than the values reported for Egypt, *India ,China ,Yemen ,Nigeria ,Spain ,I*ran *and the* world average (65Bqkg^{-1}) as shown in Table (3).However, the values found in the present study are somewhat higher than the values reported for Turky ,Syria . Activity concentrations of ^{226}Ra,^{232}Th and ^{40}K and Radium equivalent with total absorbed dose in the present study are shown in Fig(2)and Fig(3) respectively.
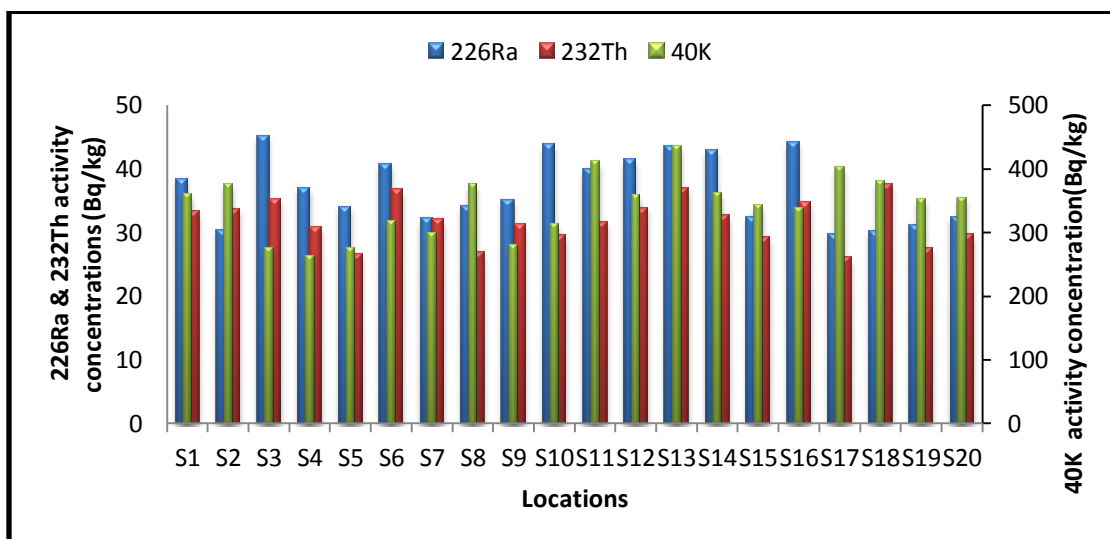
Fig(2) Activity concentrations of ^{226}Ra,^{232}Th and ^{40}K in soil of Albaha region
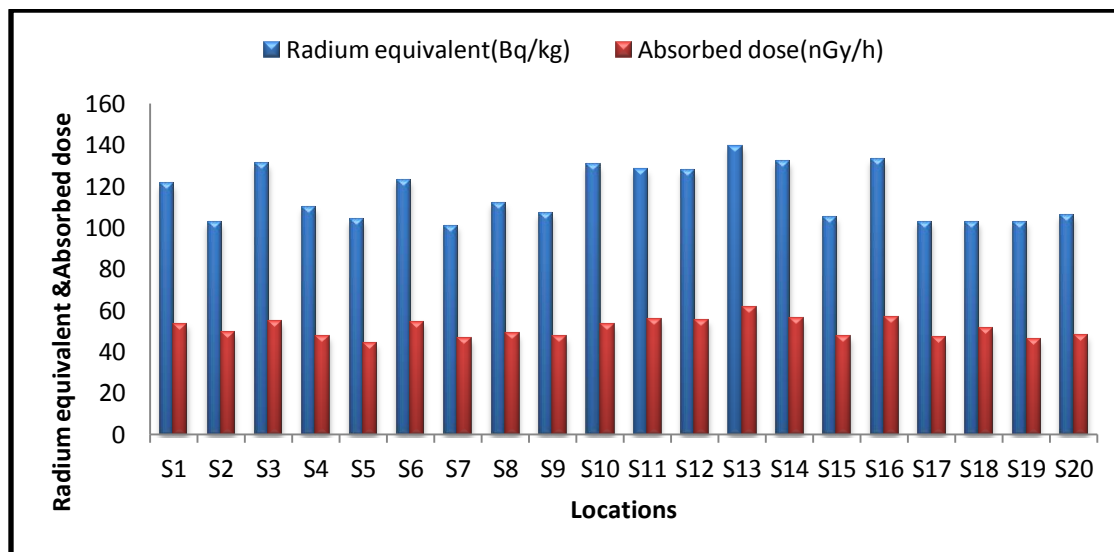
Fig.(3).Radium equivalent and Absorbed dose rate in soil samples

Conclusion

From this study, the mean activity concentrations for ^{226}Ra and^{232}Th and ^{40}K are Bqkg^{-1} ,37 Bqkg^{-1} , 32 and 343 Bqkg^{-1},respectively.Overall ,the study showed that the measured values lower than, in the world wide soil. The mean value of total absorbed dose rate is 50 nGy/h, which is below the corresponding population-weighte(world average) value of 65nGyh^{-1}.The mean value of the annual dose 63 μSv, which is less than the average value recommended by UNSCEAR (1993).The value of Ra$_{eq}$ activity was found to be less than 370 Bqkg^{-1},the external hazard indices were found to be less than acceptable limit of unity. Therefore, the study area is still in the zones of normal radiation level, which leaves the soil radioactivity there less a threat to the environment as well as the human health. However, this data may provide a general background level for the area studied and may also serve as a guideline for future measurement and assessment of possible radiological risks to human health in this region.

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Therapeutic Efficacy of Herbal formulations for Recurrent Aphthous Ulcer. Correlation with Salivary Epidermal Growth Factor

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Abstract: Background: Recurrent aphthous ulceration (RAU) is one of the most common oral mucosal lesions seen in primary care. Epidermal growth factor(EGF) in saliva is cytoprotective against injuries and plays a role in maintaining the mucosal integrity and promoting wound healing. This study compared the efficacy of three herbal components in the management of RAU and correlated this effect with salivary epidermal growth factor levels. **Methods:** Forty patients with minor aphthae were selected and randomly divided into four groups. The first three groups received topical preparations of *Acacia nilotica* (A), Glycyrrhiz glabra orLicorice (L) and a mixture of *Acacia nilotica* and Licorice (A&L).The fourth group (negative control) used a placebo. Ulcer size, pain score and salivary EGF level were recorded on treatment days 0, 2 and 5. **Results:** At day zero, there was no statistically significant difference between the four groups regarding pain score, ulcer size and salivary EGF level. At days 2 and 5, there was no significant difference between Group A and control groups; both showed the highest mean pain scores($P \leq 0.05$). Group (A & L) showed the lowest mean pain score and ulcer size, followed by group L. At the same observational period, both of (A & L) and (L) groups showed the highest mean EGF values. This was followed by Group (A). Control group showed the lowest mean EGF value..**Conclusion:** Treatment of minor aphthae using a mixture of Licorice and *Acacia nilotica* extracts revealed improved pain reduction and healing potential than each substance alone. These results correlated positively with salivary EGF levels measured during the same observational periods. **Conclusion:** There is an evidenced association between gastric affection and salivary *H. pylori* detection that even exceeds stool detection of *H. pylori* antigen. Moreover, continuous evaluation of antibiotic susceptibility should be carried out and clinicians should be aware about it to select the appropriate empiric regimen for *H. Pylori* eradication.

Key words: Medicinal plants; *Acacia nilotica*; Licorice; Aphthous ulceration; Epidermal growth factor**.**

1. Introduction

Recurrent aphthous ulceration (RAU) is the most common oral disease affecting 5-25% of the general population worldwide and is amongst the most prevalent and complicated disorders of the oral cavity (1). Several initiating factors have been implicated in the pathogenesis of RAU (2), however their role as the main etiological factors in the pathogenesis remains to be elucidated. Furthermore, with the dramatic worldwide increase in patients with immuno-suppression caused by medical treatments, systemic diseases, or both, the prevalence of RAU may be increasing (3).

The treatment of RAU still remains nonspecific and is based primarily on empirical data. The goals of therapy include the management of pain and functional impairment by suppressing inflammatory responses, as well as reducing the frequency of recurrences or avoiding the onset of new aphthae (4). Antibacterial, anti-inflammatory and anti-histaminic agents, analgesics, local anesthetics, and glucocorticoids have been used topically to manage RAU. Most of these therapies are associated with side effects or unwanted reactions (5).

Epidermal growth factor (EGF), also known as epithelial growth factor is the founding member of the EGF family of proteins. It is an amino acid peptide that is present in a variety of biologic fluids including saliva, and is also present in the mucosa lining the whole human digestive tract (6). EGF stimulates the division and proliferation of cells of various tissues including the oral epithelial cells (7). It plays an important physiological role in the maintenance of esophageal and gastric tissue integrity by aiding in the healing of oral and gastroesophageal ulcers, inhibition of gastric acid secretion, stimulation of DNA synthesis

as well as protection of the mucosa from injurious factors (8). Preliminary studies assessing the role of EGF on mucosal healing have been conducted. Low salivary EGF levels have been observed in patients with various forms of oral mucosal disease (9), suggesting an important role for salivary EGF in maintaining the integrity of oral epithelium (10).

There has been a substantial increase in the use of natural products including medicinal plants in primary health care. Phytochemical progress has been aided enormously by the development of rapid and accurate methods of screening plants for particular chemicals essential for the development of novel therapeutic agents that are safer and could be effective in the treatment of human diseases (11). Few medicinal herbs are listed as anti-aphthous agents. Quercetin, a plant flavonoid, has been shown to be effective in the treatment of RAU due to its structural similarity and functionalities with disodium cromoglycate (12). Zulene compounds found in several plant species, such as Anthemis nobilis and Matricaria recutita are reported to possess anti-allergic, anti-inflammatory and mild antibacterial activities. *Anthemis nobilis* is used for washing the mouth wounds and external use of Matricariarecutita is approved for mucous membrane inflammations including those of the oral cavity and gums (13).

Acacia nilotica willd L (subsp. Nilotica) belongs to Family Fabaceae, subfamily Mimosoideae. Previous phytochemical investigation of the genus Acacia resulted in the isolation of several types of chemical constituents including alkaloids, cyanogenic glycosides, gums, amino acids, terpenes, flavonoids saponins, mucilage and tannins (14). *Acacia nilotica* (A nilotica) has a potent antimicrobial activity, as it was demonstrated that the MDR strains of bacteria and fungi were sensitive to the antimicrobial activity of *Acacia nilotica*, whereas they exhibited strong resistance to the other tested plant extracts (15). *Acacia nilotica* mouth rinse showed effective antibacterial effect against halitosis inducing bacteria on the tongue (16), and is also used in the treatment of gingival bleeding and mouth ulcers (17).

Glycyrrhiz glabra (Licorice) also known sweet wood, family Leguminosae, contains several bioactive compounds including a water-soluble biologically active complex that accounts for 40-50 % of the total dry material weight. The beneficial effects of licorice can be attributed to a number of mechanisms. Glycyrrhizin and glycyrrhizic acid have been shown to inhibit growth and cytopathology of numerous RNA and DNA viruses, including herpes zoster and herpes simplex (19, 20). Licorice constituents also exhibit steroid like anti-inflammatory activity, similar to the action of hydrocortisone. This is due, in part, to inhibition of phospholipase A2 activity,

an enzyme critical to numerous inflammatory processes. (21) *In vitro* research has also demonstrated glycyrrhizic acid to inhibit cyclooxygenase activity and prostaglandin formation (specifically prostaglandin E2),as well as indirectly inhibit platelet aggregation and all factors in the inflammatory process (21).

Glycyrrhizin has been used systemically for the treatment of chronic hepatitis C and oral lichen planus (OLP). In an open clinical trial, 17 hepatitis C-positive patients with OLP were given either routine dental care or 40 ml IV glycyrrhizin daily for one month. Among nine patients taking glycyrrhizin 66.7% noted improved clinical symptoms, such as decreased redness, fewer white papules, and less erosion of the mucosa. In the non-glycyrrhizin group of eight patients, only one (14.3 %) reported any improvement (22).

Concerning its topical use, a case report demonstrated a 2 % topical glycyrrhizic acid cream (carbenoxolone sodium) applied six times daily in 12 patients with acute oral herpetic infections resolved pain and dysphagia within 24-48 hours. Moreover, the accompanying ulceration and lymphadenopathy gradually healed within 24-72 hours (23). When Glycyrrhiz glabra was used as a mouth rinse, it had a significant effect on reducing plaque and gingivitis (24). As regards the effect on RAU, the use of the oral licorice mouthwash significantly reduced the average number of ulcers per day, pain scores, and the development of new ulcers (25). In another study of 20 RAU patients who were instructed to use de-glycyrrhizinated licorice mouthwash four times daily, fifteen patients experienced 50-75 % clinical improvement after only one day of using the mouth wash, with complete healing of canker sores after three days (26).

2. Materials and methods
Plant material
1.Extraction of herbal actives from *Glycyrrhiz glabra* and *Acacia nilotica*

Medicinal plants were selected on the basis of their bioactive constituents, supportive reports and traditional uses. Leaves and pods of *A. nilotica* willd L and roots of Licorice were collected from Upper Egypt. Identification of the plant was confirmed by Prof. Dr. Laila Boulos, National Research Center, El-Tahrir Str., Dokki, Cairo, Egypt and compared with reference to herbarium specimens. Voucher Specimens were kept in the herbarium of the National Research Center.

Dried roots and rhizomes of *Glycyrrhiz glabra* and *Acacia nilotica* were extracted separately by the continuous extraction technique in succession using solvents with increasing polarity. The polar extracts were collected and investigated, using

chromatographic and spectral methods; PC, CC, TLC, Preparative HPLC, LC/MS, High field NMR, 1H-NMR, (13) C-NMR (24), HMBC, HMQC, H1H1-COSY, ESI-MS (27), then lyophilized and saved for pharmaceutical preparation. The powdered air-dried pods of *Acacia nilotica* and roots of licorice were defatted with CHC13 (3 x 3 L) and extracted with MeOH-H2O (7:3, 5 x3 L) at room temperature. The combined extracts were filtered, evaporated under reduced pressure and lyophilized (200 g). Twenty grams of the dry residue were used for the biological study.

Preparation and characterization of herbal adhesive pastes

The pastes were prepared previously by heating weighed mixtures of polyethylene glycol, extract, glycerine and distilled water at 70 º C then adding these aqueous components to the oily component made of sodium carboxymethyl cellulose, pectin and liquid paraffin heated to the same temperature. This was followed by the addition of tween 20 and mixing till obtaining a smooth homogeneous texture. The contents of glycyrrhizic acid and condensed tannins in liquorice and Acacia containing pastes, respectively, and in the pastes containing mixture of both extracts, were determined by spectrophotometric analyses (28). The herbal extracts were included in 2% composition of the formulations regarding single herb formulae and 1% of each herbal extract in the mix formula. The prepared pastes were exposed to storage at room temperature and at 40 °C for 2 months, where visual examination of physical aspects together with chemical analysis of active ingredients in the herbal pastes were conducted at zero time and after 2-months storage.

Patients and methods:

A total of 40 patients, 13 females (43.3%) and 17 males (56.7%) with mean age 26.5 years (18-35 years) and a current history of RAU were recruited from the patients attending at the Oral Medicine Clinic, College of Oral & Dental Surgery, Misr University for Science & Technology (MUST). The eligible subjects were informed regarding the purpose of this study. Before entering the study, each of them provided a signed consent to participate in this study. The protocol was approved by National Research Center Ethical Committee.

Only RAU cases with a history of at least two confirmed episodes of RAU during a 3-6 months non-treated baseline period were included in the present study. Exclusion criteria included patients with iron deficiency, inflammatory and allergic conditions, psychological disturbance, history of medication, smoking, pregnancy, wearing dentures, receiving antibiotics for RAU or those with special syndrome

where aphthous ulcer is one of its symptoms (e.g. Behcet's syndrome); those with aphthous lesions older than 4 days, patients subjected to any other treatment for at least 4 weeks before the beginning of the study.

Study design

Subjects were instructed to contact the Research Study Coordinator at the first signs of an aphthous ulcer, at which point they were scheduled immediately for a screening session. Subjects satisfying the inclusion criteria were assigned randomly to one of the four-treatment groups namely Acacia nilotica (A), Licorice (L), Acacia &Licorice (A&L), and control group. Patients of each groups received herbal preparations formulated as muco-adhesive pastes and were instructed to apply the medication four times on the lesions after drying the tissues with a small sterile cotton pad and refrain from eating at least for 30 min after the drug application. Patients were examined for ulcer size, pain score and salivary EGF levels on treatment days 0, 2 and 5. Pain was recorded using the visual analog scale (VAS), which consists of a 10 cm line anchored by two extremes: no pain and pain that could not be more severe. Patients were asked to make a mark on the line representing their level of perceived pain (29).The size of the ulcer was measured with a Williams graduated periodontal probe that was held close to the photographed ulcer to calibrate measurements and determine the dimensions of the ulcer. A colored print of the image was used for subsequent analysis of size. Lesion dimensions were determined by a single oral medicine specialist who was blinded to the subject's status. The white ulcerous region of the lesion was outlined using a 0.5 mm medium lead pencil. The long axis of an ellipse across the ulcer was designated as the major axis length, while the minor axis was designated as the widest spot of the lesion perpendicular to the major axis. The length of each axis was measured on the photograph with a digital caliper and the length was corrected (to the nearest 0.5 mm) against the image of the periodontal probe (30).

Saliva collection

About 5 ml sample of whole unstimulated saliva (drool) was collected from each participant by the simple drooling method while sitting, where saliva was allowed to drip off the lower lip into calibrated tubes according to Wu-Wang *et al.* (40). Each sample was chilled was ice and then transferred to the laboratory, where saliva was thawed, centrifuged at 3000 rpm to remove any debris, diluted with phosphate buffer saline and stored at -70° C until required for analysis(41).

Measurement of EGF

Quantitative analysis of EGF was done using the DRG Human EGF ELISA (hEGF) kit (DRG International Inc., USA) which employs a competitive

protein binding technique in which a biotinylated – hEGF competes with unlabeled h EGF for a limited number of specific antibody binding sites immobilized to the polystyrene wells. The percentage of antibody bound biotinylated –hEGF decreases as a function of increasing unlabeled hEGF. The biotin groups are then determined by incubation with a streptavidin-horseradish peroxidase and subsequent color development. Absorbance which is inversely proportional to hEGF concentration, is measured with a suitable spectrophotometer. H EGF in samples is determined by comparison with a standard curve prepared with a series of h EGF samples of known concentration.

Statistical analysis

Data were presented as mean and standard deviation (SD) values. One-way Analysis of Variance (ANOVA) was used to compare between mean EGF and ulcer size in the four groups. **Tukey's** test for pair-wise comparisons was used to determine significant differences between groups when ANOVA test is significant.

Kruskal-Wallis test was used to compare between pain scale scores in the four groups. This test is the non-parametric alternative to one-way ANOVA test. Mann-Whitney U test was used in the procedure of pair-wise comparisons when Kruskal-Wallis test was significant.

3. Results:

1. EGF level

At day zero, there was no statistically significant difference between the four groups ($P = 0.06$). At day 2 and at day 5, there was no statistically significant difference between (A & L) and (L) groups; both showed the highest mean EGF values, where the mean EGF level at day 2 was 66.8 ± 5.1pg/ml in group (A& L) and 60.2 ± 4.8 pg/ml in the (L) group, and at day 5 the mean EGF value was 98.7 ± 13.9pg/ml for the (A& L) group and 85.1 ± 9.9 pg/ml in the (L) group. This was followed by Group (A) with a mean value of 42.5 ± 5.3pg/ml and 49.1 ± 4.9 pg/ml at day 2 and day 5 respectively. The Control group showed the statistically significantly lowest mean EGF value, being 30.2 ± 5.0 pg/ml at day 2 and 33 ± 5.5pg/ml at day 5 (Figure 1).

As regards the % increase in EGF, there was no statistically significant difference between (A & L) and (L) groups; both showed the statistically significantly highest mean % increase in both days ($P<0.001$), where the mean % increase was 108.8 ± 35.7 pg/ml in group (A&L), and 90.5 ± 24 pg/ml in group (L) on day 2, and 221.9 ± 56.5pg/ml in group (A&L), and 178.3 ± 67.9 pg/ml in group (L) on day 5. This was followed by Group (A) with a mean increase if 22.8 ± 8.3pg/ml and 42.4 ± 13.1pg/ml on days 2 and 5 respectively. The control group showed the

statistically significantly lowest mean % increase on both days being 20.3 ± 6.8pg/ml on day 2 and 31.5 ± 9.5pg/ml on day 5(Figure 2).

2. Pain score

At day zero, there was no statistically significant difference between the four groups ($P= 0.174$).

At day 2and at day5, there was no statistically significant difference between Group (A) and control groups; both showed the statistically significantly highest mean pain scores (4.8 ± 0.6 , $P= 0.007$ on day 2 and 4.7 ± 0.5, $P = 0.001$ on day 5).This was followed by group (L) with a mean pain score of 3.5 ± 0.6 on day 2 and 3.1 ± 1.6 on day 5. Group (A & L) showed the statistically significantly lowest mean pain score on both days ($P < 0.001$), where their mean score read 2 ± 0.6 on day 2 and 1.1 ± 1.7 on day 5(Figure 3).

As regards the % decrease in pain score, Group (A & L) showed the statistically significantly highest mean % decrease in pain score on both days being 60 ± 24.6 on day 2 and 77.1 ± 33.5 on day 5. This was followed by group (L) with a mean score of 14.6 ± 10.2 and 22.9 ± 40.3 on days 2 and 5 respectively. The mean % pain reduction values on day 2were 2 ± 1.5 and 4 ± 0.7 for group (A) and the control group respectively, while on day 5 they showed a mean % of reduction of 2.1 ± 5.2 for group (A) and 6 ± 1.2 for the control group. Statistical comparison between both groups yielded the significantly lowest mean % decrease in pain score on both days ($P< 0.001$).(Figure 4).

3. Ulcer size:

At day zero, there was no statistically significant difference between the four groups. ($P= 0.574$). At day 2 and at day 5, there was no statistically significant difference between Group (A) and control groups; both showed the statistically significantly highest mean ulcer size ($P = 0.023$ on day 2 and $P < 0.001$on day 5), where the mean ulcer size at day 2 was 5.7 ± 1.2 mm for group (A), and 6.5 ± 1mm for the control group, and 5 ± 0.8 mm for group (A) and 6.3 ± 1.1 for the control group on day 5. Similarly no significant difference was found between the mean values of (A & L) and (L) groups on day2 ($P = 0.023$), and day 5 ($P <0.001$), both showed the statistically significantly lowest mean size, where the mean ulcer size of group (A &L) was 3.9 ± 1.2 mm, and 1.1 ± 0.5mm and that of group (L) was 4.3 ± 1.4 mm and 2.6 ± 1.4mm on day 2 and 5 respectively (Figure 5).

As regards the % decrease in size at day 2, there was no statistically significant difference between (A & L) and (L) groups; both showed the statistically significantly highest mean % decrease (53 ± 10.1, 43.4 ± 9.4 respectively. This was followed by Group (A) with a mean % reduction of 29.4 ± 9.5.

Control group showed the statistically significantly lowest mean % decrease (7.1 ± 5.3),(P = 0.001).

As regards the % decrease in size at day 5, (A & L) group showed the statistically significantly highest mean % decrease (87.4 ± 15.9). This was followed by group (L) with a % decrease of 43.4 ± 9.4, then group (A) with a mean % decrease of 38.1 ± 5. The control group showed the statistically significantly lowest mean % decrease (10 ± 7.3) (Figure 6).

Table 1. Comparison between different parameters in the four groups

Group / Variable		A	A & L	L	Control	*P-value*
EGF level (pg/ml)	Day 0	34.6 ± 6.2	32 ± 4.8	31.6 ± 5.5	25.1 ± 4.3	**0.060**
	Day 2	42.5 ± 5.3 [b]	66.8 ± 5.1 [a]	60.2 ± 4.8 [a]	30.2 ± 5 [c]	**<0.001***
	Day 5	49.1 ± 4.9 [b]	98.7 ± 13.9 [a]	85.1 ± 9.9 [a]	33 ± 5.5 [c]	**<0.001***
	% increase Day 2	22.8 ± 8.3 [b]	108.8 ± 35.7 [a]	90.5 ± 24 [a]	20.3 ± 6.8 [c]	**<0.001***
	% increase Day 5	42.4 ± 13.1 [b]	221.9 ± 56.5 [a]	178.3 ± 67.9 [a]	31.5 ± 9.5 [c]	**<0.001***
Pain Score	Day 0	4.9 ± 0.4	5 ± 0	4.1 ± 0.9	5 ± 0	**0.174**
	Day 2	4.8 ± 0.6 [a]	2 ± 0.6 [c]	3.5 ± 0.6 [b]	4.8 ± 0.6 [a]	**0.007***
	Day 5	4.7 ± 0.5 [a]	1.1 ± 1.7 [c]	3.1 ± 1.6 [b]	4.7 ± 0.5 [a]	**0.001***
	% reduction Day 2	2 ± 1.5 [c]	60 ± 24.6 [a]	14.6 ± 10.2 [b]	4 ± 0.7 [c]	**<0.001***
	% reduction Day 5	2.1 ± 5.2 [c]	77.1 ± 33.5 [a]	22.9 ± 40.3 [b]	6 ± 1.2 [c]	**<0.001***
Ulcer Size (mm)	Day 0	8.1 ± 1.6	8.1 ± 1.3	7.4 ± 1.9	7 ± 1.3	**0.574**
	Day 2	5.7 ± 1.2 [a]	3.9 ± 1.2 [b]	4.3 ± 1.4 [b]	6.5 ± 1 [a]	**0.023***
	Day 5	5 ± 0.8 [a]	1.1 ± 0.5 [b]	2.6 ± 1.4 [b]	6.3 ± 1.1 [a]	**<0.001***
	% reduction Day 2	29.4 ± 9.5 [b]	53 ± 10.1 [a]	43.4 ± 9.4 [a]	7.1 ± 5.3 [c]	**0.001***
	% reduction Day 5	38.1 ± 5 [c]	87.4 ± 15.9 [a]	67.5 ± 15.1 [b]	10 ± 7.3 [d]	**<0.001***

Values are mean ± SD, *: Significant at $P \leq 0.05$ Values, Different letters in the same row are statistically significantly different
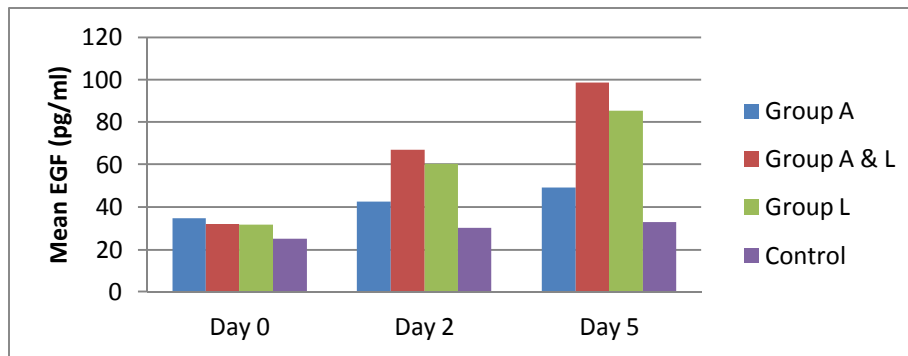
Figure 1. Bar chart representing the mean EGF level before and after treatment in the four groups
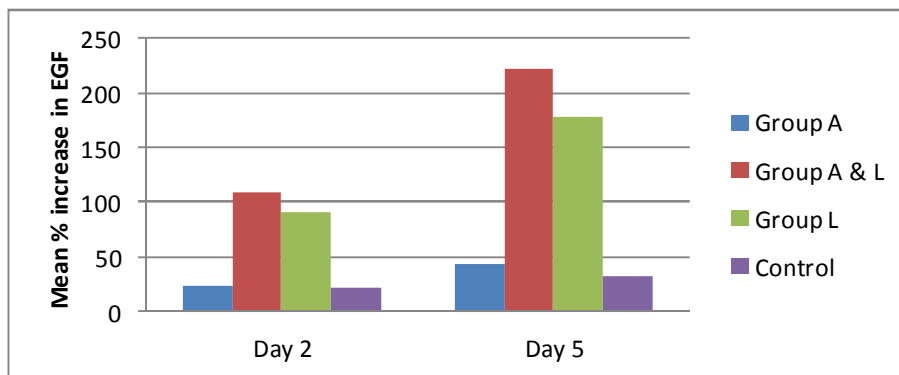
Figure 2.Bar chart representing mean % increase in EGF after treatment in the four groups
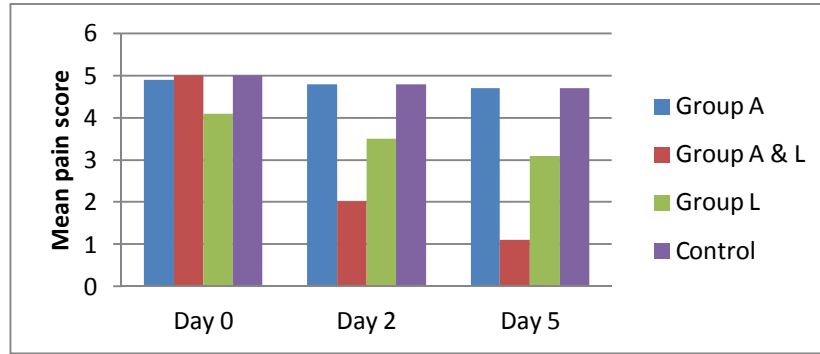
Figure 3.Bar chart representing mean pain score before and after treatment in the four groups
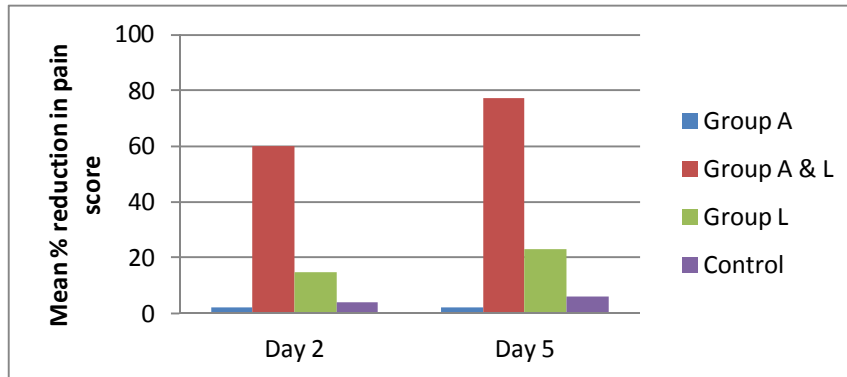
Figure 4. Bar chart representing mean % reduction in pain score after treatment in the four groups
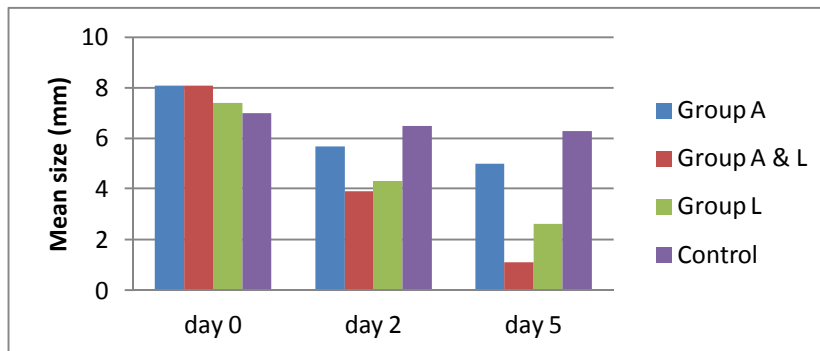

Figure 5.Bar chart representing mean ulcer size before and after treatment in the four groups
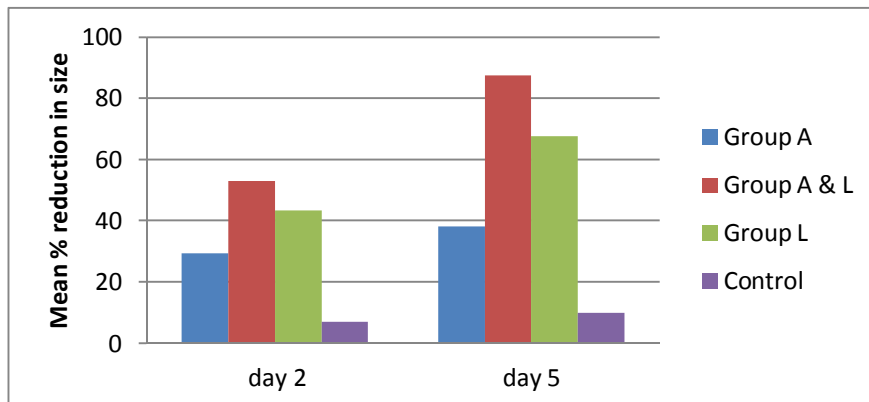

Figure 6.Bar chart representing mean % decrease in ulcer size after treatment in the four groups

4. Discussion

Recurrent aphthous stomatitis is the most common oral ulcerative condition affecting the general population, yet it is an important condition since it can be distressing and cause suffering and pain. In addition, it interferes with normal life activities by affecting eating and swallowing of the patients (1).

The worldwide use of natural products including medicinal plants has become more and more important in primary health care especially in developing countries. Many pharmacognostical and pharmacological investigations are carried out, to identify new drugs or to find new lead structures for the development of novel therapeutic agents for the treatment of human diseases (32). The present investigation has been attempted as a step toward this goal.

Growth factors are mediators with essential importance in the normal repair process after wounding. It has been suggested that oral or juxtaoral injury stimulates increased synthesis and secretion of growth factors in the saliva (33). EGF in saliva is cytoprotective against injuries and contributes to the maintenance of the integrity of gastrointestinal mucosa(8). Low salivary EGF levels have been observed in patients with various forms of oral mucosal disease (9).

The purpose of this study was to compare the efficacy of three herbal mucoadhesive pastes comprising either *Acacia nilotica* (A.nilotica) pod extract or *Glycyrrhiza glabra* (Licorice) root extract or a mixture of both, as active herbal components in the management of RAU and to correlate this effect with salivary epidermal growth factors level through the same observation periods.

The main problems related to the use of herbal medicines in treatment of RAU are the low documentation of the use of these medicines, lack of standardized preparation, low acceptance by the medical communities and low patient's compliance. In the present study a complete literature search was carried out and medicinal plants were selected according to their existing scientific data.

Our plan of work was based on the preparation of therapeutic agents derived from economic medicinal plants cultivated in Egypt and the performance of the suitable pharmaceutical preparations producing low cost effective products useful in management of some oral diseases. Achievement of these goals was gained through collection and taxonomical identification of plants under investigation, preparation and phytochemical investigation of successive extracts using different chemical and chromatographic techniques, studying the biological activity of the different successive extracts and preparing the biologically active ingredients in the suitable pharmaceutical dosage form after being tested for toxicity.

Semisolid preparations including pastes are advantageous over liquid preparations regarding oral lesions because of longer retention time on the oral mucosa, thus allowing extended contact between the diseased area and the active ingredients of the preparations (34). Owing to this fact, the herbal extracts in the current study were formulated as adhesive pastes allowing lower frequency of application, more patient's compliance and relief, in addition to a sustained therapeutic effect.

Patients were instructed to use the drug locally four times daily and to retain the formulation on the lesion for 30 min. This duration is considered sufficient for the tested agents to exert their pharmacological action on the ulcerated tissue and the results of the study were in support of the applied localized manner. Assessment of the therapeutic effect was done at days 0,2 and 5 representing the different clinical stages of RAU (pre ulcerative, ulcerative and healing stages (35).

To our knowledge, no studies have been carried out on the efficacy of *A. nilotica* and Licorice mixture extract on the management of aphthous ulcers except what reported on the efficacy of Licorice extract or antibacterial effect of *A. nilotica* individually. Hence the discussion is originally focused on the results of this study.

Findings of this study revealed that at day zero, there was no statistically significant difference between the four groups as regards pain score, ulcer size and salivary EGF level. Regarding the results of pain and ulcer size, the study demonstrated that at days 2 and 5, there was no statistically significant difference between group (A) and control group; both showed the statistically highest mean pain scores and ulcer size. At the same observational periods, (L) group showed lower pain scores than (A) and control groups. The (A&L) group showed the statistically significantly lowest mean pain score. However the results of ulcer size at day 2 and 5, showed no significant difference between (A & L) and (L) groups; both showed the lowest mean size.

Investigating the individual effects, it was observed that Licorice extract showed better healing and pain reduction results when compared to the *A. nilotica* results. However, administrating a combination of both resulted in a superior and more significant healing and pain reduction effect when compared to each individually with a remarkable effect of licorice on pain reduction even when applied individually This could be explained by the fact that local anti-inflammatory agents create a helpful environment to speed up healing and relief symptoms in the management of RAU (36,37). The abundant

anti-inflammatory property of licorice in the present study created an aiding role in the healing process and pain relief when compared to other groups of the study(21). Moreover, de-glycyrrhizinated licorice formulations that were used in the treatment of gastric ulcers, promoted healing by increasing mucous production and blood supply to the damaged stomach mucosa, thereby enhancing mucosal healing (38). Accordingly, similar mechanism of action could be assumed in the healing of oral ulcers. On the other hand, Moghadamnia *et al.* reported a significant reduction in the severity of RAU following the application of bio-adhesive patches containing Licorice extract (39).The mechanical protection of bio-patches however is a very considerable factor for reducing symptoms of RAU and could exert an overlapping action on the effect of licorice in this investigation.

In agreement with the results of the present study, a previous study used a mouth wash form of de glycerinized licorice and showed a significant anti-aphthous effect (26). Nevertheless, the noticeable effect of *A. nilotica* in the current study could not be obscured. This effect may be either attributed to the antimicrobial effect reported for *A. nilotica* or alteration of the microbial flora of the mouth, which resulted in less immunologic damage as reported for the effect of some antibacterial mouth rinses against RAU (3,39). Combination of both plant extracts may present a probable synergism reported for some other combinations (40), allowing a measurable benefit from the use of both, the antibacterial effect of *A. nilotica* and the anti-inflammatory effect of Licorice. This combination enhanced the healing process with an additional improvement effect on aphthous ulcers in comparison with the other groups of the study resulting in better healing and favorable pain reduction.

As an evidence for the effect of the formulations on healing acceleration, the present investigation has also attempted to correlate between reduction of ulcer size and pain and salivary EGF level during different stages of RAU. Different studies clarified that salivary EGF levels diminished in the ulcerative stage than in healing or pre ulcerative stage (31,35). Our results were in accordance with those studies. At days 2 and 5, both of (A & L) and (L) groups showed the statistically significantly highest mean EGF values. This was followed by Group (A). Control group showed the statistically significantly lowest mean EGF value. Salivary EGF level was reduced during the active stage of RAU, that was associated with the development of the stomatitis. As the oral mucosa is constantly bathed in saliva, a diminished salivary secretion of EGF in sufferers from aphthae may weaken the cytoprotective functions of

saliva on the oral epithelium (31). We also observed a differential, stage-dependent alteration of EGF levels in saliva in patients with RAU during the course of this disorder; the precise mechanism for these differential alterations is not clear. It is suggested that the synthetic mechanism for EGF in the salivary glands was impaired temporarily during the onset of aphthous ulceration and the onset might activate a self-defense mechanism by which the EGF synthesis recovered after remission (10, 31). It is reasonable to assume that the higher EGF mean values in group (A&L) than group (A) and control group, might be related to the combined anti-bacterial and anti-inflammatory effect of both Acacia and licorice respectively used by group (A&L). This combination created a field with diminished microbial and inflammatory challenge allowing enhanced activity of recovered EGF leading to accelerated healing of oral aphthous ulcers. On the other hand, the anti-inflammatory effect of Licorice either individually or mixed had a greater impact than the antimicrobial effect of *Acacia nilotica* on both the healing process and pain relief.

In conclusion, treatment of minor RAU using a mixture of Licorice and *Acacia nilotica* extracts revealed improved pain reduction and healing potential than each substance alone. These results correlated positively with salivary EGF levels measured during the same observational periods suggesting its potency as an effective product for treatment of minor aphthae.

Recommendation

Further studies are required to elucidate the probable mode of action of these plants with different concentrations and standardization of the products in comparison to other herbal pharmaceutical formulations. If similar results are confirmed in clinical trials, these plant extracts constitute a natural alternative to the conventional synthetic formulas utilized in current medications.

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Percutaneous Polymethylmethacrylate Vertebroplasty for the Treatment of Adjacent Vertebral Body Fracture after Long Spinal Instrumentation

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Abstract: Objectives: This study aims to assess clinical performance regarding pain relief and spinal stabilization with or without using PMMA (polymethylmethacrylate) for the treatment of adjacent vertebral body fracture after long spinal instrumentation. **Methods:** Twenty-four patients that underwent spinal instrumentation of at least 4 segments due to osteoprotic compression fracture (11 patients) or degenerative scoliosis (13 patients) developed adjacent vertebral fractures. They were 22 female and 2 male patients with an average age of 69 years old (range: 54-77 years). The mean follow-up was 25 months. Percutaneous vetebroplasty was performed in 11 patients, and another 13 received conservative treatment. **Results:** The results were assessed clinically and radiographically. Clinical follow-up involved an evaluation using the Huskisson's visual analog scale (VAS: 0 mm means no pain and 100 mm means the most pain possible) and mobility (walking ability, 4 grades). Preoperative and postoperative radiographs were compared to evaluate the maintenance of vertebral body height and sagittal alignment. There were no major complications in the vertebroplasty group. Immediate pain relief (vertebroplasty group: 73 to 29, control: 72 to 68), reduction in pain after the final follow-up (vetebroplasty group: 32, control: 65), and improvement in walking ability (vertebroplasty group: 2.3 to 0.5, control group: 2.4 to 1.5) were significantly satisfactory in the vertebroplasty group (p<0.05). The maintenance of sagittal alignment [vertebroplasty group: 8° (range, -15° to 25°) to 2° (range, -20° to 22°), control: 9° (range, -5° to 25°) to 19° (range, 3° to 45°)] and vertebral body height [vertebroplasty group: 0.63 (range, 0.40 to 0.88) to 0.7 (range, 0.41 to 0.92), control: 0.68 (range, 0.51 to 0.87) to 0.56 (range, 0.30 to 0.75)] was also significantly satisfactory in the vetebroplasty group (p<0.05). **Conclusions:** Percutaneous vertebroplasty provides significant pain relief and maintenance of sagittal alignment in the adjacent vertebral bony fracture after long spinal instrumentation. It is a useful and safe procedure for painful adjacent vertebral body fracture after long spinal instrumentation.
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Key words: Adjacent vertebral fracture, vertebroplasty, long spinal instrumentation

1. Introduction

In biomechanical studies, spinal instrumentation has strong rigidity at the fused level, and might cause extra stress on the adjacent vertebral segments.[1-3] The number of segments fused can also promote adjacent segmental disease, for the longer lever arm produced with polysegmental fusions causes more stress at the remaining free segments.[4] The extra stress may superimpose the adjacent vertebral pathology and even cause vertebral fractures.[5] Percutaneous vertebroplasty (PV) with polymethylmethacrylate (PMMA) is a radiologically-guided therapeutic procedure that has been used successfully to treat aggressive vertebral angiomas and painful osteolytic vertebral tumors.[6,7] The procedure has subsequently been extended to patients with osteoporotic compression fractures. It results in good pain relief and has a low complication rate.[8-11] There are very few reports on the use of vetebroplasty in the management of adjacent vertebral body fracture after long spinal instrumentation. The purpose of this study was to assess clinical performance regarding pain relief and spinal stabilization with or without the use of PMMA for the treatment of adjacent vertebral body fracture after long spinal instrumentation.

2. Materials and Methods

Twenty-four patients that underwent spinal instrumentation of at least 4 segments due to osteoprotic compression fracture (11 patients) or degenerative scoliosis (13 patients) developed adjacent vertebral fractures. They were 22 female and 2 male patients with an average age of 69 years old (range: 54-77 years). The mean follow-up was 25 months. The conditions of treatment were discussed with the patients and the benefit/risk ratio was carefully explained. Eleven patients (vertebroplasty group) underwent PV treatment and another 13 (control group) received conservative treatment, including bed rest, analgesics, and bracing. The fracture locations were from the T4 to the L4 level (Table 1).

The vertebroplasty procedures were performed after neuroleptanalgesia and under local anesthesia with the patients in the prone position. In all cases, vertebroplasty was done under fluoroscopic guidance with a guide pin through the pedicle into the fractured vertebra. Then, a cannulated obturator was placed over the guide pin to create a larger working channel advancing into the anterior of the vertebrae body. After correctly positioning the needle, the inner stylet was removed. Contrast material was then injected to assure that the needle was not positioned in the venous flow path. If this occurred, repositioning of the needle was required. The PMMA powder was mixed with liquid and contrast medium to increase its radio-opacity until a homogenous liquid form was achieved. The flow of the cement was followed on the image intensifer. The needle was repositioned if the cement preferentially flowed to the endplate fractures or into the adjacent venous flow pathway. The distribution of the cement was usually homogenous after injection (Figure 1A, B). A follow-up CT (Figure 1C) was done routinely within a few hours after the procedure to evaluate the extent of filling, the distribution of cement in the vertebral body, and the avoidance of cement flowing into the spinal canal, the neural foramina, the adjacent intervertebral dicks, paravertebral tissues, or paraspinal veins. Adverse effects, pain, and radiographs were evaluated before and after treatment, and at follow-up. The patients were asked to quantify their degree of pain using a Huskisson's visual analog scale[12] (VAS: 0 mm means no pain and 100 mm means the most pain possible). Mobility was assessed using the following semiquantitative scale: 0, walking without assistance; 1, walking with assistance; 2, wheelchair-bound; 3, activity restricted to sitting in bed; 4, bedridden.[13] The vertical height of all pretreatment, post-treatment, and follow-up fractured vertebrae were measured in series. The vertebral height was defined as the distance (endplate to endplate) at the center (A) of the vertebral body on a lateral spinal radiograph. The vertical height (B) of the vertebra above the fractured vertebra was also measured to give an estimate of the pre-fracture height.[14] The ratio of vertebral height (A/B) was calculated to evaluate the maintenance of the vertebral body height in series. Sagittal alignment was measured as the angle between the lower endplate of the intact vertebrae above the lesioned vertebra and the lower end plate of the lesioned vertebra. Data for preoperative and postoperative radiographic analysis were compared using a Student's t test. Fish's exact test was used to analyze the outcome data for each group. A p value of <0.05 was considered significant.

3. Results

The vertebroplasty group tolerated the percutaneous PMMA vertebroplasty procedure well, and the VAS scores decreased significantly between baseline and after injection, and between baseline and the final follow-up (Table 2). The scoring did not significantly change in the control group. Immediate pain relief (vertebral group: 73 to 29, control: 72 to 68) and the reduction in pain after the final follow-up (vertebral group: 32, control: 65) were significantly satisfactory in the vertebroplasty group (p<0.05). In the vertebroplasty group (Table 3), the middle/posterior body height ratio was 0.63 before treatment, 0.73 after treatment, and 0.70 at the final follow-up. In the control group, the middle/posterior body height ratio was 0.68 at baseline, and showed a progressive loss to 0.56 at the final follow-up. The sagittal alignment varied from a maximum kyphotic angle of 25 degrees to a minimum lordotic angle of 15 degrees, with an final average improvement of 6 degrees (Table 4) in the vertebroplasty group. In the control group, kyphosis varied from a maximum kyphotic angle of 25 degrees to a minimum lordotic angle of 5 degrees, with an average worsening of 10 degrees in the final follow-up. The maintenance of sagittal alignment and vertebral body height was significantly satisfactory, as well, in the vertebroplasty group (Figs 1, 2). There was no major systemic complication in the vertebroplasty group. The mean bone mineral density was available in 18 of 24 cases, with a T scare < -2.5 for the femoral neck.

4. Discussion

Many reports have suggested that spinal fusion creates a significant compensatory increased motion in the adjacent mobile segments through the increased stiffness of the fused segments.[1-3] These levels were thought to be subjected to higher loads during normal activities. There is also a common belief that the fusion of parts of the spine creates extra stress in the neighboring unfused segments, and that the longer and stiffer the fusion mass, the greater this stress.[3-5] The extra stress may be superimposed on the adjacent vertebral deformity and exaggerate the clinical symptoms. The minimal approach[15,16] of vertebroplasty can avoid that surgical intervention in this complex problem is fraught with complications and poor results, especially in patients with advanced osteoporosis.[17] To prevent the disastrous situation of an adjacent pathology, attention must be paid to the treatment of this complex problem, although no beneficial effect of vertebroplasty as compared with a sham procedure in patients with painful osteoporotic vertebral fracture has been reported.[18,19] Radiographically-evident vertebral deformities are recognized as discrete clinical events characterized by persistent pain which typically is less when the patient is at rest and worse when the patient is active.[20,21] This

is consistent with our findings in the control group, in which there was persistent pain and no significant improvement in walking ability. The PV procedure was introduced for the treatment of osteoporosis in patients who have prolonged pain and disability following vertebral fractures.[22] Studies have shown that this procedure is associated with good pain relief.[20,22,23] As the menopausal symptome, high prevalence of menopausal symptoms that adversely affected their quality of life, the chronic pain is associated with the poor quality of life.[24,25] Walking ability improved an average of 1.8 grades in our vertebroplasty group compared with 1.9 grades in Tohmeh's study.[26] Our results are promising and match previous reports.

Complications after PV occur with extremely low frequency. The complication rate in osteoporotic fractures is 1%-3%, and as high as 10% in the treatment of metastatic lesions.[6,7,23] The risks and complications of vertebroplasty, including bleeding, infection, pain, cement leakage, nerve root compression, paralysis and pulmonary embolization have been reported.[27-32] Most of the complications resulted from the injection of cement. The best way to inject cement safely without unexpected or undesired migration has been discussed widely. First, we believe that careful patient selection is essential to the success of PV. Second, safe needle placement under fluoroscopy must avoid not only the spinal canal and existing nerve roots, but also the center of the posterior portion of the vertebral body, where there may be a higher likelihood of entering a large channel of the basivertebral plexus. Good visualization of the clear anatomy and cement deposition are very important, especially in patients with severe scoliosis. Imaging of the thoracic and lumbar vertebra would be hampered by air in the lung and bowel gas, respectively. We stress the benefit of biplane fluoroscopic guidance, which is better than portable fluoroscopy and stationary C-arm equipment, to produces live images. The imaging quality of biplane fluoroscopy is superior to the others and it makes real time cement monitoring possible. Third, no obvious neurologic side effect has occurred during follow-up till now. We believe that early postoperative detection of undesired cement migration is as important as safe cement injection, especially with regard to most neurologic complications, and allows the operator to take action before the situation deteriorates and becomes irreversible. With proper patient selection and good technique, complications after vertebroplasty have been infrequent, and most were minor.[9,19,33,34] There were no major systemic complications in this series.

However, there were some limitations to this study. One is that this was not a prospective randomized clinical trial, although most variables were collected. The other is that the number of patients available was small. The research team is currently considering increasing the patient sample size and arranging a prospective randomized clinical trial. In conclusion, PV provided significant pain relief and satisfactory maintenance of sagittal alignment in the painful adjacent vertebral body fracture after long spinal instrumentation. It is a safe and useful procedure for painful adjacent vertebral body fractures after long spinal instrumentation.

Table 1. Fracture level

	Vetebroplasty Group	Control
T4		1
T6		1
T8	1	1
T10	2	
T11		1
T12	2	1
L1	4	5
L3	1	2
L4	1	1

The locations of fracture were from the T4 to L4 levels. In the vertebroplasty group, 3 patients had a fracture in the thoracic region (T8-T10), 6 in the thoracolumbar region (T11-L2), and 2 in the low lumbar region (L2-L4). In the control group, 3 patients had a fracture in the thoracic region (T4-T8), 7 in the thoracolumbar region (T11-L2) and 3 in the low lumbar region (L2-L4).

Table 2. Changes over time in the verbal scale

Initial	Follow-up	Final
Vertebroplasty Group		
73±21	29±20*	32±19*
Control		
72±23	68±22	65±18**

The VAS scores decreased significantly between baseline and after injection, and between baseline and the final follow-up. The scoring did not significantly change in the control group.
* p<0.05 (pair-wise comparisons from base line)
** p<0.05 (pair-wise comparisons between the vertebroplasty and control groups)

Table 3

	Initial	Follow-up	Final
Vertebroplasty	0.63	0.73	0.7
Group	(Range: 0.40↔0.88)	(Range: 0.45↔0.96)	(Range: 0.41↔0.92)
Control	0.68	0.62	0.56*
	(Range: 0.51↔0.87)	(Range: 0.42↔0.80)	(Range: 0.30↔0.75)

The average restoration of the fractured vertebral body height was significantly satisfactory in the vertebroplasty group.
* $p < 0.05$ (pair-wise comparisons between the vertebroplasty and control groups)

Table 4. Segmental Kyphosis

	Initial	Follow-up	Final
Vertebroplasty	8°	1°	2°
Group	(Range: -15°↔25°)	(Range: -22°↔20°)	(Range: -20°↔22°)
Control	9°	15°	19°*
	(Range: -5°↔25°)	(Range: 0°↔40°)	(Range: 3°↔45°)

The maintenance of sagittal alignment was significantly satisfactory in the vertebroplasty group.
* $p < 0.05$ (pair-wise comparisons between the vertebroplasty and control groups)
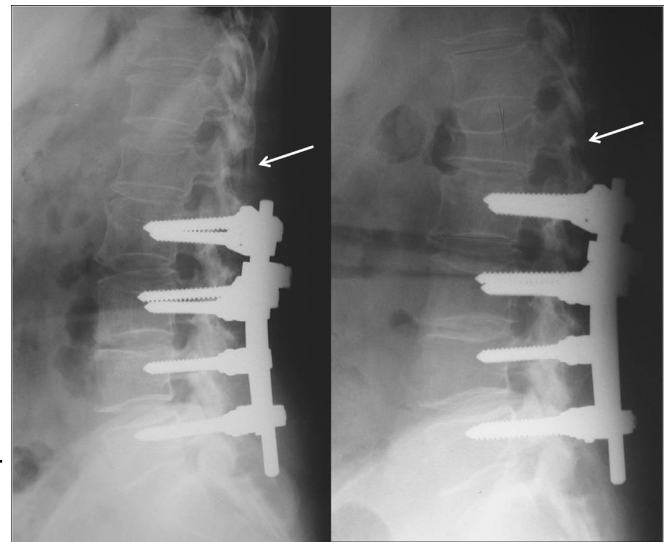
Fig. 1A. A 65-year-old female who had received spinal operation one year before suffered from intractable back pain with buttock radiation after falling. The radiography showed a L1 osteoporotic vertebral compression fracture.
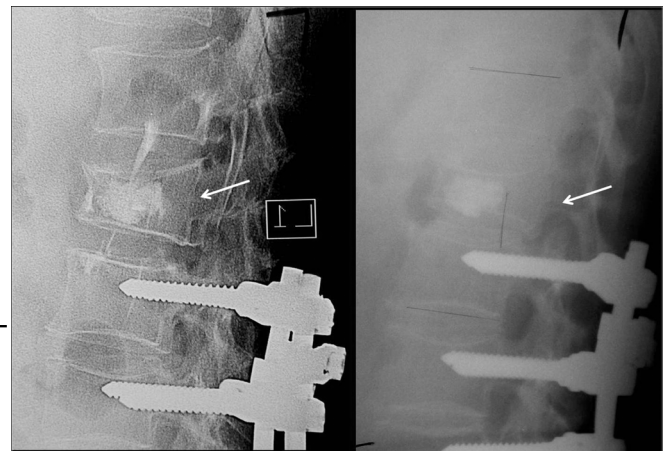
Fig. 1B. The postoperative radiography revealed good augmentation of the fractured vertebral body after cement pouring, and the maintenance of sagittal alignment and vertebral body height were good in the final follow-up.

Fig. 1C. Postvertebroplasty CT showed cement was in the vertebral body without leakage and the previous inserted needle hole (arrow) was noted.
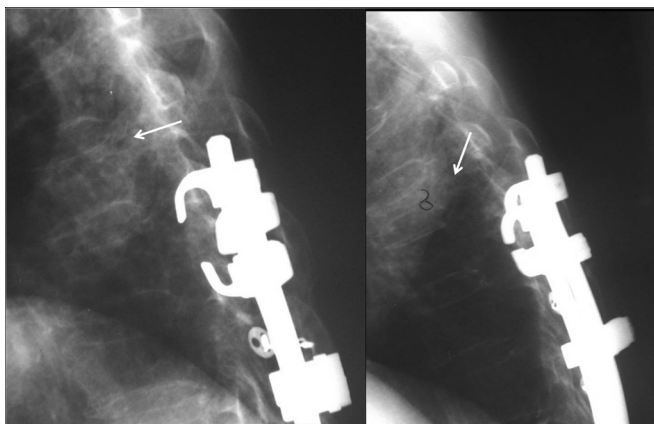
Fig. 2A. A 68-year-old female who had received spinal operation 15 months before suffered from intractable back pain after falling. The radiography showed a T6 osteoporotic vertebral compression fracture.
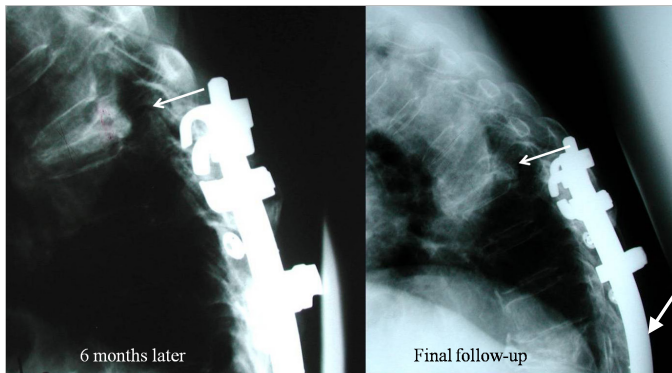
Fig. 2B. Radiographic evaluation of the vertebral compression fracture demonstrated loss of vertebral body height and significantly increased segmental kyphosis at the final follow-up.

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Treatment of Osteoporosis with TheraCyte-Encapsulated Parathyroid Cells: A Study in a Rabbit Model

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Abstract: Background/Purpose: PTH has been used in the treatment of osteoporosis. Implantation of TheraCyte-encapsulated parathyroid cells increasing the BMD of the spine and femur in a rat model was reported in our previous study. The aim of this study was to compare the effect of TheraCyte encapsulating $4x10^7$ or $4x10^6$ live human parathyroid cell on bone mineral density of ovariectomized rabbits. **Methods:** Twenty-seven New Zealand rabbits divided randomly into three groups: (1) TheraCyte encapsulating $4x10^7$ live parathyroid cells as the group A; (2) TheraCyte encapsulating $4x10^6$ live parathyroid cells as the group B; (3) a sham operation as the control group. Rabbits were ovariectomized 1 month prior to the implantation of the TheraCyte. Blood was drawn from the rabbit at the time of implantation and monthly for four months. The BMD of the lumbar spine (L1-L5) and the left femoral bone were measured with dual-energy Xray absorptiometry (DEXA) 1 month after ovariectomy and 3 months after implantation. **Results:** In the control group, both the BMD of the lumbar spine (L1-L5) and the BMD of the femoral bone had decreased significantly 3 months after implantation. In the group A, the BMD of both the lumbar spine and left femoral bone had increased significantly. In the group B, the BMD of both the lumbar spine and the left femoral bone had also increased significantly. Serum iPTH levels were higher in the group A than in the control group. **Conclusion:** Implantation of TheraCyte A-encapsulated $4x10^7$ live parathyroid cells and TheraCyte B-encapsulated $4x10^6$ cells can increase the BMD of ovariectomyized rabbits after 3 months of implantation. Higher serum iPTH were noted in the group A. Implantation of TheraCyte-B encapsulated $4x10^6$ live parathyroid cells could increase the BMD of ovariectomized rabbits and was safe for rabbits weighing 3.0kg in this study.
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1. Introduction

The anabolic effects of PTH (1-34) on the skeleton via the PTH-1 receptor on osteoblasts and bone marrow stromal cells have been well documented in the literature.[1,2,3] PTH has been used in the treatment of postmenopausal osteoporosis, senile osteoporosis in men, and glucourticoid-induced osteoporosis.[1,2,3,4] Although it is effective in the treatment of osteoporosis, daily injection of PTH for a period of 1-2 years is necessary.[5,6,7] An alternative to the daily injection is the transplantation of parathyroid tissues. There are currently several methods available, however, the main obstacle to human parathyroid transplantation is immunological rejection.[8,9] Implantation of TheraCyte-encapsulated live parathyroid cells increasing the BMD of the spine and femur in a rat model was reported in our previous study.[10] The aim of this study was to evaluate the parathyroid function monthly after implantation of TheraCyte-encapsulated parathyroid cells into ovariectomized rabbits and to determine the effect on BMD 4 months after ovariectomy (3 months after implantation).

2. Materials and Methods

Preparation of the Animals

Twenty-seven New Zealand rabbits, 3kg in weight and 3 months of age, were selected for the study. All rabbits were subjected to a bilateral ovariectomy. One month later, rabbits randomly assigned to three groups were subjected to surgical interventions: group 1 rabbits (No=9) underwent a sham operation on their backs as the control group; group 2 rabbits (TheraCyte A; N=9) received an implantation of the TheraCyte encapsulated $4x10^7$ live parathyroid cells into the subcutaneous layer of their backs; group 3 rabbits (TheraCyte B; N=9) underwent an implantation of the TheraCyte encapsulated $4x10^6$ live parathyroid cells. The body weight of each rabbit was measured at baseline and 4 months after the ovariectomy (3 months after implantation of the TheraCyte).

Preparation of PTH Cells

Parathyroid tissues were obtained from patients undergoing surgery for symptomatic secondary hyperparathyroidism. All specimens were cut into pieces less than 7 mm in size and collected in Roswell Park Memorial Institute (RPMI) solution (85%), dimethyl sulfoxide (DMSO) (10%) and fetal calf serum (5%). After step-freezing to -79°C, specimens were stored in liquid ritrogen (-197°C). The animal Use and Care Committee had approved the procedure and

written informed consent was obtained from all patients.

The parathyroid tissue was thawed in a 37°C water bath and minced into small fragments in a medium (DMEM-F-12) (Sigma Chemical Co., St., Louis, MO, USA) and digested for 2 hours at 37°C in media containing collagenase II (1.2mg/ml, Sigma Chemical Co., St. Louis, MO, USA). After centrifugation at 500g and mechanical dispersion, the pellet was resuspended in the complete growth medium (DMEM-F-12 supplemented with 5% calf serum, 1% Nutridoma-SP (Boehing Manheim, Germany), 100u penicillin/ml, 100ug of streptomycin/ml, 1mM Caclz and 0.5 mM Mgclz) and the suspension filtered through 60- and 150-mesh screens. The viability of the detached cells (trypsin/0.06% EDTA) was tested by the trypan blue method. A mixture of 1 ul of cells (density of $4x10^5$/ml) and 5µl trypan blue was prepared and the mixture then placed on a counting chamber to determine the viability ratio (live cells / live + dead cells). The TheraCyte implantable system (Irvine, Calif) was used, or cell encapsulation. Parathyroid cells were passed through a 150-mesh screen, collected and distributed, and then were suspended in RPMI solution at a density of $4x10^7$ live cells /ml in the TheraCyte A group, and at a density of $4x10^6$ live cells/ml in the TheraCyte B group. Using the centrifugation loading method, according to the users manual (TheraCyte), the TheraCyte encapsulating live parathyroid cells were implanted into the subcutaneous layer of the backs of ovariectomized rabbits. TheraCyte devices were comprised of an inner membrane of 30µm thickness of polytetrafluroethylene (PTFE) and with a 0.4µm pore size that prevented the entry of cells into the device and allowed the entry of antibiotics and compliment factors. A laminated outer membrane with a 5µm pore size and 15µm thickness of PTFE improved biocompatibility and induced vascularization. Finally, $4x10^7$ live parathyroid cells in a volume of 1ml were loaded into the 20-µl device (TheraCyte A) and $4x10^6$ cells in a volume of 1ml were loaded into the 20-µl device (TheraCytes B).

Serum calcium, phosphorus, and human intact parathyroid hormone (iPTH) levels

The body weight of each rabbit was measured at baseline and 4 months after the ovariectomy (3 months after implanttion of the Theracyte). At 0-month, 1-month, 2-months and 3-months after implantation, blood was drawn at 3pm from the rabbits' vein to check serum levels of calcium, phosphorus, and human iPTH levels. Thus, they were not fasting parameters. Three months after implantation, half of the rabbits were sacrificed for histological examination of the TheraCyte system and tissues around the TheraCyte, to find parathyroid cells in the TheraCyte, and reaction and fibrosis around the TheraCyte. Half of the rabbits

were kept alive until 7 months after ovariectomy to determine the possibility of bone tumor formation, using X-ray examination. Blood was collected in a tube with sodium heparin, and serum was isolated from the blood after centrifugation at 500 rpm for 10 min at 4°C. Serum calcium levels were established by colorimetric determination using the cresolphalein complex, serum phosphorus levels by UV methods, and iPTH levels by means of a radioimmunoassay method using a commercial kit (Nichols Institute Diagnostics, Capistrano, Calif.). Histological examination included hematoxylin and eosin stains and immunohistochemical statins with monoclonal rabbit antibody against human parathyroid hormone (clone 3B3, Dako Denmark; dilution 100). Immunohistochemical staining was performed, using the one-step horseradish-peroxidase technique (Polymer plus, Zymed, USA), after antigen retrieval by microwaving for 7 minutes x 2 times at 95°C to 99°C in citric buffer (1x concentration, PH 6.0; Euroclone, UK) with diaminobenzidine as chromogen on an automatic immunostainer (Opimax plus 2.0, BioGenex, USA).

Dual-Energy X-ray Absorptiometry (DEXA)

The lumbar spine (L1-L5) and left femoral bone were examined by DEXA. BMD (in grams per centimeter square) was determined using a modal Delphi A apparatus (Hologic, Bedford, Mass) at 1 month and 4 months after ovariectomy (3 months after implantation of the TheraCyte).

Statistical Evaluation

Data were expressed as mean ± standard deviation. Statistical analysis was performed using Wilcoxon signed ranks test for two related non-parametric data or paired t-test for two related parametric data, and repeated measures analysis of variance for iPTH, calcium, and phosphorus levels. To determine which group was different from the others, the simultaneous multiple comparison techniques of Bonferroni were used. SPSS (version 10.0, Chicago, IL) software was utilized. A p value less than 0.05 was considered significant.

3. Results

The viability ratio after thawing the cryopreserved parathyroid cells was 55-79%, while that of the fresh tissue was approximately 99-100%. The mean body weight of rabbits before ovariectomy was 3.03±0.22 kg in the control group, 2.82±0.55 kg in the TheraCyte A group and 2.87±0.56 kg in the TheraCyte B group. Four months later, the mean weight of the rabbits was 3.94 ± 0.41 kg in the control group, 4.01±0.25 kg in the TheraCyte A group, and 4.11±0.35 kg in the TheraCyte B group. The increase in body weight 4 months after the ovariectomy was significant

in each group (all $p<0.05$). However, there were no significant differences among groups with regard to body weight at the 4-month examination. The BMD of L1-L5 1 month after ovariectomy was 0.332 ± 0.016 g/cm^2 in the control group, 0.303 ± 0.057 g/cm^2 in the TheraCyte A group, and 0.286 ± 0.033 g/cm^2 in the TheraCyte B. Three months after implantation, the BMD of L1-L5 was 0.317 ± 0.020 g/cm^2 in the control group, 0.370 ± 0.028 g/cm^2 in the TheraCyte A group and 0.399 ± 0.054 g/cm^2 in the TheraCyte B group. These increases in BMD were significant in the TheraCyte A group ($p=0.011$) and TheraCyte B group ($p=0.008$), and the decrease in BMD was significant in the control group ($p=0.011$) (Fig. 1a). The BMD of the left femoral bone 1 month after ovariectomy was 0.562 ± 0.071 g/cm^2 in the control group, 0.415 ± 0.047 g/cm^2 in the TheraCyte A group and 0.445 ± 0.069 g/cm^2 in the TheraCyte B group. Three months after implantation, the BMD of the left femoral bone was 0.482 ± 0.055 g/cm^2 in the control group, 0.603 ± 0.048 g/cm^2 in the TheraCyte A group, and 0.587 ± 0.054 g/cm2 in the TheraCyte B group. These increases in the BMD of the left femoral bone were significant in the TheraCyte A Group ($p=0.008$) and the TheraCyte B group ($p=0.008$), and the decrease in BMD was significant in the control group ($p=0.017$) (Fig. 1b). Serum iPTH levels was significantly higher in the TheraCyte A group than in the control group ($p=0.021$). Serum iPTH levels were not significantly higher in the TheraCyte B group than in the control group ($p=0.094$) (Table 1).

Serum calcium levels at 1 month in the TheraCyte A group were significantly higher than those at ovariectomy in the same group ($p<0.05$) (Table 2), and also significantly higher in the TheraCyte A group than in the control group ($p=0.031$) (Table 2). Serum phosphorus levels were not significantly different among the three groups (Table 3). X-ray examination did not reveal the presence of bone tumors at 7 months after ovariectomy (6 months after implantation) in twelve rabbits (four in the control group, four in the TheraCyte A group and four in the TheraCyte B group). One month after implantation, the histological examination using hematoxylin and eosin (Fig. 2a) and the immunohistochemical stains (Fig. 2b) revealed the presence of parathyroid cells in the TheraCyte. Three months after implantation, parathyroid cells could be found both in the TheraCyte A group and the TheraCyte B group (Figs. 3a, 3b and 4a, 4b). Few fibroblast cells and no fibrosis were found around the TheraCyte (Figs. 2a, 3a, 4a).

4. **Discussion**

The PTH effect, improving bone mass and strength, has been noted in rats, monkeys, dogs, and rabbits.[11,12,13,14] The largest and most important clinical study to date is that of Neer and Colleagues.[5] At the end of their experimental study period, bone density values in the spine had increased by 9.7% in the 20-μg teriparatide (PTH 1-34) group and by 13% in the 40-μg dose group, compared with a 1% increase in the placebo group. The changes in hip femoral neck BMD were smaller, being 2.8% in the 20-μg group compared with a loss of 0.7% in those participants receiving a placebo. The proportion of women who experienced more than one vertebral fracture was reduced by 90% with the 20-μg daily dose, from 5% to 0.5%.[5] These results demonstrated that teriparatide is very effective in halting the progression of vertebral fractures in women known to have severe osteoporosis. The 40-μg dose was associated with more frequent side effects in the report. The 20-μg dose of triparatide, administered by daily subcutaneous injection, was approved for clinical use in November 2002. PTH (1-34) treatments in rats are associated with an increased incidence of bone tumor.[6] Also, daily injections of PTH (1-34) or PTH (1-84) are inconvenient and troublesome, which is why we initiated our studies. The results of our previous study showed that implantation of TheraCyte-encapsulated live parathyroid cells could increase the BMD of the spine and femur in a rat model.[10] Now, we extended the study to a rabbit model. In our rabbits, body weight at 4 months after ovariectomy was significantly higher than that at the baseline. However, the differences among the groups were not significant at 4 months after ovariectomy. The effect of body weight on BMD could therefore be ignored.[15,16,17] No bone tumors were found in either the control group or the experimental group during a 7-month period. We used parathyroid cells that had been cryopreserved for more than 3 years, yet the viability after thawing was quite good, at around 70%. An approximate 70-90% reduction in live cells has been observed following cryopreservation of bovine parathyroid glands, either as tissue fragments or as dispersed cells, regardless of the length of cryopreservation.[18] However, a higher percentage of viable cells – in excess of 88% -- has been reported in other studies[10,19,20,21] as well as this study. Using a microencapsulation of human parathyroid cells, various investigators have found a significant increase in PTH secretion in vitro and in animals without pharmacological immunosuppression.[22,23,24]

Following the implantation of the TheraCyte-encapsulated parathyroid cells in rabbits, we found that the parathyroid cells could survive and secrete iPTH (1-84) for up to 3 months without immunotherapy. No lymphocyte infiltration was found within the TheraCyte device. Some fibroblast

cells were found around the TheraCyte, but without foreign body response. Serum levels of iPTH (1-84) were higher in the TheraCyte A group, which caused a higher serum calcium level than in the control group due to the greater number of cells in the TheraCyte A group. Serum levels of phosphorus were not significantly different between the groups, because the normal kidney in the rabbit was able to keep the phosphorus levels at normal ranges. Three months after implantation, the BMD of L1-L5 in the TheraCyte A and TheraCyte B group increased significantly. Also, 3 months after implantation, the BMD of the left femoral bone in the TheraCyte A and TheraCyte B group, respectively, increased significantly. By comparison, in the control group, the BMD of L1-L5 and of the left femoral bone decreased significantly due to the ovariectomy effect. Although the results are encouraging, care must be taken when extrapolating these results to human. As with any animal study,[25,26,27,28] not all results seen in lower species are reproducible in higher species. Further sutides[29] are needed to determine the clinical significance. We concluded that implanted TheraCyte-encapsulated $4x10^6$ live parathyroid cells can function very well and increase BMD in both the lumbar spine and femoraup to 3 months or longer. In addition, the TheraCyte-encapsulated $4x10^6$ live parathyroid cells did not cause high levels of calcium or low levels of serum phosphorus. Implantation of TheraCyte-encapsulated $4x10^7$ live parathyroid cells can increase BMD in both the lumber spine and the femoral bone, but it may cause higher serum iPTH and calcium levels due to the greater number of cells in the TheraCyte. Implantation of TheraCyte-encapsulated $4x10^6$ live parathyroid cells increased the BMD of ovariectomized rabbits and was safe for rabbits weighting 3.0kg in this study.

Table 1. Serum levels of iPTH (pg/ml) at 0, 1, 2, and 3 months after TheraCyte implantation

	Ovariectomy	One month	Two months	Three months
Control (n=9)[ab]	10.248±0.88	10.604 ±0.62	9.913± 0.43	10.068 ±1.32
Theracyte A[ac] (n=9)	9.092±1.55	21.325 ± 12.12*	18.667 ±7.43*	17.34± 8.47*
TheraCyte B[bc] (n=9)	8.843±1.37	12.215 ±3.84	14.879 ±6.48	15.774 ±8.72

All data = means ± standard deviation.

* P <0.05 versus at ovariectomy (using paired t-test)
[abc] Values were obtained using repeated measures analysis of variance.
[a]p=0.021;   [b]p=0.094;   [c]p=0.462

TheraCyte A: implantation of $4x10^7$ parathyroid live cells
TheraCyte B: implantation of $4x10^6$ parathyroid live cells

Table 2. Serum levels of calcium (mg/dl) at 0, 1, 2, and 3 months after TheraCyte implantation

	Ovariectomy	One month	Two months	Three months
Control (n=9)[ab]	11.9±1.03	12.2± 2.09	12.3± 1.39	12.5± 1.47
Theracyte A[ac] (n=9)	12.3±0.94	13.7± 1.13*	14.6± 1.36*	13.7± 1.50*
TheraCyte B[bc] (n=9)	12.9±0.98	12.8± 1.17	13±1.69	12.7± 1.47

All data = means ± standard deviation.

* P <0.05 versus at ovariectomy (using paired t-test)
[abc] Values were obtained using repeated measures analysis of variance.
[a]p=0.031;   [b]p=0.066;   [c]p=0.711
TheraCyte A: implantation of $4x10^7$ parathyroid live cells
TheraCyte B: implantation of $4x10^6$ parathyroid live cells

Table 3 Serum levels of phosphorus (mg/dl) at 0, 1, 2, and 3 months after TheraCyte implantation

	Ovariectomy	One month	Two months	Three months
Control (n=9)[ab]	11.9±1.03	12.2± 2.09	12.3± 1.39	12.5± 1.47
Theracyte A[ac] (n=9)	12.3±0.94	13.7± 1.13*	14.6± 1.36*	13.7± 1.50*
TheraCyte B[bc] (n=9)	12.9±0.98	12.8± 1.17	13±1.69	12.7± 1.47

All data = means ± standard deviation.

* P =0.156 versus at ovariectomy (using paired t-test)
** P=0.440 versus at ovariectomy (using paired t-test)
[abc] Values were obtained using repeated measures analysis of variance.
[a]p=0.156;   [b]p=0.440;   [c]p=0.491
TheraCyte A: implantation of $4x10^7$ parathyroid live cells
TheraCyte B: implantation of $4x10^6$ parathyroid live cells
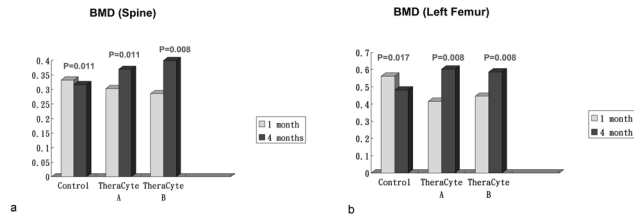
a   b

Fig.1 1a-bBone mineral density (BMD) after ovariectomy and 3 months after implantation (4 months after ovariectomy) in the control, and TheraCyte (a) $4x10^7$ live parathyroid cell and (b) $4x10^6$ live parathyroid cell groups. Wilcoxon Signed Ranks test was used.
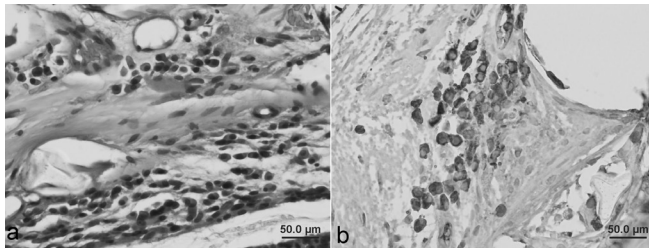

a   b

Fig. 2 (a) Hematoxylin and eosin staining reveals the presence of cells in the TheraCyte (x132) group 1 month after implantation of the TheraCyte-encapuslated $4x10^6$ live parathyroid cells. (b) Immunohistochemical staining reveals the presence of iPTH-positive cells in the TheraCyte (x132) group 1 month after implantation of the TheraCyte-encapsulated $4x10^6$ live parathyroid cells.

a   b
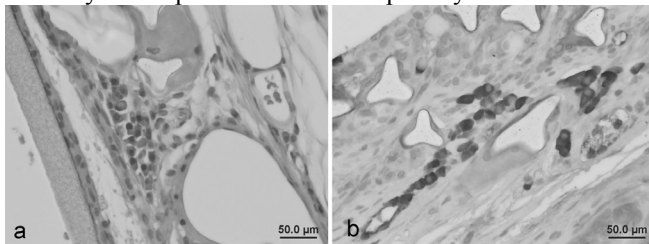
Fig. 3 (a) Hematoxylin and eosin stain reveals the presence of cells in the TheraCyte (x132) group 3 months after implantation of the TheraCyte-encapsulated $4x10^6$ live parathyroid cells. There is no fibrosis and few fibroblast cells around the TheraCyte. (b) Immunohistochemical staining reveals the presence of iPTH-positive cells in the TheraCyte (x330) group 3 months after implantation of the TheraCyte-encapsulated $4x10^6$ live parathyroid cells. There are fewer iPTH cells 3 months after implantation than at 1 month after implantation(Fig. 2b).

a   b
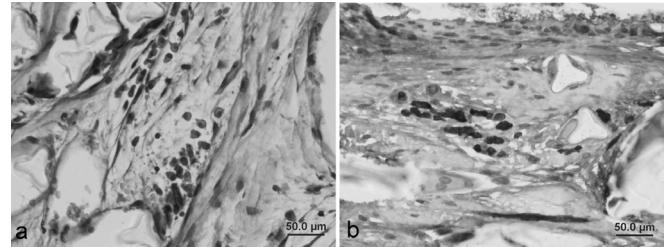
Fig. 4 (a) Hematoxylin and eosin staining reveals the presence of cells in the TheraCyte (x132) group 3 months after implantation of the TheraCyte-encapsulated $4x10^7$ live parathyroid cells. There is no fibrosis and few fibroblast cells around the TheraCyte. (b) Immunohistochemical stain reveals the presence of iPTH-positive cells in the TheraCyte (x132) 3 months after implantation of the TheraCyte-encapsulated $4x10^7$ live parathyroid cells. There are fewer iPTH cells 3 months after implantation than 1 month after implantation (Fib. 2b).

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Human Papillomavirus 16 E7 DNA and E7 Protein Expression in Chinese Colorectal Carcinoma Patients

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Abstract Background The relationship between Human papillomavirus (HPV) 16 infection and the natural course of colorectal adenocarcinoma has not been fully defined. In this study, to investigate the correlation between HPV 16 infection and colorectal carcinoma HPV 16 E7 DNA and E7 protein were observed in 106 patients with primary colorectal adenocarcinoma. **Material and methods** 106 patients with primary colorectal adenocarcinoma were enrolled in this study. Fresh tissues were taken from both the tumors and the adjacent normal area of each patient. HPV16 E7 DNA and E7 protein were detected using polymerase chain reaction (PCR) and immunohistochemistry (IHC). **Results** HPV16 E7 expression was significantly higher in colorectal carcinoma (48/106) than that in adjacent normal mucosa (7/106)（P<0.001）. A correlation was found between HPV16 E7 mRNA expression and tumor locations，4/17 in the ascending colon carcinoma and 25/42 in the rectal carcinoma (P<0.05). Higher HPV16 E7 mRNA expression was also associated with lower Dukes stages（Dukes stages between A and C, P<0.05）. IHC shows HPV16 E7 oncoprotein expressed in the nucleus of both tumor and normal mucosal cells. There was a correlation between the expression of E7 oncoprotein and E7 gene. **Conclusions** Our findings indicated that there was a correlation between colorectal adenocarcinoma and HPV 16 infection. HPV16 infection was relatively higher in the colorectal carcinoma and rare in the adjacent normal mucosa. Specimens expressing higher levels of HPV 16 E7 DNA were associated with lower Dukes stages and more distal locations.

Introduction

The correlation between human papillomavirus (HPV) infection and the occurrence and development of tumors has been a focus of study in recent years. Previous studies showed that HPV, especially the HPV 16 viral genome and antigen expressed in the colorectal tumors (Komlos, Kocjan et al.; Kirgan, Manalo et al. 1990; Lee, Leu et al. 2001; Audeau, Han et al. 2002); (Burnett-Hartman, Newcomb et al.) But the results are controversial in different studies. These following may be the causes: different methods of detections; different primers or probes; different sources or numbers of specimens. To clarify the relationship between colorectal adenocarcinoma and HPV 16 infection, a prospective case control study was performed with a magnitude of samples. In this study, 106 patients with primary colorectal adenocarcinoma were collected. Fresh tissues were excised from both the tumors and the adjacent normal mucosa (10 cm away from the tumor border) of the same patient. The expression of HPV16 E7 DNA and E7 oncoprotein were detected using PCR and IHC.

Materials and methods

Patients and Samples: One hundred and six patients with primary colorectal adenocarcinoma, age range 26-81yrs, medium age 56yrs, male/female, 62/44, were collected at the Department of General Surgery, West China Hospital. All the patients had not been treated with chemotherapy, radiation therapy and immunotherapy before operation. Samples were excised from both the tumors and the adjacent normal mucosa (10 cm away from the tumor border) in each patient. Total 212 clinical samples were collected during primary surgery. Immediately following the resection, both cancer tissues (2 samples of each patient) and normal mucosa tissues (2 samples of each patient) were rinsed with sterile 0.9% NaCl solution. Preserve one sample at -70°C for HPV DNA analysis. The other, used for IHC and H&E stained, was formaldehyde-fixed and paraffin-embedded. Tissue sections from all the patients were reviewed by one pathologist, and the diagnoses of all the 212 specimens were reconfirmed histologically.

DNA extraction

DNA was extracted from tissue specimens by a routine procedure of proteinase K digestion and a standard phenol-chloroform-isoamyl alcohol extraction technique (Pattillo, Hussa et al. 1977)**.** DNA was quantified and qualified using ultraviolet spectrophotometry and electrophoresis.

Primers and PCR Protocol

The HPV-16 E7 specific primers were used in our study. The primers were designed after a thorough search of the HPV 16 sequence database (Los Alamos National Laboratory). HPV16 E7 primers: forward primer 5'-CAC GTA GAG AAA CCC AGC TGT AA-3'; reverse primer 5'-GCA GGA TCA GCC ATG GTA GAT T 3' (manufactured by Shanghai Sangon Bioengineering Co.). These primers yielded 297-bp fragment for the HPV 16 E7 sequence. It is the equivalent of 562-858th in the HPV 16 primitive sequence.

PCR amplifications were performed exactly as described previously (Ding, Zhang et al. 2005). Reaction mixes (30μl) contained 0.5 µl of 5 µM forward and reverse primers, 1 µl of template nucleic acid, and 1 U of Taq DNA polymerase (Sigma-Aldrich Co Ltd, Poole, Dorset, UK). 35 cycles of PCR were performed (95°C for 5 min, 94°C denaturation 30 sec, 55°C annealing 30 sec, and 72°C elongation 1 min). The last cycle was followed by a final extension step of 7 min at 72°C. All reactions were performed on a MJ PTC-100 thermal cycler. PCR products were electrophoresed on a 2% agarose gel and stained with ethidium bromide. The UV-illuminated gels were photographed with Polaroid negatives (type 665). DNA from the Caski cell lines was used as a positive PCR control to assess the success of the amplification. PCR reagents without DNA template (no sample added) served as a negative control.

Immunohistochemistry (IHC)

Immunohistochemistry was performed on 4 μm sections with the streptavidin–biotin–peroxidase technique, as reported previously [1]. Antigen retrieval was performed with heat-induced epitope retrieval with 10 mM citrate buffer (pH 6.1). Tissue sections were incubated with a mouse monoclonal antibody against HPV16 E7 oncoprotein (Sc-6981, Santa cruZ, USA) at a 1:100 dilution. The HPV16 E7 antibody was visualized with the avidin-biotin-peroxidase technique (DAKO LSAB kit; DAKO Cytomation, Carpinteria, USA), Stained with 0.02% 3, 3' diaminobenzidine tetrahydrochloride. We examined HPV16-containing cervical carcinoma specimens as a positive control, and used phosphate buffered saline instead of primary antibody as the negative control. Brown staining of the nucleus and perinucleus indicated positivity for HPV 16 E7 oncoprotein. If the brown stained nuclei account is more than 10% on each of the 5 amplification fields（100×）, the sample is regarded as HPV 16 positive.

Statistical analysis

All data were analyzed using Statistical Package software (SPSS 11.0). Chi-square analysis was conducted. If p<0.05, it is a statistical significance.

Results

HPV16 DNA expression and the correlation analysis

The DNA was extracted from the sample of patients and amplified by PCR. The PCR products were detected using electrophoresis (Fig.1). HPV16 E7 fragments were shown a clear band of about 300 bp.

HPV16 E7 expression was significantly higher in colorectal carcinoma, 45% (48/106) than that in adjacent normal mucosa, 7% (7/106), (p<0.001） (Table 1). Among them, 4 cases of rectal cancer and 3 cases of sigmoid colon cancer were HPV16 positive in both the tumors and the adjacent normal mucosa. A correlation was found between HPV16 E7 expressions and tumor locations，24% in the ascending colon carcinoma and 60% in the rectal carcinoma (p<0.05). Gradually increasing tendency from the cancer site of caecum to anal manifested itself (Table 2). Higher HPV16 E7 expression was also associated with lower Dukes stages (Dukes stages between A and C, p<0.05) (Table 3). The differentiation degrees of colorectal carcinoma had no relation to the positive rate of HPV16. There were two well-differentiated adenocarcinomas in our experiment, which were negative of HPV16 E7. Expressions of HPV16 E7 in moderate and poorly differentiated colorectal carcinoma were 45% （34/76） and 50% （14/28）. There was no significant difference.

Table 1. Expression of HPV 16 in colorectal adenocarcinoma and normal mucosa

Samples	Positive(cases)	Negative(cases)	Positive Rate (%)
Adenocarcinoma	48	58	45
Normal mucosa	7	99	7**

**p<0.001, vs. colorectal adenocarcinoma.

Table 2. HPV prevalence according to anatomic location of tumors

Anatomic Location	Positive(cases)	Negative(cases)	Positive Rate (%)
Ascending	4	13	24
Descending/transverse	6	14	30
Sigmoid	13	14	48
Rectum	25	17	60*

* p =0.012, the rectal carcinoma vs. the ascending colon carcinoma.

Table 3. HPV 16 positivity in colorectal carcinoma

Dukes stage	Positive(cases)	Negative(cases)	Positive Rate (%)
A	5	15	25
B	17	22	44
C	16	13	55*
D	10	8	56

* P =0.036, Dukes stages A vs. C.

HPV16 E7 oncoprotein expression

HPV16 E7 oncoprotein were detected using IHC. HPV16 E7 oncoprotein were expressed in tumor and normal mucosal cells, which is consistent with DNA expression (Fig.2). HPV16 E7 oncoprotein were shown in the nuclear and peri-nuclear of cells.
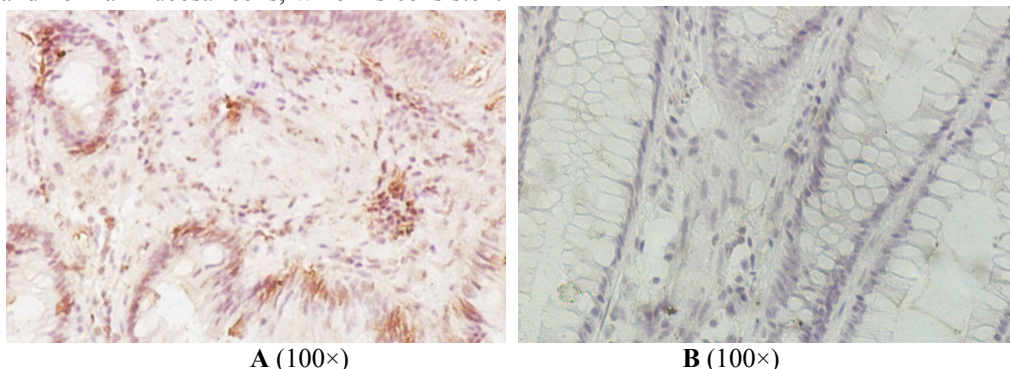
A (100×)   **B** (100×)
Fig.2. The expression of HPV16 E7 oncoprotein

HPV16 E7 oncoprotein were detected using immunohistochemistry. HPV16 E7 oncoprotein were expressed in the nuclear and perinuclear of both tumor and normal mucosal cells (dense brown precipitates). A. Rectal adenocarcinoma, HPV16 E7 oncoprotein positive (100×). B. Colon normal mucosa, HPV16 E7 oncoprotein negative.

Discussion

HPV16 genome is mainly composed of three compartments: early transcribing region (E region), late transcribing region (L region), and upriver regulating region (URR). E6 gene and E7 gene may integrate into the host cellular genome and induce the host cells to be transformed. So it belongs to virus oncogene (Kessis, Connolly et al. 1996). Experimental studies indicated that HPVs, especially HPV16, were one of the etiologies of human cervix and anal squamous cell carcinomas (Frisch, Fenger et al. 1999; Bosch and Munoz 2002). Although various methods were used by different researchers to study the relationship between HPVs and the development of colorectal carcinoma, there are still many secrets to be discovered.

Several technique including IHC, in situ DNA hybridization (ISH) and PCR have been used in recent years to study the relationship between HPVs and colorectal carcinoma. Results indicated that HPV correlated genes and proteins could be found in the colorectal adenocarcinoma tissues (Kirgan, Manalo et al. 1990; Cheng, Meng et al. 1993; Frisch, Glimelius et al. 1997; Lee, Leu et al. 2001; Audeau, Han et al. 2002). Kirgan detected HPVs antigens (97%) and HPVs DNA (43%) in colorectal adenocarcinoma tissues by IHC and ISH techniques. He thought HPV16 is one of the etiologies of colorectal carcinoma (Kirgan, Manalo et al. 1990). Audeau did not find HPV16 expression in 20 paraffin fixed specimens of colorectal cancer using IHC technique and believed that IHC has a high specificity but low sensitivity (Audeau, Han et al. 2002). PCR is used to detect the HPV DNA. Shah KV examined HPV sequences of DNA in 50 colorectal tumors by PCR, using HPV consensus L1 primers for

amplification and found all tumors DNA were negative for HPV sequences (Shah, Daniel et al. 1992). Positive rates of HPV infection in the researches are far from consistence. This may be caused by the methods of detection, the source and amount of specimens. PCR technique has the higher sensitivity than IHC and ISH techniques. Different primers or probes were used. HPV16 DNA usually integrates with the genome of cancer cells. After integrating, only E6 and E7 genes are reserved while other genes are mostly lost or strayed. If sequence other than E6 or E7 are chosen as primers, HPV16 is hard to be detected and the positive rates will be lower (An and Fleming 1991). Additionally, fixed specimens wrapped in paraffin results in destroying the integrity of the DNA and protein and thus a negative result comes out (Steinau, Patel et al.). We employed a magnitude of specimens for prospective control study. 106 patients with primary colorectal adenocarcinoma were enrolled in this study. Samples were excised from both the tumors and the adjacent normal mucosa (10cm away from the tumor border) of the same patient. PCR and IHC were applied to detect the expression of HPV16 E7 DNA and viral protein.

HPV16 infection in colorectal carcinoma and the adjacent normal mucosa

McGregor found that HPV existed in colonal adenocarcinoma by using IHC, PCR and Southern blotting. The positive rate was 32% (13/38), while only 2 positive in 24 normal mucosal tissues (McGregor, Byrne et al. 1993). Frisch found the HPVs DNA expression was 86% in 386 anal cancer, but no expression in 20 rectal carcinoma (Frisch, Glimelius et al. 1997; Frisch, Fenger et al. 1999). Cheng, using PCR and Southern blot hybridization technique, found that HPV positive rate was 29.7% (11/37) in colorectal adenoma and 52.9% (37/70) in colorectal carcinoma, whereas all normal mucosa were negative (Cheng, Meng et al. 1993).

HPV16 E7 is the more potent oncogene in anal cancer caused by HPVs. (Thomas, Pitot et al.) We employed fresh samples (colorectal adenocarcinoma and adjacent normal mucosal tissues) collection during operations and selected E7 gene as primer in our study. Our results indicated that the positive rate of HPV16 E7 in colorectal cancer tissues was 45%, and that of normal mucosal tissues of adjacent carcinoma was only 7%. These suggest that HPV 16 infection may be the etiology of colorectal adenocarcinoma. To further understand the role of HPV 16 DNA in colorectal carcinogenesis, Cheng transformed HPV16 DNA from colonic cancer cells into NIH3T3 mouse cells and suggested that HPV16 might be associated with the malignant transformation of colonic cells (Cheng, Meng et al. 1993).

The correlation between HPV infection and the locations of colorectal carcinoma

Cheng found that there was no relation between HPV infection and the locations of colorectal carcinoma by PCR (Cheng, Sheu et al. 1995). While Weinberger's study indicated that the closer to anus the higher rate of HPV infection. The difference was significant (Weinberger, Yu et al. 2004). We found that the positive rate of HPV16 E7 was much higher in the group of rectal cancer than that in the group of ascending colon cancer (60% to 24%). Gradually increasing tendency of the cancer sites from caecum to anal could be seen. We believed that the reason for this distribution was related to sex, which induced retrograde infection from the perineum to the lower gastrointestinal tract. Thus, chances of contamination of HPVs in the sites of rectum and sigmoid flexure were much more than that in transverse or ascending colon.

The correlation between Dukes stage /cell differentiation and HPV infection

Few reports about the relationship between Dukes stages /cell differentiation of colorectal cancer and HPV infection are found. Cheng believed that there is no correlation between those factors (Cheng, Sheu et al. 1995), while Weinberge found that the lower Dukes stages were always associated with the higher rate of HPV infection (Weinberger, Yu et al. 2004). Our results showed that the differentiation degrees of colorectal carcinoma had no relation to the positive rate of HPV16. As to Dukes stages, significant difference can be seen between stage-A and stage-C ($p<0.05$). Higher HPV16 E7 expression was associated with lower Dukes stages.

Conclusions

HPV16 infection exists in about half of the cases of colorectal adenocarcinoma, and is associated with lower Dukes stages and more distal locations. Yet is it the outcome of HPV DNA integrating into host gene after virus infection, which results in the occurrence and development of colorectal cancer? Or is it an "accompanying infection" induced by HPV invading the damaged site of colorectal mucosal which was the outcome of the tumor tissue death and shedding during its development? Do HPVs accelerate the growth of the tumor after the tumor tissue is infected with HPVs? Further studies are needed to answer these questions.

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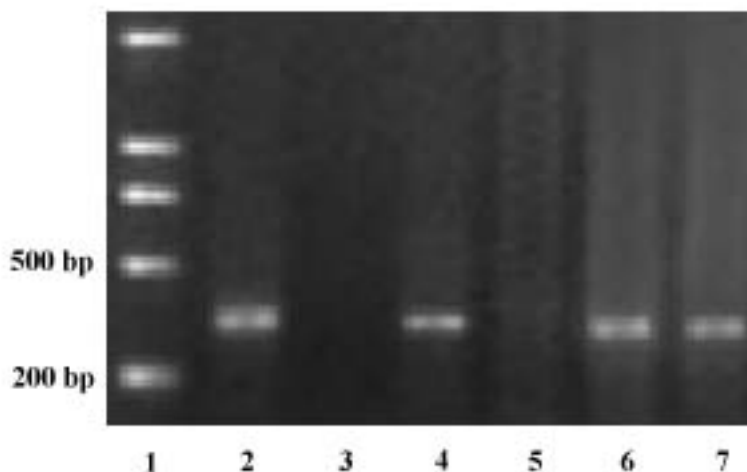Tel: 86-15153610766; Fax: 86-536-8567177

Fig.1. Electrophoresis patterns of HPV16 E7 DNA PCR products.
Lane 1: Markers；Lane 2: CaSki cell lines; Lane 3: Negative control; Lane 5: Rectal normal mucosa; Lane 4, 6, 7: Colorectal adenocarcinoma from different patients.

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Socio economic determinants of use of indigenous fallow system for enhancing soil fertility among farmers in Oyo State Nigeria

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Abstract: Many researches have been conducted to improve fallow system, and the results disseminated to farmers. Notwithstanding these, farmers still use their Indigenous Technical Knowledge (ITK) in fallow practices to achieve approximately the same result with scientific method. This is why this research examines the factors that are related to the use of indigenous knowledge on fallow practices by small-scale food crop farmers in Iseyin Local Government Area of Oyo State. The findings show that majority of the farmers were above 40 years with no formal education and still practice indigenous fallow system despite their contact with extension agents. It was also found that the use of Indigenous Knowledge on fallow practices have strong relationship with fanner's age, educational level, social participation, contact with extension and sources of information. These variables however could explain 58 per cent of the variation in indigenous knowledge use on fallow practices adopted respectively by farmers. Significant determinants were age (t = 1.61), gender (t = 2.65), household size (t = 2.06), marital status (t = 1.65), social participation (t = 2.82), farm size (t = 1.89), farming experience (t = 2.65) and income (t = 1.73).

Keywords: Socio economic indigenous, fallow system, soil fertility, farmers

Introduction

It has been established that formal institutions of Agricultural Research and Extension are not the sole agents of innovation and dissemination (Roling, 1988; Chambers et al 1989). Most agricultural technologies in the world today were developed by fanners and not by (formally) educated scientists (Henkes, 1992). Farming systems based on these technologies provide the food for the majority of the world's population. However, the wrong notion that the local people in developing countries, especially the non- literate rural dwellers, have nothing to offer as solutions to their problems led to the neglect of indigenous knowledge systems of the local people. These people assumed to be ignorant and fatalistic have actually developed strategies to solve their own problems. Indigenous knowledge was described as local knowledge gained from fanners with respect to certain farm activities (Chambers et al 1989). It was also defined indigenous knowledge as local information made available through local people (Richard, 1995). Indigenous knowledge represents the accumulated experience, wisdom and know-how unique to cultures, societies, and for communities of people, living in an intimate relationship of balance and harmony with their local environments. These cultures have roots that extend into history beyond the advent of colonialism. They stand apart as distinctive bodies of knowledge, which have evolved over many generations within their particular ecosystem, and define the social and natural relationships with their environments. They are based within their own philosophy and cognitive system, and serve as the basis for community-level decision-making in areas pertaining to governance, food security, human and animal health, childhood development and education, natural resource management, and other vital socio-economic activities.

It is embedded in community practices, rituals and relationships (Emery, 2000). A number of development programmes seek complementarities between IK and external knowledge such as ILEIA- the information centre knowledge communities, worldviews and sciences on Low External Inputs and Sustainable Agriculture, and ISWC, the programme on Indigenous Soil and Water Conservation) These programmes have shown to be effective to the extent that complementarities and synergy can indeed be realized (Reijntjes et al 1992). Indigenous knowledge was defined as local knowledge that is unique to a given culture or society (Warren, 1991). Many efforts in agricultural development today are aimed at improving the economic position of the farmers and not to discover why they behave as such. West African food crop producers are inventive but development agencies rarely accept this innovativeness because they misunderstand the nature of both the agriculture and the politics of communities where food production is a major interest (Richard, 1995). In the case of the farmer, the process of knowledge formation is the result of his observations of natural conditions over time and what he has been told by other farmers. Thus, Gupta (1993) acknowledged that no society could ever hope to achieve a long-term goal of sustainable development unless it builds upon its own knowledge tradition, ethical foundations, and technological endowments. Through a process of innovation and adaptation, local farmers have developed different fanning systems, each of which fit into their ecological, economic, socio-cultural and political environment and acknowledged even by researchers to be functional and worth preserving (Reijntjes et al 1992). The priority of the resource poor farmers is to ensure survival and security in an unstable and fluctuating environment, while the

researcher's goal is to get maximum yield per unit area of land. Hitherto, mono-cropping was adjudged by the researchers to be the ideal way of crop cultivation and was handed down to fanners without any consideration for the peculiar peasant farmer's production environment. However, the traditional practice of mixed cropping which was considered unscientific has been found to be convenient and suitable for the peasant farmer's production environment (Chambers et al 1989).

Scholars have reported ITK association with the environment (Ellen 1996), agricultural practices (Brush 1992), in situ conservation and management of genetic resources (Hammer et al 1991), communal resource management institutions[13], and tenure arrangements and resource allocation9 Berkes 2002). Agro-ecologists visualize traditional systems as unique opportunities to study the perspectives of stability and sustainability and to get ideas for agro-ecosystem management (Altieri and Merrick 1987). In Nigeria indigenous soil taxonomy provides the base for agricultural decision-making (warren and Rajasekaran, 1993) and folk biological taxonomy in plant genetic resource conservation, and in Guatemala and Peru forest conservation activities incorporate traditional sustainable harvesting methods (Salick, 1992). Similarly, in Namibia the WWF has demonstrated the use of traditional knowledge in community based resource management, creating a win-win situation between economy and environment (AFROL, 2003). In many parts of the world, women farmers are most knowledgeable about natural resources because of their constant close interaction with them (Samal and Dhyani, 2006). Women farmers in resource-poor marginal farming systems have deep knowledge that includes ecological, agronomic and consumption characteristics about local landraces, crop improvement, agricultural practices, and the entire value chain and environment. It is argued that in traditional agricultural communities, this experiential knowledge gave women an important role in decision-making both at the family and community levels, consequently contributing to equitable power relations between genders (Rengalakshmi, 2006). The changing socio-economic and political systems in the agricultural domain influence the relevance of traditional knowledge, widen the gap between culture and traditional knowledge, and make the knowledge less relevant to the context. In particular, indigenous knowledge provides local farmers with the basis for agricultural decision making (White et al, 2006). Indigenous knowledge systems offers great prospects for effective integration of strategies that will be attractive enough to the vast majority of small-scale local farmers (Oladele and Braimoh, 2010): use of zero tilling practices in cultivation, and mulching, as well as other soil management techniques (Osunade, 1994). Local farmers are known to have practiced a fallow system of cultivation, which encouraged the development of forests. Farmers, through their familiarity with and use of local knowledge, can determine when the soil is exhausted by examining the

water retention level, which reduces substantially (becomes too porous), the plants/crops or weeds are stunted and yellowish, and the crop yields decline at an increasing rate. Decline in soil fertility is also determined by evident loss of crumb structure. It also becomes very light, dusty or sandy in texture. The soil colour changes from dark or brown to reddish with increased number of stones. When soils are exhausted, this allows the growth of certain weeds.

It has been established that the indigenous knowledge of the people is not static but dynamic and is disseminated through informal communication sources such as word of mouth, village meetings, initiation rites, etc. and become internalized as part of the indigenous knowledge system. *As* new experiences are gained others lose their relevance because of changing circumstances and needs. The capacity of farmers to manage change is also part of their indigenous system thus; indigenous knowledge can be seen as a dynamic and ever-changing accumulation of the collective experience of generations. To further understand the concept of indigenous knowledge system, this research was designed to examine socio-economic factors that are related to the use of indigenous knowledge on fallow practices by small-scale food crop farmers in Iseyin Local Government Area of Oyo State, Nigeria

Materials and Methods

The study area is located in the derived savannah area of Oyo State. Five villages were selected because of the high concentration of food crop farmers. These are Paago, Otiri, Ajepero, Okeamu and Ipapo. On the whole 100 households were randomly selected from the household heads listings that were aged 30 years and above were interviewed because of their level of indigenous knowledge, based on their long years of experience in farming and agricultural productions. Data were collected using a structured questionnaire which contained open and close-ended questions that elicited information on socio-economic characteristics, use of indigenous technical knowledge and fallow practice. The researcher also used participant observation to obtain qualitative data.

Results

The results of the study are presented in Tables 1 and 2. Table 1 shows the percentage distribution of farmers according to personal characteristics and use of indigenous fallow system and Table 2 presents the socio-economic determinants of use of indigenous fallow system among farmers.

Discussion

This section is made up of three parts, these arc demographic, indigenous knowledge and fallow practices. Table 1 shows the demographic characteristics of respondents. Majority of the respondents (65%) were 40 years and above, while 44 per cent were below the age of 40 years. This is expected to enhance the study findings, as farmers of this age bracket will be good sources of indigenous knowledge system and its use. Eighty-four per cent were male farmers; this indicates the dominance of

fanning by male, since most Yoruba women are more likely to engage in off-farm income generating activities. Ownership of farmlands by some cultures in the opinion of (Olawoye, 1993) is strictly that of the males alone, although women are allowed to perform numerous farm operations. Many of the respondents (83%) were married; this stresses the need for labour that is often raised through families in the rural Yoruba setting. Of the 83 percent that were married, 57 per cent of the males had between one and two wives, while 24 per cent had more than four wives showing that polygamy still prevails. The number of wives and children are often used as indicators of the socio-economic status of the husband and consequently predict the farm size. This explains why 62 per cent of the respondents had more than five children (Table 1).

Table 1: Percentage distribution of farmers according to personal characteristics and use of indigenous fallow system (n = 100)

Variables	Percentages
Age	
40 years and below	44
41-50	45
51-60	8
Above 60	3
Gender	
Male	84
Female	16
Marital status	
Single	15
Married	83
Separated	2
Number of wives	
1-2	57
3-4	19
Above 4	24
Number of children	
1-3	38
4-6	42
Above 6	20
Religion	
Christianity	46
Islam	42
Traditional	12
Primary Occupation	
Farming	76
Trading	17
Hunting	7
Educational level	
No formal education	64
Adult education	9
Primary education	7
Secondary education	7
Above secondary education	13
Use of indigenous fallow	
Yes	80
No	20

Table 2: Socio-economic determinants of use of indigenous fallow system among farmers

Variables	Reg. Coefficient(SE)	t
(Constant)	82.1(16.5)	4.98**
Age	0.45(0.28)	1.61*
Gender	5.12(1.93)	2.65**
Household size	2.53(1.23)	2.06**
Educational level	-0.05(0.10)	0.50
Religious beliefs	2.63(4.66)	0.56
Marital status	4.80(2.91)	1.65*
Social participation	0.79(0.28)	2.82**
Information sources	0.17(0.12)	1.42
Farm size	0.34(0.18)	1.89*
Extension contact	0.23(0.53)	0.43
Farming experience	1.14(0.43)	2.65**
Income	1.90(1.10)	1.73*
R	0.76	
R^2	0.58	
F	2.49	
p	0.05	

*Significant @0.05, **Significant @0.01

Such large family size is seen as an economic boom as they arc major source of rural labour (Adegeye and Dittoh, 1985). The religion of the farmers studied is an indication of what indigenous system would be. Twelve per cent of the respondents were traditional worshippers, while 42 per cent and 46 per cent were Moslems and Christians respectively. About 76 per cent were into farming as primary occupation, while the remaining 24 per cent who were engaged in other occupations such as trading, hunting and weaving, practiced farming as secondary occupation. However, 64 per cent were without formal education, while the remaining 36 per cent had a bit of formal education. Increased level of education is expected to expose the farmer to more sources of information other than localizing on the oral tradition of ITK that is common in the area.

Regression analysis was used to ascertain the amount of variation explained in the use of indigenous knowledge and fallow practices. Indigenous knowledge and fallow practices being dependent variables were regressed on socioeconomic characteristics as independent variables. The independent variables include: Age of respondents, gender, household size, educational level, religious beliefs, marital status, social participation, sources of information, farm size and contact with extension agents.

The results of multiple regression analysis of relationships between farmers' socio-economic characteristics and use of indigenous fallow system are presented in Table 2. The independent variables were significantly related to use of indigenous fallow system, with an F value of 2.49, $p < 0.05$. Also, R-value of 0.70 showed that there was a strong correlation between independent variables: and use of indigenous fallow system. The results accounted for 58% of the variation

for use of indigenous fallow system by farmers. Significant determinants were age (t = 1.61), gender (t = 2.65), household size (t = 2.06), marital status (t = 1.65), social participation (t = 2.82), farm size (t = 1.89), farming experience (t = 2.65) and income (t = 1.73). It implies that as farmers aged, and farming experiences and household size increased, more use of indigenous fallow system by farmers. It was reported that as farmers aged; with long years of farming experience with household sizes increasing the more use of indigenous knowledge (Kuponiyi and Bamigbose, 2009). Also, the gender of farmers is significantly related to the use of indigenous knowledge as the Yoruba traditional culture discriminated between male and female in terms of information and farming practices. Marital status and social participation are significant due to the fact that these could be sources of information on indigenous practices. In many parts of the world, women farmers are most knowledgeable about natural resources because of their close constant close interaction with them (Samal and Dhyani, 2006). Similarly, Rengalakshmi (2006) noted that women farmers in resource- poor marginal farming system have deep knowledge that includes ecological, agronomic and consumption characteristics about local land races, crop improvement and the entire value chain and environment. The significance of farm size and income may be due to the fact that the use of indigenous fallow system is sustainable and practicable on the average farm size usually found among small scale farmers and would lead to cost reduction on crop production. The use of indigenous knowledge led to low cost investment in farming and higher productivity among farmers in Cameroon (Toyang, 2003). Similarly, Ayoola et al (2007) reported high benefit over cost among farmers using indigenous methods of treating animal diseases in Nigeria. The study concludes with the assertion that indigenous technical knowledge is a widely used practice. It is therefore apparent from the study that for technologies generated to be adopted by farmers, the local farming practices have to form the basis of technology development and transfer.

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Legal study of Foreign investment in the Persian Gulf

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Abstract: Persian Gulf area has a length of 600 miles that separates Iran from the Arabian Peninsula. This area is one of the world's most strategic waterways in the slimmest point 34 miles wide. The region is called Persian Gulf, covers eight countries, including Iran, Iraq, Kuwait, Saudi Arabia, Bahrain, Qatar, UAE and Oman is Arabic.
The region's role as a trading route of ancient times began. The role of the large expansion of imperial power in the West as the ancient Achaemenian, Greek, Parthian, Roman and Sassanid became more important. When his rule over the Arabs throughout the Middle East, Persian Gulf Stranded role in commerce and communications with organizations around the center of renewed and built. The expansion of European powers in the Orient as a strategic political competition Persian Gulf, as a highway of commerce, as well as an important link they were interested in the strategic chain. From 1908, when the first oil well in Iran, the Persian Gulf began in the New World. Today, the global significance of the vast energy resources of the region that has the largest reserves in the world and lies, the existing energy reserves in other parts of the world is going to end. Another factor that adds to the importance of this area, given the extent possible oil production is exported. Persian Gulf has huge reserves of oil. Countries around the Persian Gulf in 2003 to nearly 718 billion barrels of proven crude oil reserves had more than 62% of the global reserves of crude oil. About 70 trillion cubic meters of gas that nearly 40% of global natural gas reserves in the area in the area there.

Introduction:

With predictions that this result was none of the existing or future energy, oil and gas soon is able to replace or even be superior position, Oil is expected that between 26 and 28 percent of global energy demand in 2020 will provide. Looking at the comparative costs of energy production, it is clear that oil has the lowest cost among other sources, according to Shell Group in 1979 and 1983 indicated that the cost of alternative energy, fossil energy, such as coal and natural gas even whether domestic or imported to the United States and Northern Europe and Western Europe have increased by about 36 percent [1].

According to the energy balance in the first place seems to be the position of the world's oil reserves remain for the next few years.

Total oil and gas in 1973 was 58 percent, in 1984 the rate of 1/59 per cent, in 1986 58%, in 1988, the 51/1 percent of the world's total energy is allocated and scheduled average in 2000, The 49/3%, and in 2020 the 43/4 percent, based on a limited schedule in 2000, the 49/7%,

And in2020 the rate of 44/1% share of the world's energy will account have some control, which is the second strategic goal.

Having a large inventory of oil and gas in the Persian Gulf region, one of the most sensitive areas of the world's energy geopolitical perspective dependent countries, especially the industrialized world and in future it will increase and America and Russia are the world powers,

and particularly the special attention and control, it is one of their strategic goals.

The world's known reserves of the Persian Gulf region in 1988, the amount of 649,655 million barrels of oil are saved 65/5% of world reserves are included, and the bulk of the 25/7 percent of world reserves are located in Saudi Arabia[2].

Persian Gulf region with 31010/17 million square meters of natural gas, about 27/7 of the world's known reserves of natural gas is available; the bulk of the country is about 14 percent of global reserves. Oil in the Persian Gulf to East Asia, and Japan and Australia and are exported to Western Europe and North and South America. In the years 1977 to 1980 the industrialized world's dependence on oil from the Persian Gulf region was very high, So that

America is more than 30% Western Europe and Japan, more than 70 percent and more than

60 percent oil needs be provided to the Persian Gulf.

Persian Gulf's strategic location

Persian Gulf as a blue sea, with 565 billion barrels of oil Equivalent to 63% of the world's known oil reserves, and 30/7 trillion cubic meters of natural gas, equivalent to 28/5% of the world's known gas reserves, Certainly the greatest and most important is the energy storage.

The figures suggest that a significant proportion of the world's proven reserves of oil and

Natural gas in the region is located in the Persian Gulf.

In other words, about two-thirds of the world's proven reserves of oil and natural gas reserves, a quarter of the world lies in the region [3].

Special status of Persian Gulf oil and gas reserves as well as having strategic location and its importance as an appropriate market economy, political changes in recent years have focused the world's attention to the area of Persian Gulf since World War II has played an influential role in the world economy. Modern industrial wheels of the Industrial Revolution in Europe and Japan to America by the flow of Persian Gulf oil accordingly. The economic system of the West with the help of today's technology and advances in oil countries in this region could be In addition, oil companies, especially American companies Have earned huge profits and large. Persian Gulf in the Middle East, which is areas of special geopolitical model, offers a unique Geopolitical region. This region includes people from a different culture, but the concern that the political, strategic and economic harmony and homogeneity Are many .This area includes Iran, Iraq, Saudi Arabia, Oman, Kuwait, United Arabic Emirates, Qatar and Bahrain. Pakistan is also due to geographical proximity and extensive exchange trading is great interest in this area, so it can continue to be Persian Gulf geopolitics. Pakistan is also due to geographical proximity and extensive exchange trading is

great interest in this area, so it can continue to be Persian Gulf geopolitics.

In addition, hostility and lack of historical relations with Arabic countries and the history of relations between Iran and the government has not succeeded the way for Iran's enemies have opened in the area. Persian Gulf countries that the problems are mainly political, social, economic and underlying structural problems facing the insecurity and instability in the region. This external actors have the opportunity to play a major role in the Persian Gulf has. Direct presence of foreign agents, plays a major role in the region has a lot of consequences be. The basic problems of economic and infrastructural also are added. Perhaps the major reason why most shoppers and customers Arms of America, the Persian Gulf oil states are. To achieve military and strategic superiority in the Persian Gulf the way into the world of open water and the location of major oil transit. The full proceeds of the policy will be sent to the west and especially America[4].

 Furthermore, identity crisis, social turmoil, inefficiency and incompetence in the leadership among the Arabs and the crisis of legitimacy, ethnic differences within and between tribal politics and religion (and sometimes personal) and the vulnerability of many countries outside area, hands up the weakest part of the Arab nation - states in the world to come. Direct presence of foreign agents, the outcome of the internal situation and the reform of the international role of the internal situation in this region can be reduced. Thus, the main cause of insecurity, instability and non alien presence in the region due to internal problems and direct Brand region and not necessarily to eliminate the effect should be eliminated because it The basic problems of economic and infrastructural also be

added. Perhaps the major reason why most shoppers and customers arms of America, the Persian Gulf oil states are. To achieve military and strategic superiority in the Persian Gulf the way into the world of open water and the location of major oil transit. America and Israel under these conditions Stand natural process of destroying the local economy and the region continues to rely on petro-dollars. The full proceeds of the policy will be sent to the West, and especially America.

Furthermore, identity crisis, social turmoil, inefficiency and incompetence in the leadership among the Arabs and the crisis of legitimacy, ethnic differences within and between tribal politics and religion (and sometimes personal) and the vulnerability of many countries outside area, hands up the weakest part of the Arab nation - states in the world to come. Direct presence of foreign agents, the outcome of the internal situation and the reform of the international role of the internal situation in this region can be reduced. Thus, the main cause of insecurity, instability and non alien presence in the region due to internal problems and direct brand region and not necessarily to eliminate the effect should be eliminated because it .Foreign direct investment reasons and motives will be different. The most important of these factors can be listed as follows [5]:

1 - And earn higher returns and risk aversion due to the higher growth rate of the foreign country, or to obtain favorable tax treatment and the use of an advanced economic structure.

2 - Horizontal integration (foreign produce a homogeneous product is produced within the country in which distinguished be).

3 - Vertical integration (control and use of raw materials with the least cost and the lack of

Concern from the reduced supply of raw materials).

4 - To avoid tariffs and other trade restrictions on imports from other countries those have imposed.

5 - To obtain benefits from various subsidies that the government pays to encourage foreign

Direct investment.

6- Entering a foreign oligopoly market share in the profits.

7- Buying a foreign company owes its future to avoid competition.

8- Avoiding a potential loss of export markets.

After World War II, the two causes very rapid progress in the transportation industry The telecommunications industry is highly developed and Foreign Direct Investment Because of these developments facilitate Branches in direct control of a company's worldwide operations But investment in addition to economic variables, qualitative variables affects the economic well being. Unlike most economic variables, these variables are quantitative, qualitative and more under the influence of political structures and the relationship between economic and Political factors. Whether the qualitative variables are [6]:

A) Political security in every community.

B) Arrangements for property rights.

C) Democracy and Civil Liberties.

D) The administrative system and bureaucracy countries.

E) Judicial and criminal.

F) The speed of handling cases in courts.

Overview of risk analysis is essential to understanding the major risks in our business.

1- Interest rate risk:

Interest rate risk is related to the interaction of the capital market and interest rate fluctuations

On financial market distortions in an economy are measured.

2- Purchasing power risk:

Due to inflation risk that the investor will be applied. But since the rate of inflation as a price index and the consumer price index price index conventional 1 (CPI) is used to measure inflation. Therefore, investors should invest in the project at least (inflation rate +) to compensate, because if not, the purchasing power of investors in the year ahead inflation rate Inflation rate +) is reduced.

3- Risk Management

Although many firms have a large income and a lot of strength in the market, but the wrong decisions there is a mistakes of the firm by those who harm firm, and the project harm have an investment's invest in any project for any investor who is not involved in the management of these risks is due to errors in decision making, the project loses.

4- Liquidity Risk

Cash assets to cash assets are said to be easily and do not have the cash. Non-cash assets for Liquidation expenses must be incurred to sell.

5- Political Risks

Political risks in international investors international investors "all locations" have to face hurdles in its investments in the country are obstacles such as exchange controls, tariffs, taxes, etc. Many of these barriers are due to the political decisions of the country and the international security environment in the country is one of the most difficult international Political risks is internal

6- Industrial Risk

Industrial risks can occur due to events that occur in a commodity industry like in an industry where labor unions to strike. The tax rate increase or an industry Certainly, the process of production and investment risks in an industry affecting.

Foreign Direct Investment in the Persian Gulf

The Persian Gulf littoral states Partly in terms of economic structure and political structure, Are very close together. The most important common point between these countries is very strong dependence the oil is in these economies. These countries are mostly monoculture countries and Exporter of crude oil is much of its revenues from sales of crude oil are produced and thus the economy's dependence on oil revenues is extremely large.

From 1990 onwards, two enormously important impact on the volatility of security as the main component of foreign direct investment, in the Persian Gulf has the first event, the first Persian Gulf War in 1991 and the attack on America and its allies in Iraq.

The second event is related to the terrorist attacks of Sept. 11; 2001.United States of America's pre-emptive strategy to fight terrorism and follow-up in the Middle East, particularly the Persian Gulf region, Negative effects on the stability and security in the Persian Gulf have been attacked [7].

Foreign investment in the Persian Gulf states over time is subject to volatility. Foreign investment in these countries have been affected by extreme political volatility And economic decision-makers in the field of law enforcement trying to provide a safe environment for attracting foreign investment have.

Maximum absorption of foreign capital the economics of oil and gas fields in the Persian Gulf states, Because of the strategic features of these states in energy, respectively.

Refer to the field of International Statistics Attract foreign direct investment Suggests that countries that share the Persian Gulf is very low in this area Despite the region's strategic location and potential In the economic sphere, energy is not as it should be to attract international capital From the perspective of political and economic disadvantage Countries is considered essential for the area. However, according to these figures, In the Persian Gulf region, Saudi Arabia and the United Arab Emirates, located on the first and second place and the most successful countries in attracting foreign direct investment in the region have been and Iran, while in 2005 and 2006 Fifth place in the region, has fallen to sixth place in 2007.

However, due to the volume of Iran's economy and economic potential, Rank lower in foreign investment is highly meditative. It requires special attention and attention to factors determinants of foreign direct investment, international security and stability in the opinion the rights of foreign investors foreign investment and the creation of appropriate substrates, Efforts by the authorities to be plentiful.

Major obstacles and restrictions on FDI It can be pointed out, Attracting FDI involves an imbalance of current domestic and global regions, including extensive foreign investment, lack of compliance with the basic rules of the region, limited range of economic activity in the countries studied, the validity of the acquisition of immovable property, capital commitments are requirements.

On the other hand, Undermine the stability and security in the Persian Gulf region, A decisive role in implementing government policy in this area has had in many aspects. Moreover, the prevailing insecurity in the region, the trigger government intervention in the internal affairs of the countries. The same proportion, the countries of the region, instead of considering investment in social infrastructure such as education, health and social security, which is facilitating the entry of foreign direct investment flows, Will attempt to increase its military spending; Because of the security threats that the international policy of a country feel, most be-It is also the country's military spending will rise This setup measures to boost the

international political risk Investment attractiveness of the region and for international investors greatly lowers.

Importance of trade and investment power in the Persian Gulf

Persian Gulf region, about 679 billion barrels of reserves proven oil (nearly 66% of total world oil reserves, and 1,918 trillion cubic feet of storage gas (35 percent of total gas reserves in the world). Such reserves this region the largest reservoir of energy the world has become. now oil from the Persian Gulf from the six geopolitical regions of Iran, Iraq, Kuwait, Saudi Arabia, United Arabic Emirates and Qatar are all members of OPEC, which produces close to 18/6 million barrels per day.

While the entire world's crude oil comes from Nearly 79/3 million barrels per day. The Persian Gulf oil contributed almost 23% of the oil consumed in the world provides. Global oil consumption in 2020 based on forecast day 111/5million barrels would be Persian Gulf after the global demand for oil will increase and may reach 50 million barrels per day at its 45% share of global oil production will be in the Persian Gulf.

While industrialized countries are now trying with other alternatives such as oil from Russia and the Caspian Basin Resources to reduce our dependence on Persian Gulf But at the same time that the sustainability of energy in Russia, Caspian and other regions of the world will be short compared to Persian Gulf energy resources.

For a decade from 1985 to 1994, the greatest demand Energy is the continent of America And a large part of the energy produced in the foregoing The countries of the subcontinent, particularly in North America is consumed but the situation is different in the coming   years.

According to estimates, by 2020 most of the energy demand in Asian countries Especially in East and South East Asia will and more than three times the amount requested in these countries will demand Inter America.

The formation of this new route makes energy Due to the huge energy resources in the Persian Gulf Planning and marketing Energy is a critical issue for the region. These figures cast of investors and business development Persian Gulf will change in the energy sector, which is too referred [8].

Non-energy investment and trade in the Persian Gulf

Over the past 10 years With oil prices over $ 90 a barrel in the Persian Gulf region's economy has been transformed Economists believe that the best way to prevent swelling In the Persian Gulf region Login money from oil sales venture In this region, the bulk of this investment In other energy.

Economic environment in most countries of the Persian Gulf in total However, the state-owned economic sector and Restrictions on foreign participation and foreign investment restrictions faced. For example, in September 2004, Bahrain and the United States Signed a free trade agreement in which all goods entering the U.S. tariffs were removed to Bahrain The overall agreement with the

Persian Gulf Cooperation Council members, especially Saudi Arabia, faced strong opposition which was noted all member states were committed to the GCC 5% of the common tariff for third parties to establish business[9].

America goals in the Persian Gulf

The fact that the characteristics of the economic, political, cultural, and strategic regional Energy sources, especially the Persian Gulf states of America on the To be present in the region since 1970.The geopolitical and geostrategic region due to its own success always pay attention and look at the history of trans-regional powers, or we nearly a century after the discovery of energy resources, It is not insignificant percentage of today's global economy, where the pulse beats.

A) Economic objectives

What distinguishes the region from other parts of the world oil? The Middle East has the largest energy reserves in the world, 64 percent of the world's oil reserves are in the Persian Gulf belonging to seven countries.

The most important and the largest oil reserves in Saudi 163/2 billion barrels, Kuwait 65/4, Iraq 59, Iran 56, UAE 7/5, diameter 3/7, Bahrain 2/4 is. No oil in five key Persian Gulf (Saudi Arabia, Kuwait, UAE, Iraq and Iran) having about 81% of OPEC reserves, Are major producers and exporters of crude oil.

United States of America with more than 25 percent of world oil consumption will but less than 3 percent of the oil reserves in the world are and Europe, with less than 12 percent of global oil reserves, more than 21 percent of the global consumption of crude oil is allocated. Located on the shores of the Persian Gulf oil-producing countries, Due to the abundance of natural gas reserves, including the resources that it has increased the importance of this region in the Middle East, So that the Persian Gulf states nearly 30 percent of total world reserves are allocated.

This is the case when the influx of big oil companies and cartels In order to explore and extract millions of barrels annually and billions of cubic meters of gas over the following economic benefits for the region to be financial profits for companies in the region. United States during the past decade in various ways to dominate the economic life of the region and despite regional conflicts in the Middle East has been their economic relations as well as in Highest level with countries like Saudi Arabia, UAE and other Persian Gulf states to maintain. Arabic countries in the Persian Gulf region in particular, which for reasons of security concerns and the concerns are Its security ties with the United States to search. So the trade deals with America Can align and political affinity states America is looking for a regional policy.

B) Political and Strategic Goals

Military and strategic importance of the Middle East in terms of proximity to the Atlantic and Indian and Seas like the Mediterranean Sea, Red Sea, Caspian Sea, Black Sea

and the Persian Gulf, has long been considered the center of world power.

Besides the strategic Strait of channels and the Suez Canal, the Strait of Hormuz, the Straits of Bosporus and Darden, and the Strait of Gibraltar Strait of Babb el-eminent role in the Middle East have doubled.

Therefore dominate the region one of the main conflicts in the former Soviet Union and America are two superpowers during the Cold War. Among the strategic areas of the Middle East, Persian Gulf and the Strait of Hormuz waterway and geo-strategic terms is one of the world's fourteen major points. The fall of the Shah of Iran in 1979 and the establishment of the Islamic Republic of Iran, the Persian Gulf security structure has changed altogether, America led to reassess its strategy in the region is.

In fact, America's position in the Middle East with the goal of providing secure and affordable energy through cultural changes in accordance with U.S. regional policies. The biggest obstacle is that of defining the rules of the American people in the area do not. Thus, one purpose of the United States in the region to prevent the spread of Iranian influence in the region. Another of America's presence in the Middle East is looking to secure its strategic ally of Israel and maintain the balance of power in favor of this country.

The United States of America, Israel is a strategic asset and military superiority, it also sees as its national interest. Other goals of America in the Middle East can be controlled to prevent the emergence of rival powers in the region noted. America's foreign policy is its emphasis on overcoming the major powers competing at international level and at regional level.

Americans believe The United States can and must rise to any nation or allying order to avoid becoming a great power. The vast land of China, the central position in Asia, Natural resources and a large population of military power is the power. America has repeatedly expressed concern over China's military power, Through repeated acts of human rights and Other programs seek to limit China's power is derived. Another Russian military rival to the United States Be released if the internal problems can be Again to its former state in Central Asia And Eastern Europe have gathered, The power block is created. After the collapse of the Soviet presence of U.S. forces in the Middle East and the Persian Gulf will provide. It long has been a place of great power and intense competition toothily And the United States with oil contracts, The establishment of military bases in Central Asia and the Caucasus, and also doing exercises to expand the region's political, military and economic.

In fact, America adopted Military approach focused on fighting terrorism and promoting military bases in Afghanistan and then in other countries itself Military power in the Middle East, there is a wide United States is to prevent the emergence of rival powers[10].

Conclusion

Iran as the largest country in the Persian Gulf, Iran for one of the most influential countries in the region, requires that Its geopolitical significance in the shifting global to establish relations with the wide links Persian Gulf countries in depth geopolitical, geostrategic and economic geo identified. America's presence in the Persian Gulf and Invasion of Afghanistan and Iran can cooperate on common interests of the region to strengthen.

In fact, regional integration the only option to deal with America's dominance in the Persian Gulf. United States in order to reach the goals mentioned In order to further highlight Presence in the Persian Gulf and the Middle East will but gradually expand America's military presence in the region was controlled Remove from Persian Gulf countries. And eventually reach the point where that these countries will not have any role in regional security.

 The security of America's military The Persian Gulf region is established Arab countries will not only benefit, but rather Zionist regime's interests Maintaining the overall security in the Middle East is one of America's strategic goals. In such circumstances, the need for collective cooperation Persian Gulf countries to expel aliens on understanding and developing a new system of regional security is felt.

In other words, the Persian Gulf States Convergence in the area of security against future threats and challenges require. The information provided in this article, the following points are important:

The volume of investment and trade in the Persian Gulf after oil prices rise.

1)   The main exporter of goods to the Europe Union is currently in the Persian Gulf. But
China is rapidly competing with the union.

2)   The most important energy-exporting country in the region is therefore a need for more interaction between Iran and Saudi Arabia's energy is felt.

3)   Most of the statistics, Russia and the United States Uncertain economy and the meaning behind the two countries' trade the countries of the Persian Gulf.

4)   The volume of Iranian exports to the United Arabic Emirates is very eye-catching this represents the area of export goods around the world and re-exports to Iran, which should more properly be applied in this policy.

5)   Support the creation and strengthening of private sector companies in the Iranian oil
Industry in regional and global markets.

6)   Support for foreign investment in oil and gas development and production of petroleum and petroleum products.

7)   The use of joint ventures and associated companies in the region or integrated Petroleum Downstream oil and petrochemical industries.

8)   Center for financial services, Goods and equipment for industrial and commercial perform the services required of it for the region And

make required capital investment and financing from international markets The founding member of the financial institutions.

The majority of economists who research issues in underdeveloped countries the lack of capital in these countries, as one of the main factors of growth and development are highlighted. Needs of the Third World and the countries of the Persian Gulf's a member of the club, Not only financing, But international communication and access to technical and technological achievements, Changes in management structure and organization of manpower training needs of other countries.

But not enough to create the conditions for the formation and accumulation of capital development the need to attract investment from abroad in these countries Is an unavoidable necessity. Foreign investment In an economy driven only by economic incentives and In this case, such as profitability and market needs But quiet and stable and reliable Investors in the context of their Confidently plan for the future, Is required. Economic security and because in attracting foreign investment has played a decisive role.

As is Security and political and economic stability of the most important and influential factor in attracting foreign investment is but the performance of Persian Gulf countries in attracting foreign direct investment Due to the specific conditions and characteristics of the area, Among the reasons for the low level of international security and political stability in

These countries, America and its allies in the Persian Gulf War, particularly in the area

Performance has not been successful. Given our country's economic potential and its

Economic size.

Has failed As will be successful in attracting foreign investment and even in comparison with region Which has a much smaller economic size of the economy, they have failed to yield acceptable.

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DEVELOPING THE SOFTWARE PROJECT AND RESOLVING DIFFERENT TYPES OF RISKS ASSOCIATED

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ABSTRACT: Manufacturing industries initiated software as vital role, for an accurate product development and manufacturing, instead of manual operation the system is fully automated and it gives an error less product, to develop software according to the customer need and satisfaction, softwares are developed with the customer specifications, in this article it describes the various risk in the software project development and the solutions to solve the risks. The purpose of the study is to focus on the different types of risks associated with development of a software project, to find out the best way to minimize those risks associated with development of software project and to analyze the impact of the risk factors on the project. A literature review in prominent academic journals in developing the software and resolving the risk associated and it has been conducted for the period 1997-2008. The objective is to collect, organize and synthesize existing knowledge relating to software development and the risk associated in developing the software. The study has described the different types of risks with development of software, the impact of the risk process on the project and finding the best way to minimize those risks with the calculations of percentage analysis and cross tabulation process. The value of this paper is to define the software development and the risk associated to analyze how research in this area has evolved during the period 1997-2008 and to recognize some lines of advance research.

1. Introduction

Risk Management is a method that is used to reduce or eliminate risk before it can harm the productivity of a software project. With only 28% of software projects finishing on time and on budget, risk and the management of risk play an important role in software development. There are two ways that software engineers can handle risk. A reactive software engineer corrects a problem as it occurs, while a proactive software engineer starts thinking about possible risks in a project before they occur.

There are also specific risks associated with team members, customers, tools, technology, time estimation, and team size. Many of these risks can be minimized by the development methodology used for the project. There are many different tools that can be used to analyze the risk apparent in a project and that can help choose the best way to minimize or eliminate that risk.

Table 1- Several Types of Risk That Can Occur During a Software Development Project

RISK TYPE	DESCRIPTION
Generic risks	Generic threats across all projects. For example, requirements change, loss of team members, loss of funding
Product-specific risks	High level risks associated with the type of product being developed. For example: availability of testing resources
Project risks	affect project schedule or resources
Product risks	affect quality or performance of software
Business risks	affect the viability of the software

1.1 STATEMENT OF THE PROBLEM:

Recently it is witnessed that, the IT employees are facing more risk in developing the projects. Starting from the business planning level throughout the software development cycle, the management and employees are facing more risks in the software development projects. Due to those risks, the productivity and the quality of the projects are so badly affected. The business faces more losses. Therefore in order to reduce those risks and to improve the quality and the productivity of the projects an in depth investigation on the risk management is conducted in this study.

1.2 OBJECTIVES:

- To focus on the different types of risks associated with development of a software project
- To find out the best way to minimize those risks
- To analyze the impact of the risk factors on the project

1.3 SCOPE:

- This article provides details about the various risk causing factors & it's co factors.
- This article helps the manager to minimize the risk to certain extend.
- With the help of this study the organization will get awareness about their faults & will rectify their faults. So that the organization progress in all aspects.

1.4 LIMITATIONS:

- The article has been done in the middle level company. So that the findings may not be applicable to low level & top level of companies.
- Through this article the risk management of middle level company has been studied & suggestions are provided. So this may not be applicable to other similar concerns.
- The sample size is limited to 150.

2. REVIEW OF LITERATURE:

Klein (1999) find different types of risks will affect budget, user satisfactions, and system performance. Other studies indicate that 15 to 35% of all software projects are cancelled outright, and the remaining projects suffer from schedule slippage, cost overruns, or failure to meet their project goals.

Boehm and DeMarco (1997) mentioned that "our culture has evolved such that owning up to risks is often confused with defeatism". In many organizations, the tendency to 'shoot the messenger' often discourages people from bringing imminent problems to the attention of management. This attitude is the result of a misunderstanding of risk management.

Boehm (1991) identified 10 software risk items to be addressed by software development projects:

- Personnel shortfalls
- Unrealistic schedules and budgets
- Developing the wrong functions and properties
- Developing the wrong user interface
- Gold plating (adding more functionality/features than is necessary)
- Continuing stream of requirements changes
- Shortfalls in externally furnished components
- Shortfalls in externally performed tasks
- Real-time performance shortfalls
- Straining computer-science capabilities.

Jones (1998) further presented three key software risk factors and concerns of both executives and software managers.

- Risks associated with inaccurate estimating and schedule planning
- Risks associated with incorrect and optimistic status reporting
- Risks associated with external pressures, which damage software projects.

Boehm (1991) and Johnson et al.(2001). More extensive lists can be found in Addison and **Vallabh (2002), Barki et al. (1993), and Schmidt et al. (2001).** These lists are usually compiled from surveys of the experiences of stakeholders such as project managers who have been involved in software projects.

Boehm, 1988; de Camprieu et al., 2007; Keil et al., 2002; Mursu et al., 2003; Schmidt et al., 2001. This raises the prospect that risk assessment based on published checklists may be biased and/or limited in scope.

Generic options for responding to project risks by **DeMarco and Lister, 2003; Frame, 2003; Kerzner, 2003; Schwalbe, 2007**. Within these high-level options, specific responses can be formulated according to the circumstances of the project, the threat, the cost of the response and the resources required for the response.

MIS Quarterly released a special issue dedicated to the topic of offshore outsourcing in June **2008**. The field of risk management has been investigated by scientists from **1988 to 2000 (cf. Dibbern et al. 2004, pp. 34-38, and 54).**

3. RESEARCH METHODOLOGY:

Research is common parlance refers to a "search for knowledge". Once can also define research as a scientific and systematic search for pertinent information on a specific topic. In fact

Research is an "art of scientific investigation".Redmon and Mory define research as a "**systematic effort to gain knowledge".**

Research Design:
o   The type of research design used in this study is descriptive type of study.

Sample Size:
o   The sample size of the study is 150 employees in middle level companies.

Measurements & Scaling techniques:
o   The measurement scale that has been employed for this study is **Interval scale.**
o   The scaling technique that has been employed for the study is the Itemized Rating scale**.**

Data Collection Method:
o   In this study primary data have been used to collect the data for analysis and it has been collected through questionnaire method.

3.1 STATISTICAL TOOLS:

Percentage analysis
o   Percentage analysis is the total number of respondents divided by the total sample size and multiplied by 100.

Cross tabulation:
o   Statistical analysis provides techniques for studying the relationships among and between nominal variables. This is named as cross tabulation or cross tabs, cross classification and contingency table analysis.

4. PERCENTAGE ANALYSIS:

Table 2- Nature of Software Project the Respondent Works

Nature Of Software Project	Frequency	Percentage
Programming Software	31	20.7%
System Software	27	18%
Application Software	30	20%
Inventory Management Software	20	13.3%
Utility Software	21	14%
Data Backup & Recovery Software	21	14%
Total	150	100

Source: Secondary Data
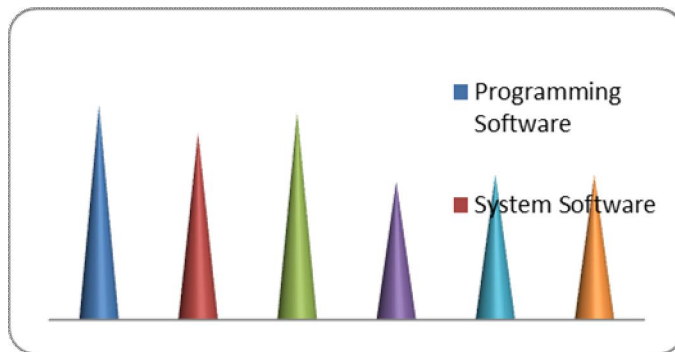
Chart 1-Nature of Software Project the Respondent Works

Inference:

From the above table & chart it's inferred that 20.7% of the employees are employed in developing programming software, 18% of the employees are in system software development, 20% of the employees are in application software development, 13.3% of the employees are employed with developing inventory management software, for utility software development 14% of the employees are appointed & remaining 14% employees are in data backup & recovery software development.

Table 3-Adaption of Risk Analysis in Business Planning Level

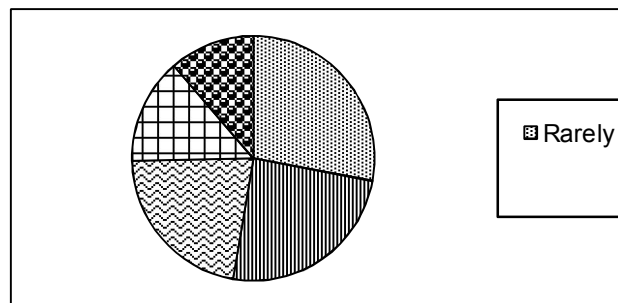| Risk Analysis On Business Planning Level	Frequency	Percentage
Rarely	42	28%
Occasionally	37	24.7%
Sometimes	33	22%
Frequently	21	14%
Very Frequently	17	11.3%
Total	150	100

Source: Secondary Data

Chart 2-Adaption of Risk Analysis in Business Planning Level

Table 4-Adaption of Risk analysis on Engineering Level

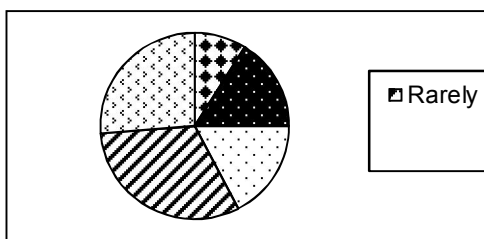| Risk Analysis on Engineering Level	Frequency	Percentage
Rarely	14	9.3%
Occasionally	25	16.7%
Sometimes	27	18%
Frequently	49	32.7%
Very Frequently	41	27.3%
Total	150	100

Source: Secondary Data

Chart 3-Adaption of Risk Analysis on Engineering Level

Inference:

From the above table & chart we can understand that at engineering level of software development process, the risk analysis is done frequently. Majority of the respondents say 32.7% accepts this statement.

Table 5-Adaption of Risk Management in Implementation Phase

Risk Analysis In Implementation Phase	Frequency	Percentage
Rarely	39	26%
Occasionally	36	24%
Sometimes	29	19.3%
Frequently	27	18%
Very Frequently	19	12.7%
Total	150	100

Source: Secondary Data

Chart 5-Adaption of Risk Management in Implementation Phase
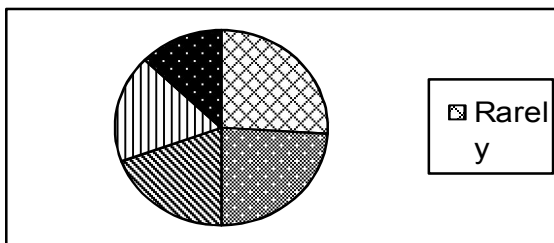
Inference:

From the above table & chart, the inference that we have drawn is that the risk analysis in implementation phase is done rarely. 26% of the employees are accepting this statement.

TABLE 7-Minimization of Risk in Developing the Software

Minimization of Risk	Frequency	Percentage
Yes Partially	96	64%
Yes Fully	**7**	4.7%
No	47	31.3%
Total	150	100

Source: Secondary Data
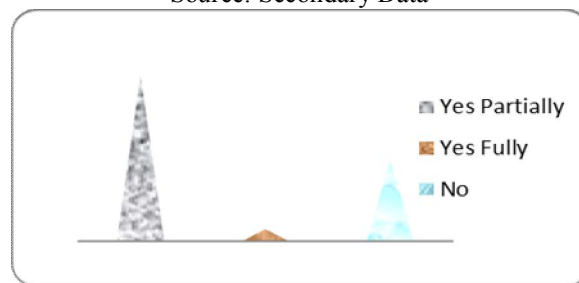
Chart 6-Minimization of Risk in Developing the Software

Inference:

From the above table & chart the inference for the minimization of risk is that majority of the respondents say that the risk can be minimized to a certain extend. 64% of the respondents are accepting this statement.

5. CROSS TABULATION

Nature Of Software Project	Level Of Risk		
	High	Medium	Low
Programming Software	11	14*	6
System Software	11*	9	7
Application Software	12	14*	4
Inventory Software	5	6	9*
Utility Software	4	11*	6
Data Backup & Recovery Software	7	9*	5

Source: Secondary Data * Level of Risk Faced
*Highest Value

Inference:

From the above cross tabulation table, we can conclude that the development of System Software alone faces the highest risks whereas development of the Programming Software, Application Software, Utility Software and Data Backup & Recovery Software faces medium level of risk. Inventory software development project faces low level of risk.

TABLE 9-Nature of Software Project

Risk Factor	Nature Of Software Project	High	Medium	Low	NA
Software Requirement Risk	Programming Software	10*	7	8	6
	System Software	3	8	6	10*
	Application Software	7	6	9*	8
	Inventory Management Software	3	5	6*	6*
	Utility Software	6	3	7*	5
	Data Backup & Recovery Software	5	3	9*	4
Software Cost Risk	Programming Software	7	7	4	13*
Software Cost Risk Software Scheduling Risk	System Software	5	8	9*	5
	Application Software	7	7	9*	7
	Inventory Management Software	8*	5	5	2
	Utility Software	5	3	9*	4
	Data Backup & Recovery Software	7*	7*	3	4
	Programming Software	8	9*	7	7
Software Scheduling Risk Software Quality Risk	System Software	1*	6	5	5
	Application Software	9*	6	8	7
	Inventory Management Software	5	4	8*	3
	Utility Software	4	7*	4	6
	Data Backup & Recovery Software	8	6	5	2
	Programming Software	7	6	8	10*
Software Quality Risk Software Business Risk	System Software	5	7	4	11*
	Application Software	8	5	11*	6
	Inventory Management Software	3	5	10*	2
	Utility Software	8*	5	5	3
	Data Backup & Recovery Software	1	6	5	9*
	Programming Software	12*	7	4	8
Software Business Risk	System Software	7	7	9*	4
	Application Software	9	7	11*	3
	Inventory Management Software	6	8*	2	4
	Utility Software	6	7*	4	4
	Data Backup & Recovery Software	8*	6	7	0

Inference:

From the above cross tabulation table the following inferences are drawn:

- Software Requirement Risk brings high risk in developing programming software.
- Development of Inventory Management Software & Data Backup and Recovery Software is highly affected by software cost risk.
- Software Scheduling Risk is the highest risk causing factor for developing System Software project & Application Software.
- Developing a Utility Software is mainly retarded by the failure of quality factors.
- Failure s in managing the business risk is the main reason for the retardation of both the Programming Software & the Data Backup and Recovery Software.

6. FINDINGS
6.1 PERCENTAGE ANALYSIS:

20.7% of the employees are employed in developing programming software, 18% of the employees are in system software development, 20% of the employees are in application software development, 13.3% of the employees are employed with developing inventory management software, for utility software development 14% of the employees are appointed & remaining 14% employees are in data backup & recovery software development.

43.3% of the respondents say that medium level of risk is associated with their software development.

72.7% or the respondents are interested in following certain standards in risk management process.

Majority of the employees are interested in following risk management program in the software development project.

Majority of the respondents say 28% are initiating the management to follow risk management program in the business planning level of the software development cycle.

Majority of the respondents say 32.7% needs risk management program to be conducted frequently in the engineering level of the software development cycle.

Majority of the respondents say 26% are expressing to conduct risk management program rarely in the implementation phase of the software development life cycle.

6.2 CROSS TABULATION:
A) From the cross tabulation analysis between Nature of Software & the level of risk the following results have been drawn.

i) The development of System Software alone faces the highest risks whereas development of the Programming Software, Application

Software, Utility Software and Data Backup & Recovery Software faces medium level of risk. Inventory software development project faces low level of risk.

B) From the cross tabulation analysis between nature or the software & the risk factors, the following inferences have been drawn.

i) Software Requirement Risk brings high risk in developing programming software.

ii) Development of Inventory Management Software & Data Backup and Recovery Software is highly affected by software cost risk.

iii) Software Scheduling Risk is the highest risk causing factor for developing System Software project & Application Software.

iv) Developing a Utility Software is mainly retarded by the failure of quality factors.

v) Failure s in managing the business risk is the main reason for the retardation of both the Programming Software & the Data Backup and Recovery Software.

7. CONCLUSION

This article describes risks in software development. Every software development has the risk because software development is based on knowledge and new technologies, and the chances for success of a software development project are closely connected with successful risk addressing. As a result of that, we have closely investigated risks and risk impact areas in software development projects. With this paper, we propose a key element of modern software development practices to be software risk management. In order to achieve efficient risk management, we have proposed three risk management strategies suitable for different software development projects according to the amount of risk impact. It also have proposed a risk-based approach to development planning and risk management as an attempt to address and retire the highest impact risks as early as possible in the development process. The risk-based approach to software development should enable early risk addressing and conclusion when the expenses connected with risk materialization and project failure are small and insignificant. Strategies proposed in this work should enhance risk management on software development projects and increase project chances for success. From the global business perspective, the success of many enterprises

is becoming increasingly dependent on the success or failure of the software they build. It is not important if software is intended to be sold, internally used or to drive business transactions, the future of many enterprises is connected with the software they develop. Thus, risk management is not only a crucial development practice, but also a vital business practice.

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"Determinants of behavioural attitude to accept E-shopping among the students in Malaysia''

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Abstract: This paper is concerned with an empirical investigation of the factors that could predict customer's attitude toward online shopping through applications of Innovation Diffusion Theory (IDT). The research model consists of four independent variables: relative advantage, compatibility complexity, trust and one dependent variable: attitude toward online shopping. After accurate data screening process such as outliers, normality, reliability and validity, 375 data is ready for structural equation modeling (SEM) analysis. Confirmatory Factor Analysis (CFA) was performed to examine the composite reliability, convergent validity and goodness of fit of individual construct and measurement models. This study found that there are three factors for explaining attitude towards online shopping, which are relative advantage, compatibility and trust; there is no significant in consumers' attitude towards online shopping based on complexity. In other words, students will evaluate online shopping based on such perceptions as whether the purchase through online will bring additional advantages, and, at the same time, be compatible with their current life style. Customers shop online to save time and effort.
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Key Words: Online shopping, trust, relative advantage, compatibility, complexity, attitudes.

1. Introduction

Over the past two decades Internet emerged as a selling and distribution channel that can be ignored by neither consumers nor the distributors and retail chains. There is great deal of research focused on various aspects of online consumer behaviour and consumer's attitudes towards buying various products online. Unfortunately, considerably less attention draw the researchers specifically to online shopping. However, amongst the developing countries like Malaysia, it is found that the adoption of e-shopping is still very low due to issues such as infrastructure, awareness and support (Kamarulzaman, 2011).

Being short of trust is one of the most regularly cited reasons for consumers not shopping on the internet (Metehan & Yasemin, 2011). The topic of trust seems to be one of the reasons why Malaysians are not rested in online shopping as most Malaysian consumers don't trust online transactions (Hassan & Kasiran, 2008). Moreover students are potentially competent of utilizing internet services and are believed to be the most frequent and active internet users (Zendehdel, Paim, Bojei, & Osman, 2011). Thus, it is significant for retailers and consumers' behavior researcher to recognize Malaysian students' population attitude toward online shopping due to student's role in online marketing in Malaysia. Therefore, the study investigate the factors that influence adoption and usage of online shopping in

Malaysia in the light of the Rogers' diffusion of innovations theory DOI (Rogers, 2003).

Innovation is connected to online shopping because shopping online can be treated as an innovative behaviour (Zhou & Zhang, 2007). A number of studies indicated user perceptions of the innovation influencing their adoption decisions towards online shopping (Papies & Clement, 2008; Tan & Thoen 2000). The innovation diffusion theory provides a set of innovation attributes that may affect adoption decisions.

Theory of innovation diffusion, one of the most influential innovation adoption frameworks, identified certain key characteristics of innovation. A meta analysis of innovation characteristics and innovation adoption found relative advantage, complexity and compatibility to be more consistently related to adoption behavior compared to other characteristics of innovation proposed by Rogers' theory (Dutta, 2012). Accordingly, in this study we suggest that relative advantage, complexity and compatibility aspects of online content are likely to influence the attitude of online shopping.

Relative advantage is positively related to adoption as compared to other perceived adoption characteristics. It represents the degree to which an innovation is being perceived as better than the idea it supersedes (Rogers, 1995). The relative advantages appear to be significant to the diffusion of online shopping innovation. Complexity, defined by Rogers

(1995), is the degree in which an innovation is perceived as relatively difficult to understand and use. If the degree of difficulty is high, then adoption will be low. Most of the user agreed that no additional skills were required for executing internet shopping, as it was not complicated at all. For them, basic computer knowledge should be sufficient for shopping. However, for the first- time user, familiarity with browsing and searching on the internet is important. In general, the respondents agreed that the degree of difficulty in e-shopping is low. Compatibility, which is positively related to adoption, refers to the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters (Rogers, 1995). Many users faced no problems in adapting to the new way of shopping, either with regard to their culture or social life. It is very compatible with their beliefs, values and practice.

Roger's DOI (1983) has been adopted and widely studied in mobile setting. For instance, Wu and Wang (2005) point out that perceived relative advantage and compatibility influence favourable attitude towards M-commerce. Previous study by Borg and Persson (2010) supported the relevancy of all five perceived characteristics of innovation in Roger's DOI in forming favourable attitude towards mobile transaction in South Africa. Lau (2002), utilized the DOI's attributes to predict the adoption of online trading by broker's in Hong Kong. The study found that perceived usefulness, perceived ease of use or complexity, relative advantage, compatibility, were significantly related with the attitude of using the system.

Beside trust is an important factor in many social activities, involving uncertainty and dependency (Pavlou & Fygenson, 2006). Also, it is central to any economic activity, whether conducted in a retail outlet in the actual offline world or in excess of the internet, and is still more important in an online situation (Gefen, Karahanna, & Straub, 2003; Gefen & Straub, 2004). One main reason for the importance of trust in e-commerce activities is the fact that in a virtual setting the degree of uncertainty of economic transactions is higher than in traditional settings.

Trust in e-shopping is affected by the trustworthiness of the internet vendor and relevant external environmental factors impacting on e-shopping transactions(Cheung & Lee, 2000) .The consumer wants the vendor to be prepared and capable to act in the customer's interests, to be honest in transactions, and to be competent of consistently delivering a product or service as promised (McKnight & Chervany, 2001). Additionally, the existing view of consumer trust in the e-commerce literature contends that trust has a direct positive effect

on attitudes and behavior (Pavlou, 2003; Teo & Liu 2007).

RESEARCH FRAMEWORK

The point of this study is to test empirically the influence of trust, together with some of the attributes of the theory of diffusion of innovation (IDT) on online shopping. Internet will be used as the targeted technology in this study. With the exception of observability. Observability was excluded in this study mainly due to the nature of the targeted technology chosen Internet shopping. We feel individuals typically do shopping transactions privately. The acts are not observable and visible to others (Tan & Thoen 2000). Besides maintaining three of the DOI variables, one more variables were added. Trust. This is so because several past studies have found that the perceived trust have found significant relationship with diffusion of any innovation. In this study, we hypothesized that trust, relative advantage, compatibility, complexity; affect an individual's attitude toward online shopping. The research model for this study is shown in Figure 1.

There are four hypotheses in this study.

H1: There is a positive relationship between relative advantage and attitude toward online shopping.

H2: There is a positive relationship between compatibility and attitude toward online shopping

H3: There is a negative relationship between complexity and attitude toward online shopping.

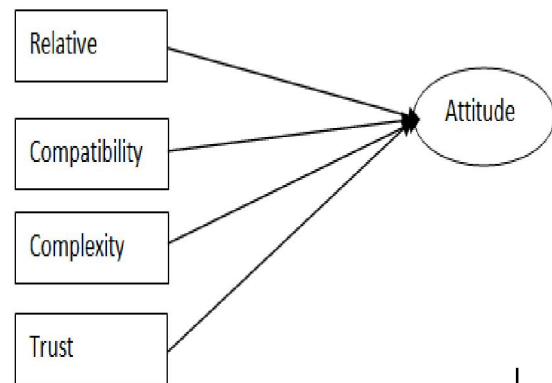H4: there is a positive relationship between trust and attitude toward online shopping.

Figure 1. (Ajzen, 1991)

Based on TRA, attitude is the first antecedent of individual intention to perform (Fishbein & Ajzen, 1975). Attitude toward behaviour reflects the estimation of positive or negative feeling to certain behaviour. Hence, this construct depends on whether it is positively or negatively estimated (Ajzen &

Fishbein, 1980). Moreover, attitude toward a behaviour is treated to be a function of one's salient beliefs that represent the perceived consequences of the behaviour and a person's favorable attitude toward a specific behaviour strengthens his/her desire to do the behaviour (Ajzen, 1991).

Materials and Methods

The research model includes four constructs and each construct was measured with items. All items were measured with a seven-Likert scale. Items of trust were adapted from McKnight and Kacmar (2002). Attribute of innovation were adapted from Parthasarathy and Bhattacherjee (1998) and Moore and Benbasat (1991) Survey approach was chosen to gather information directly from students in universities located in the Klang valley. students are potentially able of utilizing internet services and are believed to be the most frequent and active internet users (Delafrooz, Paim, & Khatibi, 2010). Thus, it is significant for retailers and consumers' behavior researcher to recognize Malaysian students' population attitude toward online shopping due to student's role in online marketing in Malaysia (Sabri et al., 2008). Thus selecting students as our sample was appropriate. Cluster sampling method was used. Among 400 questionnaires that were dispersed, about 380 were returned, but only 375 completely answered. Frequency distribution profile of respondents showed that 60 percent of the respondents were female while 40 percent were male. The majority of the respondents (55.2 %) fall in the

age range between 20 to 25 years of age. Respondents having a monthly income ranging from less than RM 2400 were the majority income group (72.3 %). From the ethnic point of view, Malays comprised 52.4%, followed by Chinese and Indians that composed 32.8% and 14. 4% of the study sample respectively.

3. RESULTS

Structural equation modeling (SEM) was adopted for the purpose of analyzing data in this study using Amos software. SEM estimates a series of separate, but interdependent, multiple regression equations simultaneously by specifying the structural model (Hair , Black , Babin, Anderson , & Tatham 2006). Hypotheses are simultaneously assessed in the context of the entire model rather than through independent regression analyses of each distinctive hypothesis. A variety of fit diagnostic statistics are generated by the Amos software to assess how well the model actually defines the data. The coefficient alphas for each construct were above the acceptable threshold of 0.70 set by Nunnally (1978). The measurement model fit the data well.

Confirmatory factor analysis was conducted on each individual construct and measurement models (see Table 1). All CFAs of constructs produced a relatively good fit indicated by the goodness of fit indices such as CMIN/df ratio (<2); p-value (>0.05) Goodness of Fit Index (GFI) of >.95; and root mean square error of approximation (RMSEA) values of less than .08 (<.08) (Bagozzi & Yi, 1988; Hair et al., 2006).

Table 1: Overall Fits of the Research Model

Fit index	Recommended Value	Source of Recommended Value	Observed Value
Chi-square/ degrees of freedom	≤0.3	Hair, Anderson, Tatham and Black (1998)	1.67
Comparative Fit Index (CFI)	≥ 0.90	Kelloway (1998)	0.90
Goodness-of-fit Index (GFI)	≥ 0.90	Kelloway (1998)	0.095
Root Mean Squared Error of Approximation (RMSEA)	≤ 0.08	Browne and Cudek(1993)	0.054

Table 2 .Summarizes the Results of Hypotheses Testing of this Study

Hypothesis	IV	DV	Coefficient	(P-value)	Remark
H1	Relative advantage	Attiude	.221	.017	Supported
H2	Compatibility	Attitude	.111	.045	Supported
H3	Complexity	Attitude	-.020	.706	Not supported
H4	Trust	Attitude	.172	.035	Supported

4. Discussion

This study is concerned with empirical investigation predictors of attitude toward online shopping that could affect successful predictors of attitude toward using of Internet in Malaysia through Applications of Innovation Diffusion

Theory IDT. As hypothesized (H1), Relative advantage was found to have a significant positive effect on attitude toward online shopping (ß=.221; CR=2.10; p=.017. The Second hypothesis suggests a positive relationship between compatibility and attitude (ß=.111; CR=2.041; p=.045). The finding shows that compatibility is another success factor that has significant effect on attitude toward online

Shopping. The findings of previous studies indicate that these variables (relative advantage, compatibility) are significant factors in predicting the adoption of innovations (Rogers, 1995). In other words, students will evaluate online shopping based on such perceptions as whether the purchase through online will bring additional advantages, and, at the same time, be compatible with their current life style. Customers shop online to save time and effort.

The results show that complexity it's not significant contribution to the prediction of attitude towards online shopping ($\beta = -.020$, C.R= -1.684, P >.05). Therefore, H3 was not supported by the data in this study. Eastlick (1993) and Lin (1998) found no significant relationship between complexity and adoption. As long as an individual's technology apprehension is outweighed by the perceived advantage of innovations, complexity is not a serious concern for consumers (Lin, 1998). Moreover Perceived trust was found to have significant effect on attitude (ß=.172; CR=2.069; p=.035). This finding confirms that the online shopping customers in Malaysia were trusting in Internet shopping but the marketer needs to develop strategies that could improve the customers trust in the underlying technology. The result is consistent with previous findings that a positive relationship exists between attitude and trust (Jarvenpaa, Tractinsky, & Saarinen, 1999; Teo & Liu 2007).

Implication

This paper declare unless an innovation can provide better content, superior technical benefits, and cost efficiency to consumers, an innovation can hardly displace the traditional technologies. In this paper the predicted factors are all relevant and can help marketers and advertisers to develop more capable ways to attract consumers to shop on the Internet. Further online store should organize website contents compatible with the way people manage their needs, in the traditional way, including language and consistency in terms of the users past experiences and beliefs. Above all this experience should be seen as more useful compared with the traditional ways. Findings expand the research on trust in online retail by representing that the relationship between trust in online shopping and attitude is significant, even when other factors are taken into consideration.

Researchers must therefore take these other factors into consideration and not look at trust in isolation in online shopping adoption studies. This research also contributes to the literature on innovation adoption by confirming the importance of potential adopters' perceptions of the characteristics of an innovation is significantly related to attitude of that innovation. In addition, this research makes contributions to practice. Designers of online consumer marketer sites can use the results to help evaluate potential changes in the site design.Understanding the importance of trust in online shopping, relative advantage, complexity and compatibility helps marketer build sites and practices that are more likely to lead to the use of online shopping by consumers.

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Detection of reflection in iris images using back propagation

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Abstract – In our work with the help of back propagation and RST algorithm reflection in iris images are located and removed. From the database the biometric templates from iris images are extracted which are later used for comparison, this phase is called Iris encoding. A pattern recognition system with 2 folds is present in order to recognize the image pattern; extract the set of features from iris using RST [Radial symmetry Transform] algorithm; an inductive classifier to achieve reflection, detection and location by a pixel by pixel analysis. The use of the FFNN method instead of the RSBIN or BIN method can achieve a more robust behaviour of the system with respect to the threshold value. The whole system has been implemented in Mat lab by exploiting the available Neural Network Toolbox and PROTOCOL. The project description consists of five modules. An iris image is extracted, reflection is detected and then the feature extraction, selection and fusion is carried over with classification system and error is estimated. The RST used focus on neural network as classifiers and this RST is best suited for detection and localization of reflection.

1. INTRODUCTION

Biometric systems exploit automated methods capable of recognizing the individuals by analyzing their physiological and or behavioral characteristics. Physiological biometrics is based on data derived from the direct measurement of the body parts (e.g., fingerprints, face, retina, and iris), whereas behavioral biometrics is based on measurements and data extracted from human actions (e.g., gait and signature). Iris biometric systems identify the user by performing the following steps: The first step is acquisition of the iris image (sample) by the sensor module. The second step is the localization of iris in the acquired image. All biometric systems can achieve their maximum accuracy in the identification or verification only if the samples are correctly acquired. For this reason, all the exogenous elements that are superimposed to the real biometric information in the sample must be removed (e.g. reflections, eyelids, eye brushes etc.). This operation can reduce the probability of erroneous matching. In the case of iris sample, the exogenous elements are mainly, Eyelids, Lashes and, Reflections.

In this step, the edges of the pupils and iris must initially be located in the input image, and then the eyelids, lashes, and reflections must be identified and removed from the iris image. The third step aims at extracting biometric template from the iris (iris encoding) [8]. This template will be used by the biometric system to perform comparisons (matching) with the templates are used as reference, generally stored in a database or in an identification document typically using a smartcard-based technology. Most of the systems require about 100×100 pixels of resolution for the iris to suitably identify every individual. Nowadays, sensors, such as web cams, have also been considered to perform iris identification Reflections in the iris images can occur in a great variety of applications and acquisition systems. This phenomenon is due to the particular shape and condition of cornea (the spherical and wet transparent surface that protects the iris and the inner eye from the outside). The light coming from windows, screens, and illumination system is often reflected by cornea. Additional reflections may be caused by occlusions such as contact lenses and eye glasses.

Unfortunately, reflections tend to be superimposed on iris pattern, causing difficulties in the iris acquisition. Complex iris based biometric systems use special illumination system (e.g., single point IR illuminators, optical filters,) and requires that users must be correctly positioned in front of the sensor. Consequently, reflections are confined in the pupil area, outside of the iris pattern. However, even in such cases, external reflections are often very frequently present in low-cost systems and in outdoor conditions. A pattern recognition system capable to locate the reflections that are present in the iris image is focused here. In particular, the contribution is in twofold;

i) A highly effective set of features to be extracted from iris images [based on the radial symmetry transform (RST)] and;

ii) An innovative adaptive design methodology for creating an inductive classifier to achieve reflection detection and location by a pixel-by-pixel approach.

The proposed method can work with any close-up image of the eye, and it does not require any information concerning the iris position and other segmentation information. This allows for an implementation of flexible iris-based identification systems that are very robust to environmental and operating conditions.

2. OBJECTIVES

An adaptive design methodology for reflection detection and location in iris biometric images based on inductive classifiers, such as neural networks is presented. In particular, a set of features that can be extracted and measured from the iris image from an every individual can be effectively be used to achieve an accurate identification of the reflection position using a trained classifier and removal of reflections using the neural networks is achieved at an effective rate. The two types of neural network concepts such as inductive classifier and feed forward back propagation are used to evaluate the accuracy rate of those neural network concepts. Thus the final comparison yields the better accuracy rate than the proposed concept.

3. SYSTEM ANALYSIS

The approaches presented in the literature traditionally consider the reflections as any other occlusion in the biometric images. The methods in existing system implicitly estimate the presence of occlusions since their presence tend to degrade the overall sample quality. Reflection removal in iris is typically achieved by localizing reflections by means of segmentation technique based on hard threshold. Threshold is performed by using one or more features extracted from the iris pattern. The existing system consists of certain drawbacks like high computational complexity regarding threshold value; feature extraction varies between samples and no defined methodology for extraction of features and low accuracy. Our designed proposed system doesn't require any information concerning iris position and other segmentation information if the sample is a close up eye image. So the system is tending to be flexible. The system uses RST for detection and location of reflection using two parameters:

1. N- array of candidate radii

*N is symmetry: N = low value- image will be of low contrast; N = high value- image will be of high contrast;

2. α - strictness parameter

* α = low value- bilateral symmetry

   α = high value- strict radial symmetry

In the transformed image, only symmetrical objects whose radii are comparable with those in the N array will be enhanced (high contrast). Objects with low radial symmetry tend to be suppressed in the transformed image (low contrast). With small values of the parameter α (i.e., ≤ 1), image features also having bilateral symmetry will be enhanced. With higher values of α, only objects or features in the image with strict radial symmetry will be enhanced.

3.1. RST Algorithm:

- In this algorithm local radial symmetry I(p) is mapped to transformed image s(p), denoted by P (x,y).

- The data set from the sample which are in pixel form are captured and these pixels are classified as pixels with reflection and pixels with no reflection.
- Here the data set consist of 153,876 classified pixels, among these the iris pixel is 6.92% and reflection pixel is 2.34%.
- So any change in reflection will lead to corresponding change in iris pixel there by arising difficulties in pattern recognition. Thus the reflections should be removed.
- Once the RST has been performed, reflections are detected and localized by selecting the pixels in the map that have an RST value of higher than a predefined threshold.
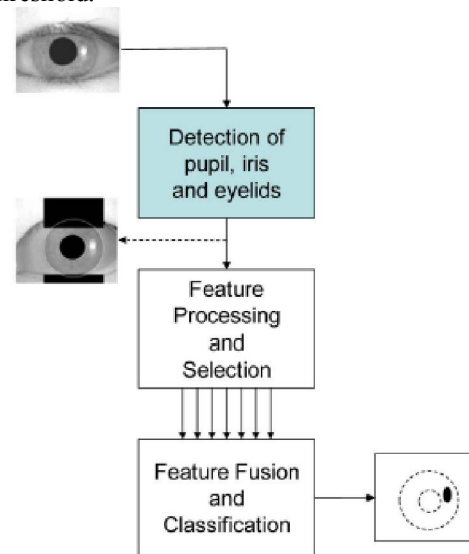

FIGURE: 1 Structure of the Proposed System for Reflection Identification

4. SYSTEM DESCRIPTION:

The reflections in different images are shown in fig .2. Due to the spherical shape of the cornea, the reflection tends to be smaller than pupil. This kind of shape has relative high value in RST. This consist of two parameters "an array of candidate radii (N) and radial strictness parameter α. In the transformed image, only symmetrical objects whose radii are comparable with those in the N array will be enhanced (high contrast). Objects with low radial symmetry are tending to be suppressed. With small values of the parameter α (i.e., ≤ 1), image features also having bilateral symmetry will be enhanced. With higher values of α, only objects or features in the image with strict radial symmetry will be enhanced.

4.1. Module Description:

The modules involved in the development of project are; Image acquisition and Pre-processing; Feature Extraction and Fusion; Inductive Classifier and Error Rate; Feed Forward Back Propagation and Accuracy Rate; Performance Comparison (Inductive Classifier and Feed Forward Back Propagation).
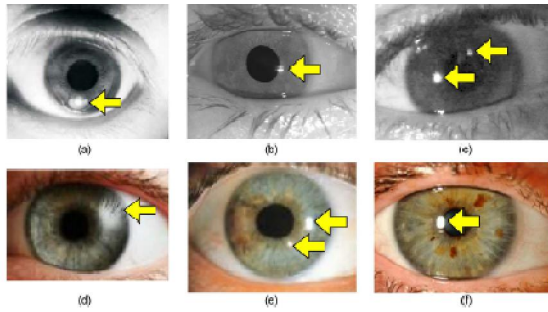
FIG.2: Reflections in Different Images

a. Image Acquisition and Pre-Processing:

This module locate eye image (center of iris) then detect and locate the reflection. This is done by two types of analysis:

1. Global image analysis
2. pixel by pixel analysis

GLOBAL IMAGE ANALYSIS: The single vector of features is extracted from the whole image. This will return a binary answer i.e., reflection present/ reflection not present. In case of absence of reflection the sample images are discarded.

PIXEL by PIXEL ANALYSIS: In this each pixel is analyzed and it returns a transformed image p (x, y) which masks itself. Hence the iris pattern is measured using total amount of pixels classified by classification system. If the measured value is low it will be taken as threshold value and pre-processing is done.

b. Feature Extraction and Fusion:

In this module the relevant and significant features are extracted from input image and if there are no reflections then request for new images are sent and the existing images are discarded. This module consists of two types of classification as:

1. Single pixel classification system -each pixel is analyzed; output will be in binary form (0-no reflection,1 reflection)
2. Multiple classification system considers whole image for analysis and classification so accuracy will be more.

Fusion is described as mapping of input space into potentially reduced subset features. These subset features are used for improving the accuracy of the final classifier. The subset features are obtained using Principle component Analysis (PCA). This PCA transforms variations in input image into minor number of components in order to increase the accuracy.

c. Inductive Classifier and Error Rate:

It will classify each single pixel of image and produce single binary answer concerning the presence of reflection in overall input image. The quality of the eye image depends on feature extracted from iris. The presence of occlusion (blockings) degrades the quality of sample. The neural network concept used in this classification system faces two issues.

1. Disjunct problem: in this number of rules produced by rule induction algorithm is often high;
2. The next problem is that the boundaries of each rule can be optimized in some degree for improved accuracy.

In order to improve the accuracy and to represent as simpler network we use gradient descent optimization of network. The error function is the mean square of error and denoted by Sr, the below Fig: 2 depicts the accuracy obtained in this module. The classification system uses a final acceptance threshold obtained from pixel by pixel analysis. The Final Acceptance Rate (FAR) and Final Rejection Rate (FRR) depend on this threshold value. In this case, the behavior of the overall system is better described by the Receiver Operating Characteristic (ROC), which concisely represents the different FARs and FRRs of the system with respect to the possible threshold values. An ideal system achieves FAR and FRR equal to 0 for all threshold value.
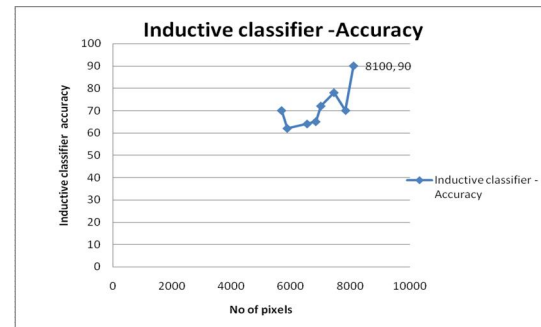

FIG: 3: Inductive Classifier – Accuracy

d. Feed Forward Back Propagation:

This will start with input layer connected to hidden layer and in turn connected to output layer. In any network one hidden and output layer is must and at the same time any number of hidden layers can be.

Input Layer:

It represents the condition for which the neural network is trained. Every input neuron represents the floating point number and in case of non-numeric data we use normalization concept to convert into numeric representation.

Output Layer:

This layer can be directly traced back to input layer. The number of neurons represents the type of work neural network performs. The characters are represented as pixels which in turn represent the number of neurons characters. The characters are represented as 5*7 grids which contain 35 pixels. The number of output neuron depends on how many characters the program has been trained to recognize the patterns. (Maximum 26 characters are trained)

4.2. Back Propagation:

This is used to train multi layered neural network and it represents the network with trained data. In this the error is calculated by difference between actual and expected output. The fig: 4 represent the relation between numbers of pixels and feed forward propagation and existing accuracy.
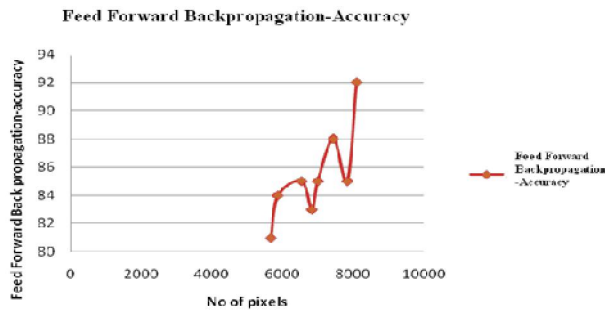
FIG: 4: Feed Forward Back Propagation- Accuracy

Network is presented with samples from trained set and the error is reduced by modifying the weight and threshold. Gradient descent method is used to find the weights that will minimize the error function. This error function is known as back propagation because it propagates the error backward through the network.

4.3 Accuracy Rate:

Existence of reflection is checked from database and carefully identified. Then comparison is made between bits of template and masking bits.
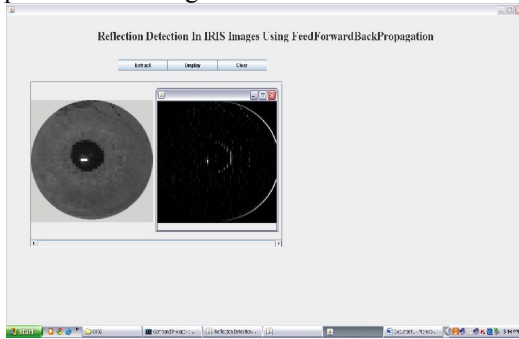
FIG: 5. The Process of Detecting the Edge and Noise Occurred in the IRIS Image.

4.4. Performance Comparison:

S.NO	NO OF PIXELS	INDUCTIVE CLASSIFIER - PIXEL REFLECTION RATE
1	7220	850
2	7440	900
3	7470	910
4	7530	920
5	7635	940
6	7700	950

Table: 1 Inductive Classifier - Pixel Reflection Rate

In this module the data set are divided into two parts. First tune the system parameters and train inductive classifier. Then validation for data set is done. Here tuning depends on technology adapted for feature extraction. Each technique has specific method to set the parameters. The Table: 1 and Fig: 5 depict that when pixel number increases the reflection rate increases.
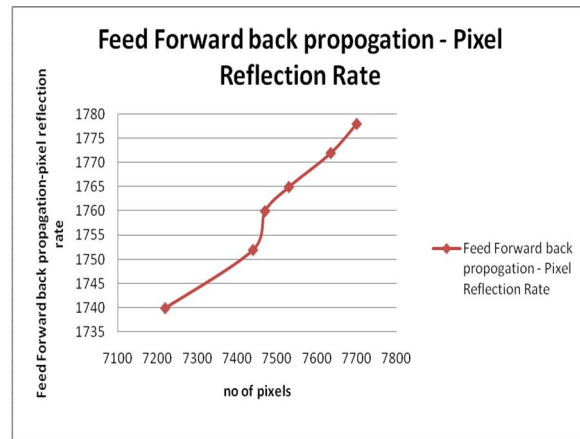

FIG: 5 - Comparison Grap

5. SYSTEM IMPLEMENTATION:

From the acquired image detection and location of reflection is done using RST algorithm. The threshold value (t) is computed as t= α max (RSBIN (p)); α=0.6. ROC is done for RSBIN and BIN; Existing system uses BIN approach and PROPOSED system uses RSBIN approach. In BIN approach left portion of the ROC curve has better behavior at this condition FAR rate is high. This BIN is of no use when minimum total classification error is achieved i.e., when t = 1. So we go with RSBIN. In RSBIN the right side portion of the ROC curve performs well and minimum classification error is achieved when α = 1. The pixels belonging to the reflection has been compensated by processing the mean intensity value of 10- pixel. The data flow diagram (Fig: 6) represents the overall system flow.

5.1. Input Design:

Reflection classification is obtained by using the two inputs; 1. Grey level intensity of pixel 2. Corresponding value of RST.

The input configuration is tested by Feed forward neural network with number of hidden neurons i.e., 1-30. To achieve minimum total error 4 neurons should be present in hidden layer.

5.2. Output Design:

In this K Nearest Neighbor (KNN) classifier is used with K range from 1-15. If K=1 then it shows best result so no threshold and ROC curve is seen but in this case also FAR (1.62%) and FRR (1.66%) exist. So totally 3.28% of total error rate is observed. Thus the computational complexity of KNN model can be estimated with respect to the execution time of two classifiers.

5.3. Output Design:

In this K Nearest Neighbor (KNN) classifier is used with K range from 1-15. If K=1 then it shows best result so no threshold and ROC curve is seen but in this case also FAR (1.62%) and FRR (1.66%) exist. So totally 3.28% of total error rate is observed. Thus the computational complexity of KNN model can be estimated with respect to the execution time of two classifiers.
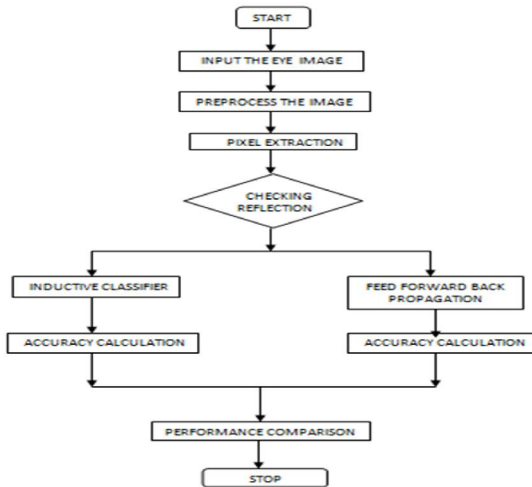
FIG: 6 Data Flow Diagram

6. CONCLUSION:

An adaptive design methodology for reflection detection and localization systems in iris biometric images is presented. The proposed methodology addresses the main steps of system design feature extraction, feature selection, feature fusion, creation of the suited classification system, and its error estimation. The methodology presented here is based on an innovative approach for the detection and localization of reflections. A suited set of features is extracted from the iris pattern, and an inductive classifier is then used to perform the reflection segmentation. In particular, the use of the RST as a new significant feature is introduced, and focused on neural networks as classifiers. Results show that the RST can be considered as a very good feature to detect and localize reflections. This feature can easily be used, with a thresholding approach, to quickly perform detection and localization of the reflections, although not very accurately.

6.1 Future Enhancements:

A more discriminative and significant set of features can be adopted by considering the RSTs and other classical features. This set of features has successfully been used to achieve much higher accuracy by means of neural networks. The proposed methodology allows for creating reflection detection and localization systems that have been proved to be much more accurate than those obtained using traditional threshold methods. The low computational complexity of the proposed systems is very suitable for real-time applications. The future implementation involves the usage of two or more neural network concepts instead of inductive classifiers and feed forward back propagation which could provide an improved efficiency.

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Conflict Administration in Multicultural Organization: An Informative Life Approach

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Abstract: Conflict management is a type of administration which could be administered the association with the most excellent customs and generates equilibrium flanked by organization and employees and eradicate the conflict. Usually, conflict administration is the progression of conflict responsibilities gratitude between intergroup and intergroup and use of conflict methods for eradicates or replicates conflict for organizational usefulness. This investigate is intended to commence conflict supervision and how to use its approaches to adjust this occurrence. This research illustrates that managerial conflict has both informative and disparaging outcome. Managers should use disagreement administration in each association. The majority conflict management approach used to control conflict is collaboration between managers and staffs. Conflict management has important role to make managers triumphant. Even though, a least amount of conflict is suitable in every association but no directors agree with lawlessness in his association.

Keywords: Conflict; Business; Association; Challenging; disagreements.

1.   INTRODUCTION

Conflict Management is one of the most important parts of a business. It is for the reason that, at any time a conflict happens in an production, it has an abrupt impact over the efficiency of the production. A conflict may be distinct as the state in which the apprehensions of community within an association come into sight to be mismatched. It is consequently understandable that the output of an industry humiliates when the divergences within the business is elevated. An industry or an association could create better results if the powers that be in the higher stage would be capable to handle the conflicts occurring within the organization in an efficient way. Most organizational disagreements engage disagreement over the task-related factors in which people inside the organization may produce diversified perspective over a exact task. When such conflicts are knob beneficially, that is when the qualities of each perspective is match up to and their viability is scrutinized, they provide pioneering conclusions which would get better the system and the creation or task would outcome with a better comment.

2. LITERATURE REVIEW

From the literature review completed it become apparent that the characteristic investigate on conflict-management hardly ever reproduce on community segment association such as metropolis. Research done by preceding writer strenuous on dissimilar features of conflict that are appropriate to larger confidential sector commerce association or groups from tertiary learning establishment, monetary institutions and others (Havenga, 2006:5). Unnecessary or insufficient levels of disagreement hold back the efficiency of group part which may lead to fewer fulfillments, greater than before nonappearance and earnings rates, and finally lower efficiency. When conflict is at a most favorable level, fulfillment and unresponsiveness should be reduce, motivation should be enhanced through the arrangement of a demanding and puzzled surroundings with a liveliness that create work attractive. Pelled, Eisenhardt and Xin (1999:4) and Jehn (1995:265) stress the point that two famous rudiments of conflict dynamics are the ways in which an association manages productive (functional) and unhelpful (dysfunctional) disagreement. Recognition of these basics can add to the ultimate achievement of an association eliminate unenthusiastic divergence basics in its planned preparation and more particularly its individual possessions administration (Havenga, 2005:123). On the other hand conflict administration approach involves gratitude of types of disagreement

which may have unenthusiastic influence and those that may have optimistic belongings on individual and group presentation. This can be attain by reduce emotional disagreement at a variety of levels; attain and preserve a reasonable quantity of substantive divergence; choose and use suitable conflict management approach (Rahim, 2002:215). One is supposed to be conscious of disagreement at a variety of height of an association and particularly of conflict administration method practical to interpersonal disagreement (Rahim, 1986:30). Investigative the quantity of divergence in family member to the style goes after in conducting conflict is the maximization of managerial usefulness (Weider-Hatfield, 1995:690). It has also be noted by Kim, Wang, Kondo and Kim (2007:25) that people use dissimilar conflict administration styles depending on the stage of influence of the gathering in the disagreement. Particularly superior are more probable to force their wellbeing and human resources are more likely to conciliation with their peers, whereas subsidiary favor to yield their welfare. Well-known studies on divergence treatment styles clearly differentiate between divergence resolutions on the one hand and treatment or organization conflict on the other hand (Rahim, 1992; 2002; Thomas and Killman, 1974; 1976). Rahim and Bonoma (1979:1323-1344) discriminate the conflict conducting styles on two basic magnitudes: concern for self and concern for others. This associates with the categorization of Thomas and Killman (1974; 1976). A amalgamation of the two magnitude result in five exact styles of supervision interpersonal divergence (Rahim, 1983:372).To whip about in the globalized humanity nervousness demand make familiar yourself them to the enduringly increasing external situation. The ability to take make use of to untrustworthy circumstances bring to a close the ability of certain to move violently in this period of vagueness. Multicultural teams are wrought to get better the potential of an association by manufacture capable use of the diversity of point of view. But this point in time also strains a sympathetic thankfulness of group members' various reassuring principles. On the complementary abolition of taming morals of team relate portrayal a group to a compilation of disadvantage. In the center of an amount of the drawback avowed over, the formation of a scathing fight is a chief impediment which tackles the ability of a multicultural collection.

3. THE INDICATION OF DISAGREEMENT

The Red flags of disagreements are body communication, divergence, apart from of substance, preservation awful in sequence, shock, brawny collective announcements, airing difference through

medium, conflicts in value schemes, and desire for ability, rising lack of support, open dissimilarity, lack of openness on budget dilemma or other susceptible matters, be short of noticeable aspire and no discussion of enlargement, ineffective goals, and inability to assess leaders reasonably, systematically, or at all. Conflict is unresponsive when it takes scrutinize away from other presentation and it reimbursement the spirit of the squad or an entity. It split people and collection, and create cooperation hard. It makes people or group focus on their dissimilarity and leads to damaging behavior, like hostility or name-calling. Other than it is able to be positive or productive when it clears up important dilemma or substances carry about description to plight and gets everybody anxious in resolving issue. It causes real announcement and liberate sensation, nervousness, and strain in a optimistic way. It assists people be taught more about each other and oblige and also assists people to expand the sympathetic and talents.

4. CONFLICT RESOLUTION

Lots of people take pleasure in functioning or contributing in a group or team, but when a group of communities work mutually chances are that divergences will happen. Hazleton portrays conflict as the inconsistency between what is the professed authenticity and what is seen as perfect (2007). "We go into into divergence unenthusiastically, vigilantly, furiously, apprehensively, self-assuredly- and come out from them decrepit, worn out, sad, fulfilled, and victorious. And still many of us undervalue or overlook the qualities of conflict- the chance conflict offers every occasion it happens". Conflict does not have to lead to a antagonistic atmosphere or to conked out associations. Conflict if determined successfully can guide to a optimistic practice for everyone concerned. First, there ought to be an consideration of the reasons why disagreement happen. The conflict must be move towards with an open mind. Using definite approaches can guide to a triumphant declaration for all gatherings occupied. The Thomas-Kilmann Conflict form tools states "there are five universal approaches to commerce with disagreement.

5. CULTURAL DIVERSITY AND DECISION-MAKING OF FIRMS

Given the enduring tendency in the direction of globalization, there is a mounting need for executives with cross-cultural considerate. Employees who have cross-border responsibilities and/or cross-cultural associations need to be equipped to successfully knob the predictable intercultural tasks and confronts concerned. The troubles stemming from cultural multiplicity are widening away from the Indian

difficulty. Corporations are now spending in variety management to expand spirited benefit. Diversity is no longer 'nice to have', but 'necessary to have' as it has notable suggestions for a business' attainment and high presentation. Even corporations that do not have culture administrators are expenditure more time and belongings in consideration multiplicity. Assortment management has seen a standard transfer since it came into engage in recreation in the US about less than a decade ago.

Table 1. Degree of Worker

Degree of Worker Involvement In Decision-making of Firms			
	Direct Involvement of workers	Involvement of Representative bodies	Board Representation standing	Overall Standing
Germany	3	1	1	A
Sweden	4	2	1	A
Norway	1	10	1	B
Netherlands	9	4	2	C
France	7	3	2	C
Belgium	5	6	3	D
Finland	2	9	3	D
Denmark	8	7	1	D
Israel	11	5	3	D
Italy	6	8	3	E

6. FIVE CONFLICT MANAGEMENT STYLES
6.1.1   Accommodating
This is when help to a high-degree, and it may be at own spending, and in fact work contiguous to own goals, objectives, and preferred results. This move toward is effectual when the other gathering is the authority or has a better explanation. It can also be effectual for conserve potential relatives with the other revelry.

6.2 Avoiding
It is a method of commerce with disagreement, which efforts to keep away from straight tackling the matter at hand. Techniques of doing this can comprises altering the topic, putting off a conversation awaiting afterward, or simply not carrying up the subject of argument. Conflict evading can be used as an impermanent calculates to buy time or as enduring means of disposing of a substance. The latter may be impossible to differentiate from uncomplicated compliance to the other party, to the level that the person keep away from the conflict secondary their own needs to the social gathering with which they have the disagreement.

6.3 Collaborating
This is where you connect or pair up with the other social gathering to achieve both of your objectives. This is how you shatter free of the "win-lose" instance and seek the "win-win." This can be capable for comprehensive state of relationships where you need to find a narrative explanation. This can also mean re-framing the confront to produce a better space and room for everybody's opinion. The disadvantage is that it necessitates a high-degree of trust and attainment an agreement can necessitate a lot of time and effort to get everybody on board and to manufacture all the judgments.

6.4 Competing
This is the "win-lose" move toward. You act in a very self-confident way to attain your objective, without looking for to lend a hand with the other social gathering, and it may be at the cost of the other party.   This come up to may be suitable for emergency when time is of the quintessence, or when you need quick, important action, and people are alert of and hold up to go in the direction.

6.5 Compromising
This is the "lose-lose" state of affairs where neither gathering really achieves what they want. This necessitates a reasonable level of brazenness and assistance. It may be suitable for situation where you need a temporary explanation, or where both sides have uniformly significant objective. The ensnare is to fall into concession as an easy way out, when work together would create a better explanation.

7. CONFLICT AND JOB STRESS
Lazarus and Folkman (1984) and Lazarus (1966) take on a cognitive point of view on worry and draw variation flanked by stressors (independence of the surrounds that are deliberation to cause stress, such as work force), the information of strain, and sprain (the physical or emotional consequences of stress, such as aches/pains, exhaustion, and worry). In this article, we refer to job stress as the grouping of the cognitive knowledge of stress in the work circumstance and the practice of work-related demands. Work and non-work disagreement is a form of inter-role conflict in which work- and family-role anxiety are mutually mismatched due to overpowering instantaneous demands (Burke & Greenglass, 1987; Edwards & Rothbard, 2000; Greenhaus & Beutell, 1985). Conflict flanked by employment and unemployment rolls, and the role surplus it cause, has been establish to be a most important cause of job strain (e.g., Frone, Russell, & Cooper, 1992; Judge et al., 1994). Job stress happens because conference the difficulty of one work or non-work role constructs it not easy to get together the difficulty of the additional. Fundamental work can optimize the use of possessions such as force, time, and concentration flanked by work and non-work domains. For instance, virtual employees

may decide to apply their cerebral energies on work in the daybreak somewhat than expend their power on an aggravating commute. However, it is also likely that virtual workers may experience substantial resource drain if they encompass to be particularly attentive about how they spend their time away from the place of work because they are troubled about the disgrace of being "out of sight, out of mind." Thus, because virtual work is not regularly related with segmentation and reserve drain, it is hard to look forward to whether practical work aggravate or attenuates work and non-work conflict (and, consequently, job stress).The work and non-work disagreement writing differentiate between work intrusive with non-work every day jobs and non-work intrusive with work responsibilities (Frone et al., 1992; O'Driscoll et al., 1992). We take on the dissimilarity made in previous research relating to work and non-work interfering, using the term work and non-work conflict to refer to both work intrusion in non-work and non-work intrusion in work in all suggestions. We explore the relationship of both magnitude of disagreement, with work and private characteristics on the one hand and the practice of job

8. Managing Conflict and Negotiating Effectively

Managing conflict is incredible that as persons familiarity on a every day foundation. Conflict may be in subdivision, teams, and higher establishments and even within themselves. The persons have difficulty with and do not comprehend is how to contract with conflict in an efficient way or to keep away from disagreement. They have forever whispered that not the whole thing are destined to snarl over from time to time to keep away from matters it is best to go with the flow as extended as it is not a life-threatening circumstances. Most of the time persons consider in a different way, act differently, and desire dissimilar belongings in life and in an group. When these dissimilarity come about it is significant to have a strapping organizer who can decide what is more imperative and whom thoughts will work best in the circumstances. Having an important person on the exterior seeming in can sometimes help persons come jointly and have the same opinion on incredible without the conflict matters.

9. Dealing with Conflict in Work Teams

Conflict will always survive when a group or squad is self-assured with dissimilar community with diverse move towards and ideas with dealing with circumstances. Learning to work mutually with industry with divergence can and will supply your group or team with a rapid decision. Conflict cannot be avoided and is predictable in leasing a team expand and supply a productive and perhaps valuable outcome in managing the conflict.

When we usually think of divergence it is a very unenthusiastic consideration about the squad constituent. More often than not there is disagreeing, screaming or incompatible which can make others feel painful. Erudition how to deal and grip this divergence beneficially will usually look up the efficiency and create new ideas and help develop behavior of extra in the team. Each team will go from side to side phases of growth and expansion.

10. INDIVIDUAL CHARACTERISTICS AND WORK -NONWORK CONFLICT

When fundamental human resources work away from a conventional office (typically in a home office), work and nonwork aspects of life are co-located. When work and nonwork province are co-located, environmental prompts may be contradictory or confusing (e.g., the television or dirty dishes in the sink are as salient as the computer and file cabinet). Furthermore, without obvious work-related cues, effective employees may be less able to focus on organization and implementation their work tasks. They may have complexity location recital goals, uphold a work schedule, and prioritizing employment, and yet these behaviors are critical for segmenting work and nonwork domain or organization resource drain.According to Bandura, when presented with ecological anxiety, persons judge their ability to productively cope with the confronts they face. Thus, individuals with bigger self-efficacy are more likely to provide effort in, and effectively diminish, the level of variance they know-how among work and nonwork. Likewise, individuals who use formatting performance for themselves may assist effective employees express their power toward achievement of domain-specific goals surrounded by particular time outlines. In this paper, Conflict Management in the Security Industry is being discussed. From the methods used in the analysis, various conclusions are inferred. The main way of managing the customer expectations is to keep the situation calm and stop customers getting frustrated. The most efficient way to overcome the communication barrier is to move as close to the person as possible. Establishing physical superiority is a recognized strategy for defusing the conflicts. Being threatening is inappropriate in confronting unacceptable behavior. It is forever significant for security functioning to try and view a state of affairs from the customer's point of view since it helps to take the heat out of the state of affairs and permit rational problem solving. A win-win resolution could be achieved at the time of conflict by making a decision that satisfies everyone in the situation. The conflict situations ought to be reviewed to improve the way that similar situations are handled in future. Demanding is convinced and disobliging. One

endeavor to persuade ones enjoy uneasiness at the other's cost to come to an end striking. Deliberation is unassertive and ready to lend a hand—the orbit of conflicting. In this one surrender one self's obtain nervousness to encourage the complementary person's. Cooperating is somewhat confident and partially helpful. An entity comes into sight for an appropriate announcement, which only to some extent gratifies jointly have and the additional person's edginess. Keep away from is unforceful and uncooperative. One tries to not achieve something to contract with or rearrange the divergence, agreeable neither person's trepidation. Work in partnership is confident and cooperative. One endeavor to problem-solve to determine a explanation that entirely make a fuss of both his tenseness and the other's. However different Conflict treatment apparatus is accessible the most used instrument in the safety industry is kept away from and negotiation. It is broadly functional due to the role of the safety employees in the community. The behavior of the quarrels can be explained when it deception crossways two self-governing size namely boldness and supportiveness. Audacity is the level to which one tries to indulge ones acquires anxiety. Successfully may be more able to set detailed work- and nonwork-related objectives and work policy (Raghuram et al., 2003). The behavioral course of actions they locate for themselves may assist effective employees express their power toward achievement of domain-specific goals surrounded by particular time outlines.

11. CONFLICT-HANDLING MODES

The behavior of the quarrels can be explained when it deception crossways two self-governing size namely boldness and supportiveness. Audacity is the level to which one tries to indulge ones acquires anxiety.
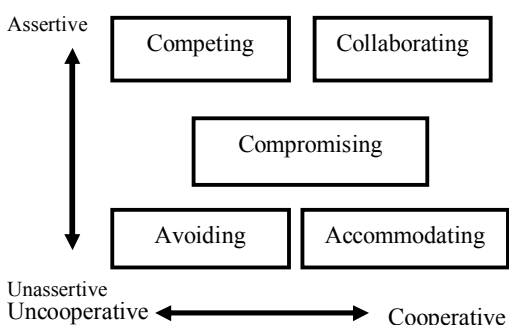

Figure 1 Conflict Handling Modes

Demanding is convinced and disobliging. One endeavor to persuade ones enjoy uneasiness at the other's cost to come to an end striking. Deliberation is

unassertive and ready to lend a hand—the orbit of conflicting. In this one surrender one self's obtain nervousness to encourage the complementary person's. Cooperating is somewhat confident and partially helpful. An entity comes into sight for an appropriate announcement, which only to some extent gratifies jointly have and the additional person's edginess. Keep away from is unforceful and uncooperative. One tries to not achieve something to contract with or rearrange the divergence, agreeable neither person's trepidation. Work in partnership is confident and cooperative. One endeavor to problem-solve to determine a explanation that entirely make a fuss of both his tenseness and the other's. However different Conflict treatment apparatus is accessible the most used instrument in the safety industry is kept away from and negotiation. It is broadly functional due to the role of the safety employees in the community.

12. CONCLUSION

In this paper, Conflict Management in the Security Industry is being discussed. From the methods used in the analysis, various conclusions are inferred. The main way of managing the customer expectations is to keep the situation calm and stop customers getting frustrated. The most efficient way to overcome the communication barrier is to move as close to the person as possible. Establishing physical superiority is a recognized strategy for defusing the conflicts. Being threatening is inappropriate in confronting unacceptable behavior. It is forever significant for security functioning to try and view a state of affairs from the customer's point of view since it helps to take the heat out of the state of affairs and permit rational problem solving. A win-win resolution could be achieved at the time of conflict by making a decision that satisfies everyone in the situation. The conflict situations ought to be reviewed to improve the way that similar situations are handled in future.

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Efficient contribution of solid state drives [SSD] in it infrastructure power management.

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Abstract – To achieve the goals of creating more competent use of IT assets, sinking power depletion, and reducing operational overheads, many companies are spinning to server consolidation and virtualization efforts-accomplishments that upturn server CPU consumption and cut the amount of isolated servers in IT infrastructure. This paper explains about the efficient contribution of SSD to reducing power costs in IT infrastructure with replacement of current HDDs. Power consumption is calculated based on the number of requests per second to storage area for read and writes access.

1. INTRODUCTION

Presently there is an increasing awareness in the storage business for the usage of Solid State Drive [SSD] drives using NAND flash semiconductor memory expertise. Flash drives use moving gate machinery that permits for recollecting data while power is detached and rejects the need for magnetic storage and moving heads. Any time machine-driven apparatuses are involved; a bigger chance for failure happens due to physical apparel. SSDs are also fast, lightweight, and additional power-efficient than old-fashioned magnetic HDDs.

a) Types of SSD

There are two types of SSD. 1) Single Level Cell [SLC] 2) Multi Level Cell.

1) Single-level cell (SLC) SSDs

SLC flash memory stocks data in arrangements of floating-gate transistors, 1 bit of data to each cell. This solo bit per cell approach outcomes in quicker transmission speeds, higher consistency, and lesser power consumption than that delivered by HDDs.

Value	: 0	State: Full
Value	: 1	State: Erased

2) Multi-Level Cell (MLC)

The simple difference between SLC and MLC technologies is storage solidity. In assessment with SLC flash, which permits only two states of affairs to be stored in a cell, thus storing only one bit of data per cell, MLC flash is accomplished of keeping up to four states of affairs per cell, resilient two bits of data stored per cell.

Value	: 00	State: Full
Value	: 01	State: Partially Programmed
Value	: 10	State: Partially Erased
Value	: 11	State: Erased

3) Differences between SLC and MLC

Bits density and capacity of SLC is lower than MLC. And SLC has lower complexity of Data integrity management compare than MLC. Cost per bit, Write endurance and reliability of SLC is higher compare than MLC. Write and programming erase is fastest in SLC compare than MLC.

MLC flash memory can be further delineated into two categories:

a) Consumer-grade MLC (cMLC)

Used in consumer (single user) devices such as USB storage devices, memory cards, mobile phones, and so on.

b) Enterprise-grade MLC (eMLC):

It is designed specifically for used in commercial (multiple-user) enterprise environments.

cMLC and eMLC both have the benefits of sophisticated data compactness and the resulting lower cost-per-bit ratio. For concrete reasons, this is where the comparisons end. The high compactness storage model engaged by both technologies outcomes in lesser write strength ratios. And upper rates of cell deprivation than SLC, greatly sinking the period of the device. For cMLC devices, this does not posture any issues, as the

lifetime probabilities are measured acceptable for consumer-grade devices. This makes cMLC ideal for lower-cost, consumer-targeted devices, where cost and marketplace factors compensate concert and durability. eMLC provides extensive durability through edge of apparatuses and improving certain constraints in the firmware. In accumulation, eMLC SSDs employ over-provisioning data storage capability and wear-leveling procedures that evenly allocate data when the drives are not being comprehensively consumed. These results in a six-fold growth in write cycles and concentrated concerns about cell deprivation. While it does not yet equal the concert and strength SLC, it still outdoes lifetime prospect necessities for enterprise solicitations.

eMLC giving better performance comparing read/write speed of SLC, cMLC and eMLC is. Read/Write speed of SLC per second with 4 block data is 4000/1600, cMLC is 20,000/3000 and eMLC is 30,000/20,000. Durability and Data stability of cMLC is lesser than SLC and eMLC. Also projected life of cMLC is only one year and other 2 has 5 years. High density and los cost per bit of SLC is lesser than other 2 MLCs. Again all the SSD are not same. The SSD from various companies has different characteristics. For example HP [Hewlett Packard] has 3 types of SSD and all those have different characteristics. The three types are a) Enterprise Value b) Enterprise mainstream c) Enterprise Performance. Characteristics of the three SSD as follows

Table 1: Characteristics of HP SSDs

	Enterprise Value	Enterprise mainstream	Enterprise performance
NAND Technology	MLC	MLC	SLC dual port
Sequential Writes [64KiB]	100 MiB/s	225MB/s	300+ MB/s
Random Writes [4 KiB]	300 IOPS	10000 IOPS	15000 IOPS
Sequential Reads [64KiB]	200 MiB/s	230 MB/s	400 MB/s
Random Reads [4 KiB]	30000 IOPS	30000 + IOPS	40000 IOPS

Enterprise value SSDs delivers moderately big storage volumes at low prices, but they does not have the survival of the mainstream or performance SSDs. Enterprise mainstream SSDs have lesser volumes but superior survival than value SSDs. Enterprise performance SSDs from HP have comparable capabilities to mainstream SSDs but have even bigger durability. Also HP ProLiant SSDs ensure power loss protection. It confirms that if the drive drops power

(counting hot plug amputation), it can be prepared in a tiny time. Power loss shield also confirms that user data in write cache writes to the drive. HP SSDs can tolerate power harm without demanding the long-lasting metadata restructure process essential for SSDs without power-loss shield.

A. *Data reliability*

SLC and eMLC solid-state drives consume a number of performances to confirm data immovability and maintenance:

a) Wear-leveling procedures that equally allocate data from corner to corner the drive.

b) Garbage collection that practices a procedure to handpicked the blocks in the memory to wipe out and rewrite.

c) For correctable inaccuracies, the drives use an ECC method (twenty-four 9-bit symbols using Reed Solomon).

d) For uncorrectable inaccuracies, the drives use the Redundant Array of Independent Silicon Elements (RAISE) method, which permits the controller to restructure data that was placed on a miscarried flash page or block someplace else on the drive.

e) For undetectable inaccuracies, there is data path security (CRC-32 bit).

II. DEFINITIONS OF PERFORMANCE MEASUREMENTS

There are many ways to measure the concert of a storage device. Key limitations used in this paper are defined here for reference.

Access Time

It is the period which a program or devices spend to locate the information and make it ready to feed into processing. It is measured in milliseconds (ms).

Sequential Transfer Rate

An amount of data can read or write to the contiguous sectors of the storage in one second by the device. It is measured in megabytes per second (MB/s).

Random Transfer Rate

An amount of data can read or write to the non-contiguous sectors of the storage in one second by the device. It is measured in megabytes per second (MB/s).

Sequential IOPS

Number of Input / Output operations can complete on the contiguous sectors of the storage media in one second. It is measured as read or writes inputs/outputs per second.

Random IOPS

Number of Input / Output operations can complete on the non-contiguous sectors of the storage media in one second. It is measured as read or writes inputs/outputs per second.

A.   IO Performance in SSD

SSD can progress IOPS (input/output per second) more than 10 times quicker than the fastest SAS disk drive which has 15000 rotations per minute accessible for transactional data capabilities. It structures an arbitrary read speed of 25K and an arbitrary write speed of 6K.It can progress as much as 100 times the quantity of IOPS per watt as a 15000 rotations per minute 2.5-inch SAS HDD in solicitations where higher concert and lower power intake are both required. SSD drives reads data consecutively at 230MB per second and writes consecutively up at 180MB per second. Also, SSD pulls a lesser amount of power from the wall than standard HHDs. SSD consumptions is only 1.9 watts of power in fully utilization mode and 0.6 watts in slow-moving mode, reducing power and hotness loads. A classic 15K HDD eats from 8 to 15 watts in full of life mode and 1 to 2 watts in slow-moving mode.

B.   Enactment versus Capability

        The prime influence that shakes SSD enactment is the percentage of writes versus reads for client solicitations. SSD Write enactment can be 10x leisurelier than Read enactment. Write enactment be subject to on how frequently time is disbursed removing a chunk of flash memory earlier to writing the binding data. The new SSD will progress write requirements without demanding to remove any chunks, so it will be faster without any erase steps involved. On one occasion an SSD consumes in use for certain period of time, all the chunks may have been cast-off and the binding data is spread all over the chunks. To progression a different write data demand in this circumstance, the SSD required to permit up a chunk. It prepares so by collecting the chunk's data, removing that block, introducing the different data and writing the whole data into the recently removed chunk. To moderate this erase-before-write consequence, completed provisioning is secondhand by the manufacturer to deliver pre-erased chunks.

    In excess of provisioning permits for the straight writing of data into the over provisioned or "hidden" chunks of planetary in the forefront procedures. In background, a onslaught repetitive of touching the data commencing the "hidden" area into the user area happens. This onslaught procedure of liberation up and removing chunks occurs in the background and is accomplished to confirm that supreme writes to the drive do not need the leisurelier remove stage proceeding to writing to the subdivision. Consuming more "hidden" capability in "free" chunks obtainable to the SSD allows for significantly sophisticated write enactment.

C.   Square Deletion

    NAND memory is organized in squares for faster access and deletion. Squares can change in size but are greater than OS pages and standard HDD 512 byte

areas. For any glimmer unit to be customized (composed), the cell should first be eradicated. Streak memory can just be eradicated a piece during that timeframe. Deletion comprises of setting all bits in the square to 1. Once deleted any cycle might be modified, but once the spot is situated to zero it can just be deleted by setting the whole piece to 1.

D.   Junk Accumulation and TRIM

    Information is normally composed to SSDs in pages but should be deleted in heftier units called squares. Trash accumulation in an SSD is the demonstration of moving and consolidating the valid pages into brand new pieces with the goal that incompletely filled squares might be deleted and made good to go for revamped information. By its inclination refuse gathering needs a read and compose of information. TRIM is a summon backed in OS Windows7 and in select outlet's apparatuses that will can tell SSDs that everything pages within a square are no longer in utilization and might be eradicated. TRIM gives the segment and page informative content to the SSD and diminishes the waste gathering and most critically decreases the number of composes needed.

E.   Memory Wear

        Streak memory has a limited number of systems-eradicate cycles or P/E cycles. A SSDs firmware and fittings is outlined to alterably remap squares with a specific end goal, which is to spread compose operations out, drawing out the existence of the unit. This strategy is called wear leveling.

F.   Peruse exasperate

    In the event that a NAND memory unit is perused over and over again countless many times without an edit of surrounding units it is conceivable to update the worth of the surrounding cells. Controllers track sum peruses crosswise over the NAND apparatus and adjust the surrounding cells to relieve peruse aggravate slips.

G.   Overprovisioning

    SSD producers hold a certain measure of NAND memory, keeping it covered up from the OS with the goal that it has space to for a time save information in the midst of refuse accumulation and wear leveling exercises. This permits even sensibly full SSD drives to look after a sensible appearance level and in drill has the profit of upgrading reliability and developing the usable essence of the SSD.

    The measure of over provisioning fluctuates by gadget. Mainstream/client units are in the reach of 7% to 10% while gadgets centered on the enterprise/server business sectors are more excellent than 20%.

H.   Compose Perseverance

        Streak apparatuses uphold a restricted number of composes and will at the end of the day miss the mark if the unit encounters an excessive amount of composes. Wear leveling functional processes encourage expanding the existence of a glimmer

apparatus by spreading composes uniformly crosswise over the apparatus. One inconvenience as NAND geometries psychologist is that fewer electrons for each unit are ready to reliably control the NAND unit state, which advances to diminished crude compose continuance at the NAND cell level. This needs more progressed administration and Lapse Redressing Codes to balance the expanded touch slip rates. To re-order matters, makers will normally quote compose perseverance in Terabytes Composed (TBW) dependent upon the underlying innovation of the NAND gadget considering the wear leveling, ECC, and administration ordered system dependent upon regular access plans.

III.   COMPOSE INTENSIFICATION

This is the degree of keeps in touch with the NAND gadget isolated by the aggregate number of composes needed to the NAND exhibit. This proportion gives a metric for quantifying the overhead of the administration functional processes specified previously. The workload incorporating the information access design and inhabitance rate of information on the drive will influence the compose intensification.

IV.   SSDS AND INFORMATION MAINTENANCE

Data maintenance is the fitness of a space unit to hold information following you evacuate it from aid. SSD information maintenance aspects are special from the aforementioned of universal plate drives. Several elements control a SSD's information maintenance:

➢ The ratio of the SSD is remaining persistence (lifespan) when you uproot it from aid.

➢ The SSD's working temperature when it was in utility

➢ The temperature you store the SSD at following uprooting it from utility.

The information maintenance period of a SSD is as a matter of fact more terrific when you work the SSD at higher managing temperatures while it is in aid and archive it at more level temperatures once you uproot it from utility. As an illustration, a SSD managed at 50°C and saved at 30°C might as well hold its information for 28 weeks assuming that you evacuate it from utility at the closure of its evaluated perseverance.

The imperative thing to recollect is that a SSD has a confined information maintenance window once you uproot it from aid. This is special from circle drives, which normally hold information for a considerable length of time. In the event that a SSD has utilized the sum total of its appraised continuance, the just genuinely sheltered surmise that you ought to cause when to be removing it from utility is that it should not hold its information for any huge period.

V.   COMPREHENDING SSD APPEARANCE ATTRIBUTES

Because Strong State Drives are good with the SAS and SATA interfaces, you would be able to measure their read and compose display utilizing the same instruments measuring circle drive exhibition. However their underlying space innovation is special from that of plate drives. Accordingly, their appearance aspects are additionally notably better. With SSDs, we should re-inspect our presumptions about space exhibition and grasp how SSD exhibition updates in offbeat dominions and under special workloads.

VI.   MEASURING SSD EXHIBITION

SSDs are skilled for the purpose of transporting remarkable appearance, absolutely for erratic I/Os for every second (IOPS). You are able to measure SSD appearance by utilizing IO meter or different instruments to contrast it and that of a circle drive. Yet you'll reveal that a SSD's display can change essentially every time you run the same test unless you utilize the correct strategy. We would be able to ascribe the aforementioned contrasts to the differing overhead of the grounding administration jobs connected with the NAND memory structural planning.

VII.   SSD NAND CONGLOMERATION AND APPEARANCE

In expansion to satisfying read/write asks for, a SSD controller is executing base level jobs to maintain the NAND memory. They incorporate NAND square administration to support a pool of unhindered squares, and information re-mapping assignments connected with wear-leveling. The level of grounding action can differ altogether, receivable to some degree to the group of the NAND information and the sort of read/write action going ahead. The adapting level of underlying level movement sways SSD exhibition.

VIII.   SSD IS COSTLIER?

There are many blogs and articles about the price comparison of SSD with HDD and explaining the cost of SSD is much greater than HDD. Really it is not costlier compare than HDD based on performance. When calculating the better value for money based on the performance it is equal. The below table will explain about the value of money.

Table 2: Better performance equals to money.

	15K SAS HDD	SAS SLC SDD	SAS MLC SDD
No. of Drives	25	4	4
Size in GB	146	400	400
RAID	RAID - 5	RAID - 5	RAID - 5
IOPS	2600	16300	16100
Watts of Power	225	36	36
Cost per IOPS	$5.72	$2.97	$1.54

IX. INFORMATION SECURITY AND DISPOSAL

There are diverse routines for information assurance and end in blaze strong state drives (SSDs), relying on the security level needed within every provision. Security methods might be isolated into a couple classes:

➢ Data insurance
➢ Data disposal
➢ Media obliteration

Methods of information insurance incorporate compose assurance, watchword assurance and encryption. Encryption is not a system utilized today within military provisions, because of situations identified with crux administration. Secret key security might be utilized within synthesis with a biometric key to enable a security plan that is dependent upon "what you have, what you know, who you are". Data disposal is took care of by Clear and Clean methods. Which routine ought to be actualized relies on the security grouping level of the group in which the requisition dwells. Commonly, if the unit will stay within the same security grouping, a Clear technique will suffice. Assuming that it is moved to a higher security characterization level, the unit ought to be truly de-ordered, and a clean strategy is wanted. Moving the unit to an easier security order could need obliteration of the drive. Disinfecting a unyielding state drive is much speedier and needs fewer cycles of the same system when contrasted with hard circle drives, after SSDs encounter far easier levels of information changelessness. Finish media annihilation might be an answer if a Purify technique is excessively drawn out and the information ought to be killed and obliterated in a matter of seconds.

X. SECURITY IN UNYIELDING STATE DRIVES VS. HARD PLATE DRIVES

Implementing security emphasizes that need information disposal or media pulverization are far additional unpredictable for hard plate drives beyond unyielding state drives because of their underlying space innovation. For instance, hard plate drives desert a much larger "phantom-representation" once information is composed to them. This needs additional complex and longer information disposal techniques beyond could be required for strong state drives. Media devastation in hard plate drives can just be comprehended by utilizing expansive and massive degausses, physically decimating the drive, or utilizing chemicals that render the surface of the drive unreadable. Strong state drives, additionally, are more suitable for media devastation, because of their underlying silicon innovation. The requirement for complex information end and media demolition strategies stems from the level of information lastingness of that specific space media. Lastingness is the charge deserted in a medium following an outer attractive field is evacuated. The humbler the information changelessness on the space media, the more effortless information disposal systems might be actualized. The following areas audit information changelessness on hard circle drives and robust state drives.

Data perpetual quality in NAND streak is fundamentally brought on by an alleged sizzling-transporter impact; where electrons move toward getting trapped in the entryway oxide layer and can stay there as abundance charge. The measure of trapped charge might be dead set by measuring the door-prompted empty leakage current of the phone, or indirectly by measuring the edge voltage of the phone. The impact is more obvious in new units, and ends up being less recognizable following 10 program/erase cycles. Erasing the cell will essentially decrease the sum of trapped electrons, making it hugely demanding to recoup any information from the unit following an eradicate cycle.

A. Information Changelessness in Hard Circle Drives

When information is composed to an attractive medium, the compose head-sets the extremity of most, but not the sum total, of the attractive substrate. This is halfway because of the failure of the compose head to compose in precisely the same area every time, and in part because of the changes in media affectability and field solidness around gadgets as time marches onward. When a "1" is composed to a plate, the media records a"1". When a "0" is composed, the media records a"0". Notwithstanding, the true impact is closer to getting a 0.95 when a "0" is overwritten with a "1" and a 1.05 when a "1" is overwritten with a"1". Deviations of the drive head from the initial track may leave noteworthy partitions of the past information in the track edge. Normal circle hardware is situated up with the goal that both the aforementioned qualities are perused as "1", but utilizing honed apparatuses for example an attractive constrain magnifying instrument, it is feasible to perused what past "layers" held. To guarantee a complete disposal of a "phantom-representation" on an attractive plate drive, several strategies might be accompanied:

a) Degaussing the media by applying a backwards (coercive) charging constrain so as to decrease the association in the middle of past and show information to a focus that there is no known method for recuperation of past information.

b) overwriting the media with various times with different plans, a one-time delete of the media should not suffice, and military principles determine up to four clean cycles of eradicate and design-overwrite.

Yet, consistent with industry suggestions, a design overwrite of up to 35 times is needed to altogether clear formerly held information from the media.

Test case with Microsoft Exchange Email

The storing necessities for email servers can differ depending on the size and number of Emails and the type and amount of users. Small email servers may want only restricted storage and landscapes, but big commercial email servers generally need more storing capability and a great level of accessibility, concert, and scalability. I/O outlines will differ conditional on the amount of users and the extent of emails and their supplements.

The following table explained about the Configuration parameters for the test.

Table 3: Configuration Parameters for test

Config Parameters	15K SAS HDD	SATA SSD from intel
No.Of Drives	**32**	**4**
OS	Win 2003	Win 2003
IOPS	3834.843	10650.201
Initial db size	52431306752	52433403904
Final db size	62529224704	71467286528
db files count	1	1
Thread count	73	17
Log Buffers	9000	9000
db cache min val	32 MB	32 MB
db cache max val	256 MB	256 MB
insert operations	40%	40%
delete operations	30%	30%
replace operations	5%	5%
read operations	25%	25%
Idle	55%	55%

Based on the about configuration parameters for the test in Microsoft Exchange server, the database utilization results based on the sub disk system performance and host system performance is given below.

Table 4: Sub Disk System Performance

Database [D:]	HDD	SSD
Avg.DiskSec / Read	0.007	0.001
Avg.DiskSec / Write	0.006	0.003
DiskReads/second	2738.09	7458.635
Disk Writes/second	2375.741	6741.634

The following table contains the host system performance.

Table 5: Host system performance with HDD

Results	HDD		
Counter	Average	Min Val	Max Val
% of Processor Time	4.843	1.852	9.420
Available MB	9442.064	9188.000	9502.667
Free System page table entries	22346304.584	22346294.667	22346668.000
Transition Page repurposed/sec	0.000	0.000	0.000
Non Paged Bytes	44350520.889	43237376.000	44919466.667
Paged Bytes	43546350.933	43433984.000	44646400.000
Database page fault stalls/sec	0.047	0.000	0.889

Table 6: Host system performance with SSD Power Depletion

Results	SSD		
Counter	Average	Min Val	Max Val
% of Processor Time	11.799	9.235	15.624
Available MB	9541.259	9533.333	9545.333
Free System page table entries	22346941.333	22346937.333	22346937.333
Transition Page repurposed/sec	0.000	0.000	0.000
Non Paged Bytes	44031817.956	42876928.000	44564480.000
Paged Bytes	37097358.223	36962304.000	38360405.333
Database page fault stalls/sec	1.167	0.000	4.712

SSD need lesser power compare than HDD. Also as SSD generate lesser heat compare than HDD, because of no motor mechanism, so it is reducing the power cost indirectly for cooling needs in IT infrastructure. Similar way the less number of SSDs giving better performance compare with more number of HDDs. In this case it is not only the direct power saving and indirect cooling costs, Also it is saving more power because of giving better performance in a short time period for read and write access.

a)   *Power performance based on actions*

Following table explains the time taken for each action using SSD and HDD on PC with Win7 operating system. Performance progress will differ hooked on system formation, weight on the system through boot, request and data individualities and a user's workflow.

Table 7: Result of performance to given action.

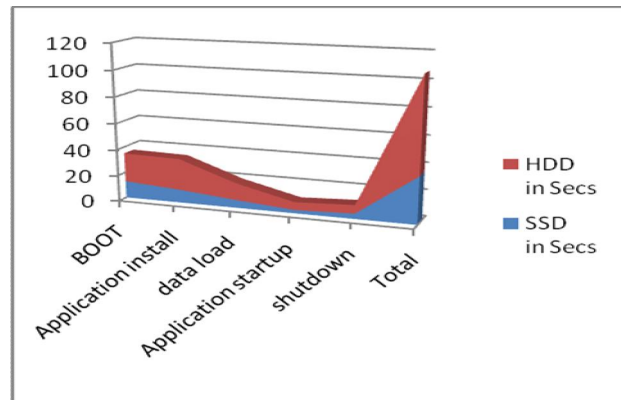| Actions/Drives	SSD in Secs	HDD in Secs
BOOT	13	22
Application install	10	24
data load	6	13
Application startup	2.5	6
shutdown	4	6.5
Total	35.5	71.5

Chart 1: Result of Performance to given actions.

b) *Power performance based on IOPS*

To demonstrate the significance of this, beside with the value of high random read IOPS, we can prototypical the power savings of the SDDs vs. enterprise class 15K RPM HDD. Below is an example where an application needs 248865 IOPS. From table 2, The Enterprise Class HDD 2600 IOPS per Drive and the equivalent drives for the given IOPS are 248865/2600 = 95 drives. SSD 16,300 IOPS per Drive and the equivalent drives for the given IOPS are 248865/16300 = 15 drives

At an estimated 15 watts power,

a) An HDD devours 130 kWh per year. This costs $19.50 per drive per year (assuming $0.15 / kWh).

b) A SSD draws only 2.5 watts of power and consumes just 22 kWh per year. This cost is $3.30 per drive per year.

Total HDD Energy Cost per year is $1852.50 [95 drive x 19.50]

Total SSD Energy Cost per year is $49.50 [15 drive x 3.3]

Therefore the Power saving per year using SSD is $1803. Just it is for single application which needs 248865 IOPS.

Conclusion

SSDs are speedily emerging with concert that previously covers hard disk drives in many characteristics. Each age group of SSDs tends to get deeper and wilder. Results to SSD limitations, as well as reduced random write concert, are as a final point coming to market. Collected, these indemnify a growth in acceptance of SSD storage solutions in concert precarious enterprise servers.

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Time Management Challenges among Jordanian Nurse Managers

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Abstract: Time management has been recognized as an essential work element for all nurses. Consequences related to ineffective time management such as deterioration in the quality of care, job dissatisfaction, stress and burnout, role overload, and role ambiguity are potentially serious, not only for nurses and nurse managers, but also their clients, colleagues, families and the entire organizations where they are employed. **Aims:** The study aimed to find out problematic areas among nurse managers in Jordan across various managerial levels (first, middle, and top-level managers) and explore any relationship between the sample's demographics and their abilities to manage time effectively. **Methods:** A quantitative, descriptive, cross-sectional research design was utilized to meet the goals of this study. A total number of 171 nurse managers at various managerial levels who agreed to participate in the study from selected governmental and private hospitals in Amman and Zarqa, Jordan constituted the study sample. A modified questionnaire was utilized to identify time management issues of nurse managers. **Results:** Nurse managers had a satisfactory mean score ($M \geq 1.5$) in all of the questionnaire's dimensions, except top-line-managers only in the technique dimension with a mean score of (M=1. 40). Leaving tasks uncompleted, telephone conversations that stopped work and difficulties to finish work-related conversation were the major identified time management problems for top-level managers (M=1.12; M=1.25; M=1.38 respectively). All of the study sample demographic characteristics showed no significant statistical differences except for the type of hospital in favor of private hospitals' managers (*P*=0.006 & M=2.24; 2.14). **Conclusion:** The current study concluded that top level managers lacked the technical skills for time management.
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1. Introduction

Time management skills have become progressively important predictors of managers' success in today's organizations. Many health care organizations have cut back their processes and flattened their structures in an attempt to accomplish more efficient performance and decrease costs. Thus, effective time management skills are especially important for managerial success in the newly restructured health care organizations (Arnold & Pulich, 2004).

Today, managing time is an important issue for both individuals and organizations. The core of time management is not to control time by itself, but to control the ways people use time to improve their lives. Effective time management leads to success by reducing stress, maintaining balance, increasing productivity, and setting and achieving goals. From this broad perspective, the real value of time management is to enhance one's own life. In other terms, time management provides people with better quality of life, not with more time (Alay & Kocak, 2002).

Background

The phenomenon of time management has been identified in a variety of human professions, such as childcare, supervision, and nursing (Litchfield & Chater, 2007). It has been recognized as an essential element of work for all nurses with an impact that mostly affects how nurses work and feel about their job (Bowers *et al.,* 2001). It also affects their patients' outcomes (Bowers *et al.,* 2001). Time management includes aspects of communication, planning, prioritization, and delegation (Finkelman, 2006). Additionally, time must be viewed as a process that is ever changing and must be under one's own control (Hackworth, 2007). Using time management skills wisely requires both leadership capabilities and managerial functions.

Nurse managers, as other managers, have four types of resources which are: personnel, equipment, finance, and time. Only time is the limited and the most valuable one (Pearce, 2007). From this point of view, effective time management, which leads to optimal utilization of the available time, gained its importance. Moreover, the nursing shortage and the decrease in funding put many healthcare organizations in a place where they are trying to do more during a shorter time (Marquis & Huston, 2012). Also, effective time management has been reported to reduce stress, which is very beneficial in today's stressful health care environment (Litchfield & Chater, 2007). Time management skills are important not just for nurses on their work lives, but

in their personal lives as well. They allow nurses to make time for fun, friends, exercise, and personal development. Therefore, all levels of nursing staff need to practice time management (Kelly-Heidenthal, 2004).

Consequences related to ineffective time management are potentially serious, not only for nurses, but also for their clients, colleagues, families, and the entire organizations where they are employed. There are some anecdotal evidences that correlate ineffective time management with deterioration in the quality of care, job dissatisfaction, stress and burnout, role overload, and role ambiguity. (Litchfield & Chater, 2007).

In the current study, the following operational definitions were used: The first -level manager (FLM): is the person responsible for supervising non-managerial personnel and day-to-day activities of specific work units. The middle-level manager (MLM): is the person who supervises first-level managers within a specified area and is responsible for the people and activities within those areas. The top-level manager (TLM) is the person responsible for establishing organizational goals and strategic plans for the entire division of nursing (Marquis & Huston, 2009).

Literature about time management in nursing is mainly anecdotal, although studies on nurses' work organization have found out that time management is problematic (Bowers *et al.,* 2001). Most of the nursing literature about time management provides a number of tips on how to manage time, along with descriptions of processes or strategies. These strategies focus on prioritizing tasks, but the stage at which this should occur varies between authors (Waterworth, 2003). As a result, nursing literature displays that time management's difficulties are common for nursing graduates. For example, Litchfield and Chater (2007) revealed that managed time was definitely difficult for nurses working in a neonatal unit. Consequently, additional nursing researches in the topic of time management would benefit many nurses and nurse managers.

2. Methods
Aims:
This study aimed to:
1. Identify time management problems across various managerial levels (first-level, middle-level, and top-level managers).
2. Identify the relationship between the demographic characteristics of the study sample and their time management abilities.

Design:
A quantitative, descriptive, cross-sectional research design was utilized to meet the goals of the current study.

Instrument:
The time management questionnaire used by Kisa and Ersoy (2005) was adopted in the current study to determine time management issues among various nurse managers in the selected hospitals. This questionnaire is a modified version of the one Erdem (1997) developed to investigate the abilities of time management among top-level hospital administrators in Turkey. This instrument is a self-administered questionnaire that consists of five dimensions, namely: priorities, workload, delegation, schedule, and technique. The scoring system for the instrument is a 3-point Likert scale (no = 1, sometimes = 2, and yes = 3). A pilot study of 15 nurse managers was conducted to assure the clarity and the relevancy of the questions. No modifications were needed based on the results of the pilot study. Test-retest had been conducted to confirm the reliability of the study; it resulted in an overall reliability of (0.95). Regarding the scoring system for the current study a mean score of ≥1.5 was considered as an indicative of satisfactory time management skills.

Settings:
A total number of eight hospitals; three governmental and five private hospitals in Amman and Zarqa governorates in Jordan were selected. Amman and Zarqa governorates were selected because both are the largest cities in Jordan regarding its inhabitants. The only inclusion criterion was any hospital that had a bed capacity of 120 beds or more. Hospitals with such a capacity are accredited hospitals for health care students' training; which could increase nurse managers' workload.

Participants:
All nurse managers at various managerial levels in all of the selected hospitals who agreed to participate in the study were included, whether they were novice or experienced nurse managers. A total number of (n=171) nurse managers participated in the current study.

Data collection:
After official written permissions were obtained from the selected hospitals; data were collected through the designated questionnaire. All nurse managers at various managerial nursing levels who accepted to participate in the study were enrolled in the study sample. Each nurse manager was asked to respond to the questionnaire which takes between 3-5 minutes to complete. Data collection took 6 months from March to August 2011.

Ethical considerations:
An official permission was obtained to utilize the modified the instrument for collecting data from the original authors. Data were collected after official permissions were obtained from the selected hospitals. Confidentiality was granted for all of the

study participants through the anonymity of data collection. Participants were assured that the participation was optional and they could withdraw from the sample at any time without any risks. Additionally, consent forms were obtained from each participant, and a brief explanation about the study was conducted to each participant prior to data collection by research assistants.

Data analysis:

For analysis purposes; data were coded and entered into the Statistical Package for Social Sciences (SPSS) Version 11 software. In order to achieve the objectives of the study, frequencies to describe the study sample, means, standard deviations, T-tests, and one-way ANOVA tests were conducted to explore the relationships between the participants' managerial levels and the demographic characteristics and the their time management abilities. $p \leq 0.5$ indicated a significant statistical difference. Higher mean scores indicated more abilities to manage time except for negatively stated phrases.

3. Results:

Table (1) shows the demographic characteristics of the study sample. The table showed that more than half (59.6%) of study sample were from private hospitals; Males participants constituted less than half of the female participants; the majority of the study sample (69%) was married and more than half (52.1%) of the study sample had more than one child. First-level managers constituted more than (68%) of the study sample; and around (70%) of the study sample had previous experience with time management programs.

Table (2) shows time management issues across the three levels of managers (first, middle, and top-level managers). The table showed significant statistical differences between the both of priorities and workload dimensions (P=0.5 & P=0.5 respectively) and top-level managers (M=2.63 & M=2.44 respectively). Significant statistical difference was also seen in the technique dimension but with higher mean scores in the both of middle-level and first-level managers than the top-level managers (M=1.90; M=1.85 & M=1.40 respectively). On the other hand, both of the delegation and the schedule dimensions showed no significant statistical differences.

The table also showed the following time management problems in the technique dimension among top-line managers, which are: leaving tasks uncompleted, interrupting telephone conversations, and difficulties to finish work-related conversations respectively (M= 1.12; 1.25; 1.38). An interesting finding was that there were no unsatisfactory (M<1.5) time management abilities among both first-line and mid-line managers.

Table (3) represents the relationships between time management abilities and the demographic characteristics of the study sample. The table showed that there were no significant statistical differences among gender, experience with time management programs, marital status, number of children, and managerial levels and the dimensions of time management. However, the table indicated a significant statistical difference in the abilities to manage time in favor of private hospitals as opposed to governmental ones with (P=0.006 ; M=2.24 & M=2.14 respectively).

Table (1) Demographic characteristics of study sample (n=171)

Items	n	%
Type of hospital		
Governmental	69	40.4
Private	102	59.6
Gender		
Male	58	33.9
Female	113	66.1
Marital status		
Married	118	69
Single	50	29.2
Widowed	1	0.6
Divorced	2	1.2
Number of children		
None	65	38
One child	17	9.9
More than one child	89	52.1
Experience with time management programs		
Yes	120	70.2
No	51	29.8

Table (2) Time management issues across the three managerial level

Items	FLM		MLM		TLM		F	P
	M	SD	M	SD	M	SD		
Priorities	2.53	0.32	2.41	0.36	2.63	0.17	3.00	0.05*
Main tasks and responsibilities.	2.91	0.34	2.89	0.38	3.00	0.00	0.35	0.70
Time needed for each activity each day.	2.68	0.55	2.70	0.55	3.00	0.00	1.34	0.26
Most important activity in your job.	2.72	0.51	2.61	0.61	2.50	0.54	1.14	0.32
Have enough time to consider most important tasks.	2.47	0.66	2.48	0.72	2.88	0.35	1.38	0.26
Spend more time on routine than unusual tasks.	2.36	0.64	1.87	0.78	2.12	0.64	8.70	0.00*
Activities for next year for 3 to 5 years.	2.05	0.82	1.89	0.82	2.25	0.89	0.96	0.39
Workload	2.21	0.45	2.08	0.38	2.44	0.32	3.07	0.05*
Feel stress or anxious about performing tasks on time.	2.27	0.68	2.28	0.62	2.00	0.93	0.64	0.53
Feel have more tasks than you can do.	2.29	0.64	2.04	0.67	2.62	0.74	3.81	0.02*
Sacrifice your social activities for your job.	2.26	0.65	1.96	0.73	2.38	0.74	3.77	0.03*
Say yes for extra tasks when you are busy.	2.00	0.72	2.02	0.68	2.75	0.46	4.31	0.02*
Delegation	2.42	0.40	2.33	0.36	2.31	0.51	1.06	0.35
Consider task delegation when make plans.	2.42	0.69	2.46	0.75	2.75	0.71	0.82	0.44
Consider task delegation is an important part of your job.	2.44	0.62	2.35	0.74	2.62	0.74	0.73	0.48
Perform tasks yourself than delegate them.	2.47	0.62	2.30	0.59	2.00	0.76	2.94	0.05*
Feel pressured by deadlines even when delegate tasks.	2.34	0.67	2.20	0.75	1.88	0.84	2.13	0.12
Schedule	2.13	0.43	2.01	0.46	1.91	0.38	2.21	0.11
Awareness of having time for extra tasks.	2.46	0.62	2.35	0.67	2.75	0.46	1.52	0.22
Feel unable to finish daily schedule tasks in one day.	2.19	0.69	1.87	0.69	1.50	0.76	6.29	0.00*
Arrive late for your appointments.	1.97	0.79	1.85	0.79	1.75	0.71	0.64	0.53
Bring work home or stay late after work.	1.91	0.79	1.96	0.67	1.62	0.74	0.65	0.52
Technique	1.85	0.52	1.90	0.51	1.40	0.28	3.36	0.04*
A lot of documents waiting to be read.	1.91	0.81	2.17	0.68	1.75	0.89	2.20	0.11
Meetings are a waste of time.	1.99	0.75	1.93	0.74	1.50	0.54	1.68	0.19
Difficult to finish work-related conversations.	1.87	0.66	1.89	0.71	1.38	0.52	2.16	0.12
Your telephone conversations stop your work.	1.82	0.79	1.83	0.77	1.25	0.71	2.03	0.14
Leave your tasks uncompleted.	1.65	0.74	1.67	0.70	1.12	0.35	2.13	0.12
Total	2.53	0.32	2.41	0.36	2.63	0.17	3.00	0.05*

$P \leq 0.05$

Table (3): The relationships between the demographic characteristics of the study sample and the time management abilities.

Sample's characteristics	M	SD	T	F	P
Gender			0.07		0.95
Male	2.20	0.24			
Female	2.20	0.24			
Type of hospital			2.80		0.006*
Governmental	2.14	0.21			
Private	2.24	0.25			
Experience with time management programs			0.63		0.53
Yes	2.20				
No	2.22				
Marital status				1.83	0.14
Married	2.19	0.24			
Single	2.24	0.23			
Widowed	1.88	0.00			
Divorced	1.99	0.00			

Number of children			1.40	0.25
None	2.22	0.24		
One child	2.26	0.24		
More than one child	2.17	0.23		

P≤0.05

4. Discussion:

This study was a quantitative, explorative, descriptive study that aimed to find out problematic areas among nurse managers in Jordan and explore any relationship between the sample's demographics and their abilities to manage time effectively. Although the results revealed areas of strengths, they will not be discussed here since they are not the focus of this research, see Table (2). All of the identified problems (challenges) were found among top-level managers and only in the technique dimension. Worryingly, top-level mangers are responsible for making important decisions that affect the entire organization, which makes this finding a very serious one. The problematic areas were in order: leaving tasks uncompleted, being interrupted by telephone conversations, and difficulties to finish work-related conversations. The later two problems will eventually lead to the first one. In other terms, Not being able to finish conversations in the right time along with being constantly interrupted by telephone calls will lead to not being able to accomplish tasks in a timely manner. One solution to this problem is to focus on a single task at a time, this will lead to better time management skills ,which in turn will lead to a better work efficiency, or in other terms, being able to complete tasks (Kiefer, 2011). Although multitasking is becoming a popular concept, is it not applicant to some certain tasks that needs focusing (Kiefer, 2011). As Collins & Collins (2004) reported, the essence of effective time management is doing the right task at the right time. From the findings of this study, to be able to do so requires a reduction in telephone conversations to as many as possible and for work-related conversations to end as scheduled. According to Perlow (1998) , the solution for this endless cycle is to plan for uninterrupted working time. Hills (2008) reported that having a clear mission statement in life and eliminating activities that contradict with this mission are very essential for effective time management. It is important to say that having general aims is not the same as planning. Planning should happen in a very meticulous manner and in advance to the work day, not during it (Thomack, 2012). One strategy to do this, is to keep a daily log of how time is being spent which could show activities that waste time, and then, developing strategies to avoid these activities (Collins & Collins, 2004). Knowing where time is being used is the first step to manage time effectively (Thomack, 2012).

This will eventually help into creating an efficient plan which is necessary for effective time management (Collins & Collins, 2004). Careful planning does not mean that there will be no interruptions. So minimizing interruptions is as important as having a detailed and well-established plan. A key factor for minimizing interruptions is by amending the practices of troublesome employees and creating a work structure that responds quickly to change (Kenner & Pressler, 2006). Another way to do so is by discovering employees' potentials and utilizing them by delegating responsibilities (Birla, 2008). Managers can have prolonged unscheduled work-related conversations because they have some kind of hesitations when they have to make a major decsion, such as the ones that top-level managers usually take. Ghoshal & Bruch (2004) suggest that managers should trust their own decision-making ability to be able to manage time more effectively. The only demographical factor that affected time management abilities was the type of organization, with more effective time management in the private hospitals than the governmental ones. Leggat & Dwyer (2005) reported that the organizational culture is often the factor that gets blamed whenever there is an inadequate performance, but really it is the management skills that affect the productivity level. In other terms, we should not jump to accusing governmetal hospitals of ineffective time management. So, this finding should be further investigated. What was interesting in the results is the lack of a significant statistical difference between managers who took time management courses and those who did not. This really questions the effectiveness of these courses.

Conclusion and recommendations:

The current study concluded that top-level nurse managers had poor time management skills regarding the technique dimension. Developing effective time management courses and not just repeating the same courses should be done to all nurse mangers, and especially, for top-level managers. Nurse managers from private hospitals had better time management skills than those nurse managers from governmental hospitals which is a recommendation for future researches.

Limitations:

Literature about nurses' time management issues is very little (Waterworth, 2003), which in turn could have affected the current study. Also, the limited top-

level managers number who participated in this study could also limit the study's generalizability.

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AN EFFICIENT DATABASE SYNCHRONIZATION FOR MOBILE DEVICES USING SAMD ALGORITHM

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ABSTRACT: A Database Synchronization Algorithm for Mobile Devices recommends the SAMD (Synchronization Algorithms based on Message Digest) algorithm based on message digest in order to aid data synchronization between a server-side database and a mobile database. The SAMD algorithm makes the data at the server-side database and the mobile database uses message digest tables to compare two data's in order to select the rows required for synchronization. If the two data's are different, the synchronization progresses according to synchronization policy. The SAMD algorithm does not use techniques that are reliant on specific database vendors: neither does it use triggers, stored procedures or timestamps. The SAMD uses only the typical SQL functions for the synchronization. Therefore the SAMD algorithm can be used in any mixtures of server-side database and mobile database because of its objectivity of database vendor.
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Key Words: Synchronization, adaptability, mobile database, client, server.

INTRODUCTION:

Recent advances in mobile technology and equipment have led to the emergence of a new computing environment and a variety of small sized mobile devices such as PDAs (personal digital assistants), smart mobile phones, HPCs (handheld PCs) and Pocket PCs have been popularized. As various network technologies are increasingly being associated with such mobile devices, the processing of business information can be available using mobile devices. As a result, business models that rely on mobile technologies are appeared. Mobile devices do not have much computing power and rely on batteries. Additionally, constant access to network is difficult due to narrow bandwidth. Therefore, it is not easy to process a large size of stored data and maintain a continuous connection with the server-side database. For these reasons, mobile devices have mobile databases in order to achieve stable data processing. Mobile devices download replications of limited data from a connected server-side database using a synchronization device that has a stable wire communication function. Mobile devices process various tasks using the data downloaded in an off-line state. The work on the network disconnected condition is a crucial point for mobility support.

In a disconnected environment, there are inevitable inconsistencies between the server-side database and the mobile database. Synchronization techniques can solve the data inconsistencies and guarantee the integrity of the data. Consequently, synchronization is an essential subject in mobile device computing environments. Commercial DBMS venders offer various solutions to data synchronization in a mobile environment. However, these solutions are not independent of the server-side database because they use database dependent information such as metadata or use specific functions of server-side database such as trigger and time stamp. In other words, the mobile database vender should be equivalent to the server-side database vender. The solution of operating a separate synchronization server in the middle tier is independent of the server-side database but dedicated to the mobile database. That is, the synchronization solution and the mobile database should be the identical vender product. Because of these restrictions, the extensibility, adaptability and flexibility of mobile business systems are markedly decrease. This problem must be solved in order to build efficient mobile business systems because upcoming mobile environments will have heterogeneous characteristics in which diverse mobile devices, mobile databases, and RDBMS exist.

1.2 Synchronization:

Good Synchronization is a file synchronization tool that enables user to backup user files and/or synchronize them with another location such as a different drive, folder, USB drive, network location or Amazon S3 storage account. The program supports one-way and two-way synchronizations, it can propagate deletions and check for conflicts, which can be reviewed and approved before executing the synchronization. User can also execute

jobs automatically when a removable device is connected, periodically, or schedule via Task Scheduler. Other features include file filters and exclusions, support for time shifts, chained syncing, backup of deleted files and more.

1.3 Smart Synchronization Mechanism:

The synchronization method for all applications based on Smart Synchronization has the following features:

Many of the features in the synchronization components of Smart Synchronization are intended in such a way that they promise in-order message processing and one-time message delivery at all times. The message delivery assurance is the accountability of the synchronization layer. The architectural diagram for smart synchronization is represented in Fig: 1. each message from a device is measured in Smart Synchronization with an eminence. The administrator can view each of the messages in different states.

Smart Synchronization is a context that is particularly intended to offer the development tools and synchronization features essential for offline applications. Smart Synchronization methods are, therefore, usually accomplished in asynchronous mode in the SAP MI Server Component. Synchronous mode for synchronization is also available. The basic synchronization mechanisms are indistinguishable for both synchronous and asynchronous mode. Technically, the same messaging protocol is used for both modes. The variance lies in the timing for expecting response from the server. In the SAP MI Client Component, there is no application-specific coding that directly interacts with the synchronization process. Application-specific coding is only necessary when dealing with local data using the MI Client APIs. For application data that is stored locally in the persistence layer, the underlying components of the MI Client APIs keep the device data synchronized with the back-end. Error and conflict handling are exceptions. To handle synchronization errors using application-specific logics, Smart Synchronization offers features to access details error and conflict information.

2. SYSTEM ANALYSIS:

2.1. Existing System:

The existing system faces certain issues in algorithm like clock synchronization, event based, non-block synchronization and default synchronization algorithm which are discussed as follows.

Clock synchronization:

Clock synchronization is a hindrance from computer science and engineering which deals with the indication that internal clocks of several computers may vary. Even when primarily set precisely, real clocks will differ after some amount of time due to clock drift, caused by clocks counting time at slightly different rates. There are several hitches that occur as a consequence of rate variances and several solutions, some being more suitable than others in certain situations. In serial communication, some people use the term "clock synchronization" just to deliberate getting one metronome like clock signal to pulsation at the same frequency as another one frequency synchronization and phase synchronization. Such "clock synchronization" is used in synchronization in telecommunications and instinctive baud rate detection.
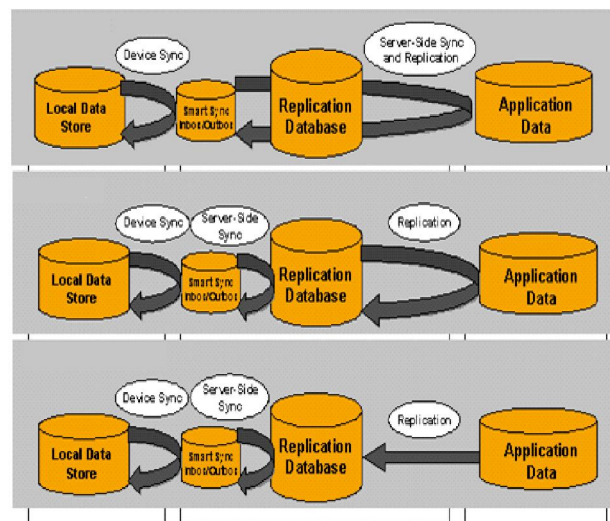

Fig: 1 Architecture of Smart Synchronization

Problems:

In addition to the erroneousness of the time itself, there are difficulties related with clock skew that take on more intricacy in a distributed system in which several computers will need to comprehend the same global time. For instance, in UNIX systems the make command is used to assemble new or revised code without the need to recompile unchanged code. The make command customs the clock of the machine it runs on to regulate which source files need to be recompiled. If the sources exist in on a separate file server and the two machines have unsynchronized clocks, the make program might not produce the correct results.

Event-based synchronization:

A synchronization method and apparatus describes event objects to permit synchronization of execution units (e.g., threads). In one procedure, the synchronization method and apparatus is used in aggregation with a UNIX operating system. By describing event objects on which threads or other execution objects can wait upon, multiple threads can

wait on one event, or otherwise, one thread can wait on multiple events. Besides, using the event-based synchronization method and device, it is conceivable to specify behavior, mainly when one thread or other execution object waits on multiple events. For example, the performance indicated can be that a condition is gratified if any of the events occur, if all of the events occur, or some other logical combination of events occurs.

Non-Block Synchronization Algorithm:

Java provides supports for additional atomic operations. This allows to develop algorithm which are non-blocking algorithm, e.g. which do not require synchronization, but are based on low-level atomic hardware primitives such as compare-and-swap (CAS). A compare-and-swap operation checks if the variable has a certain value and if it has this value it will perform this operation. Non-blocking algorithm are usually much faster than blocking algorithms as the synchronization of threads appears on a much finer level (hardware)

Default Synchronization Algorithm:

The default synchronization algorithm starts when an attention identifier (AID) key is pressed. An attention identifier (AID) key is any key that generates a presentation space update. Primarily, the state of the terminal is UNINITIALIZED. The procedure waits for a period of time for updates to the presentation space. User can modify the wait time in the Timeout field in the preferences window. The nonappearance wait time is 1200 milliseconds. If Timeout is set to 1200 milliseconds, and an update arises during the last 600 milliseconds, the process waits for an additional 600 milliseconds for extra updates. During this extra wait period, added update occurs during the last 300 milliseconds, the algorithm waits again for another 600 milliseconds for further updates. This continues until no updates are received during the last half of the last additional time period. At this point, the state of the terminal is either LOADED (keyboard locked) or READY (keyboard unlocked), reliant upon the OIA status. Thus to conclude the existing system faces few disputes like slow indexing, poor extensibility, flexibility, low synchronization, reliant on database vendors, less secured, high cost.

2.2 Proposed System:

To overwhelm the above hitches we have hosted the algorithm SAMD (Synchronization Algorithms based on Message Digest). SAMD resolves synchronization glitches using only standard SQL queries as trained by the ISO. This is monitored by a possible synchronization of any data combination irrespective of the kind of server-side database or mobile database. The SAMD thus would offer extensibility, compliance and flexibility. The SAMD makes the data's at the table of the server-side database and the mobile database using a message digest algorithm; then the data's, and the message digest values are saved in the message digest tables on both sides.

3. SYSTEM IMPLEMENTATION:

The Fig.2 represents a synchronization framework using a synchronization server in a mobile business environment. The whole framework consists of a server-side database, synchronization server (AnySyn) and multiple mobile devices with internal mobile databases. The server-side database maintains all of the data required for business, and the mobile database downloads copies of data the user needs from the server-side database. The synchronization server is located between the two databases to synchronize the data and manage additional information required for synchronization. The AnySyn synchronization server performs synchronization based on the SAMD algorithm. The synchronization policy is established in AnySyn, and the load caused by accessing the server-side database is minimized by operating a connection pool. Every mobile device uses a separate toolkit to access the AnySyn server over a wired network to perform synchronization.
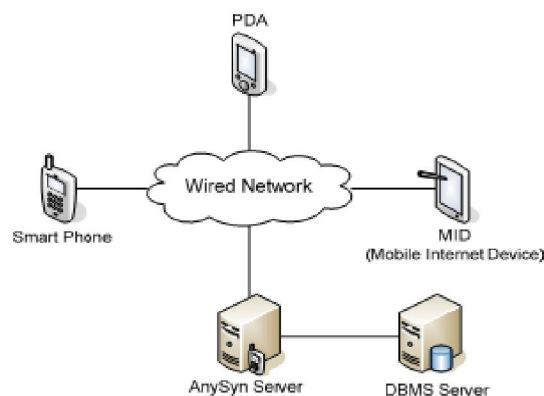

Fig .2 SAMD Synchronization Framework

Row Inconsistency:

An inconsistency refers to a state in which the published data in the server-side database and the subscribed data in the mobile database carry different values due to a change at either side. The two databases add, delete and modify data independently, which makes inconsistency inevitable. The Table.1 displays every case for an inconsistency for a single row.

Among the 16 cases indicated in Table.1, Cases 6, 7, 8, 10 and 14 include the ADD operation, which cannot occur for a single row. For example, in Case 7 the row added at the server side is different from the row modified at the client; therefore, it cannot be

considered an inconsistency. Case 7 is equivalent to Case 3 and Case 5 occurring independently. Similar reasoning can be made for Cases 6, 8, 10 and 14, so SAMD does not consider the five cases.

C	Mobile DB	DB Server	C	Mobile DB	DB Server	C	Mobile DB	DB Server	C	Mobile DB	DB Server
1	UC	UC	5	UC	ADD	9	UC	MOD	13	UC	DEL
2	ADD	UC	6	ADD	ADD	10	ADD	MOD	14	ADD	DEL
3	MOD	UC	7	MOD	ADD	11	MOD	MOD	15	MOD	DEL
4	DEL	UC	8	DEL	ADD	12	DEL	MOD	16	DEL	DEL

(C:Case, UC:Unchanged, ADD:Added, MOD:Modified, DEL:Deleted)

Table 1: Inconsistency Table
(Source: Mi-Young Choi et.al)

Message Digest Algorithm:
 Message digest algorithm consists of a unidirectional hash function that maps a message of a random length to a fixed-length hash value. Message digest h is created by the hash function H, which can be expressed in equation (1):

$$h = H(M) \rightarrow (1)$$

 M is a message of a random length and H(M) is a fixed-length message digest. Even a single bit changed in the message causes a change of message digest value.
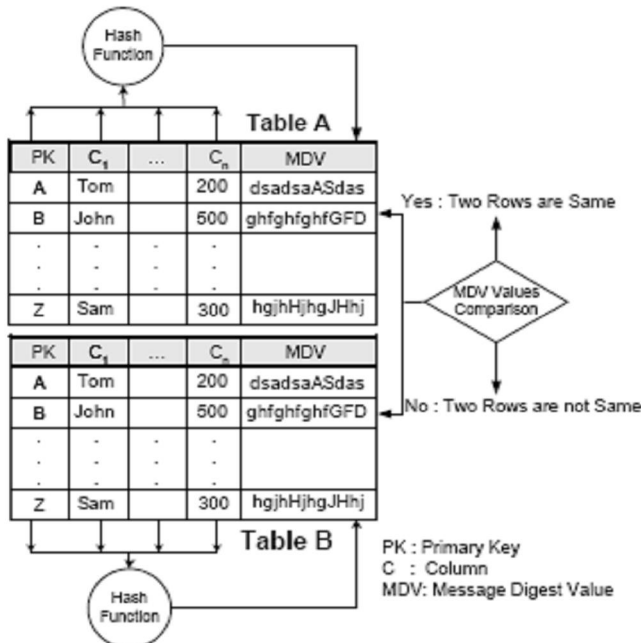
Fig. 3. Message Digest Mechanism
(Source: Mi-Young Choi et.al)

The Fig. 3 demonstrates how this message digest mechanism can be applied to a relational database to examine data identity between rows of two tables. Data in two rows are identical if two rows in Tables A and B have identical message digest values. If the two values are different, it means that the two rows have one or more different column values. Accordingly, this method can be useful in detecting inconsistency between two rows once a row with an inconsistency is detected; the row is copied using the primary key in the direction of synchronization according to the synchronization policy. This synchronization algorithm identifies a modified row without relying on the database's internal functions, logs or metadata to enable synchronization that is independent of the database vender.
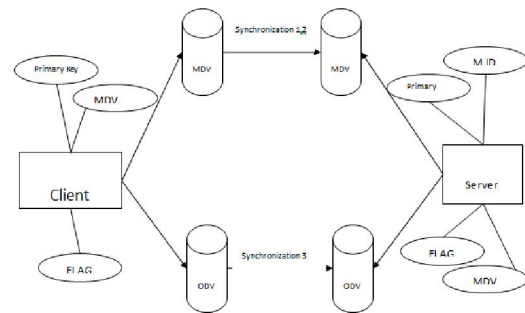

Fig. 4 Algorithm Design

SAMD synchronization algorithm satisfies the following objectives.
 1) Independence of vendors.
 2) Synchronization using only standard SQL statements.
 3) Disallows schematic modification of data table of the server-side database.
 4) Disallows adding restrictions in implementing applications.

5. SAMD Algorithm Explanation:
 SAMD Synchronization Algorithm displays (Fig.4) the table schema of the server-side database and the mobile database where the SAMD synchronization algorithm is applied. Both databases have a data table (DSDT: Database Server Data Table, MCDT: Mobile Client Data Table) and a message digest table (DSMDT: Database Server Message Digest Table, MCMDT: Mobile Client Message Digest Table). The data table contains the business data, and the message digest table stores the message digest value from the data table. The message digest table consists of a PK column of data table, message digest value (MDV) column, flag (F) column and mobile device ID (Mid) column. The flag column signals an inconsistency that has occurred in

the corresponding column; therefore, the flag column is used to identify a row that requires synchronization. The mobile device ID is a unique number of the mobile device, so this column is used to identify a mobile device that requires synchronization. In SAMD Synchronization Algorithm, if a row's PK value is A1, this value is identical to the two message digest values and there is no need for synchronization. However, if a row has a PK value of C1, the value of MDV in MCMDT is different from the value of MDV in DSMDT and the MCMDT flag value is 1.

Consequently, synchronization is necessary. The synchronization process is performed for each row to resolve all of the inconsistencies mentioned. For instance, if there is a discrepancy in row C1, synchronization proceeds from the mobile database to the server-side database and DSDT's PK C1 row is swapped with the MCDT's C1 row. Thus, the two are same synchronization algorithms applied to diverse tables. Here, the message digest values that are created with each row value of the data table, and the message digest values of the message digest table, are associated. If the values are alike, there has been no modification in the data and synchronization is not required. If the values are different, it means that the data table value has been changed, in which case the message digest table has to be updated with new message digest values and the flag has to be set to 1. Flag value is used to identify a row that needs synchronization. The server-side database has one DSMDT for every DSDT. Although the size of the MCMDT is smaller than that of the DSMDT, there is an MCMDT for every mobile device that has a unique ID. It is very inefficient to perform Synchronization 2 for every row of the DSDT every time there is a synchronization request from a mobile device. Therefore when the mobile device requests synchronization, the mobile device ID value is sent to the server-side database and then the SAMD algorithms select the row from DSMDT whose value of mid column is the same as the mobile device ID value and Synchronization 2 is only applied to the selected rows. For example, a mobile device whose mobile device ID value is 'md1' requests synchronization, the rows whose value of mid column is 'md1' are selected and then only used in Synchronization 2. After SAMD algorithms analyze the type of inconsistency using the flag values of both messages digest tables, primary key, which is used to identify the row. Therefore, Synchronization 3 is performed between two data tables for each inconsistent type. Upon completion of synchronization, the flag of the synchronized row is set to 0 in the message digest table. Most mobile devices have limited resources, and the load on the device should be minimized during the synchronization process.

Accordingly, all message digest tables are located in the server-side database to economize storage space of the mobile device, as shown in Fig., while there is the load caused by accessing the network in Synchronization 1 but the data size of MCDT is smaller than the server. Furthermore, the MCDT data necessary for Synchronization 1 is sent to the server-side database in a single transmission over a wired network using an SQL query capable of batch processing. After this point, there is no load on the mobile device, which reduces the load caused by network access in the Synchronization 1 stage. The following snap shots explain in detail about the process undergone and the output obtained in each synchronization stages.
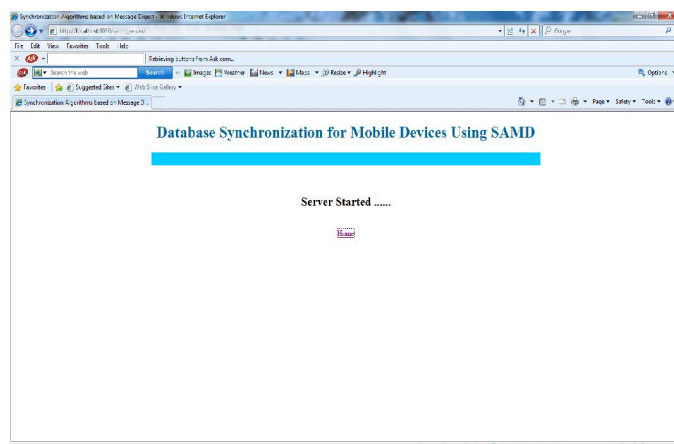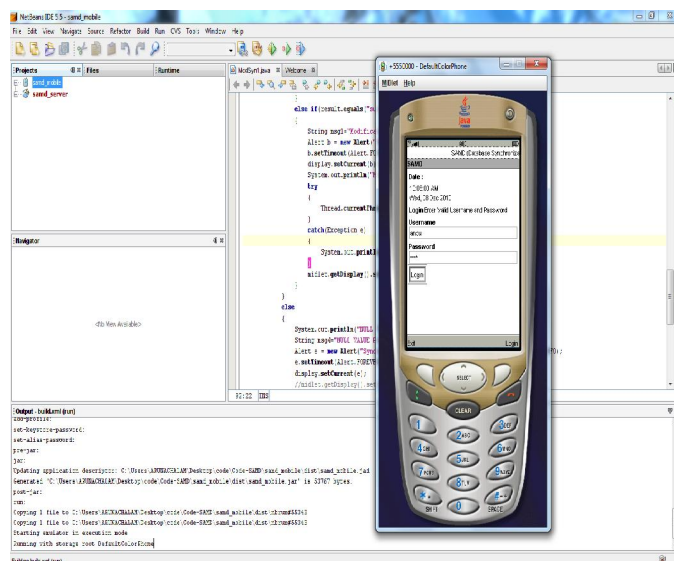

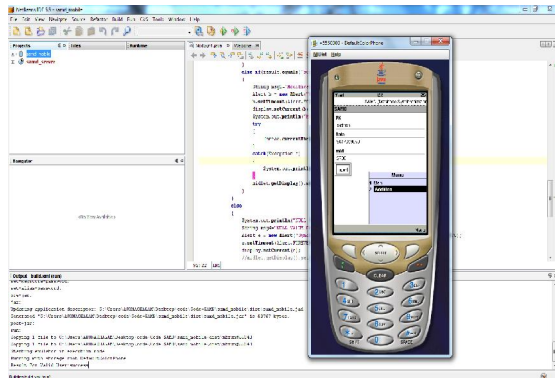Fig. 6.SAMD and Server Starting Page

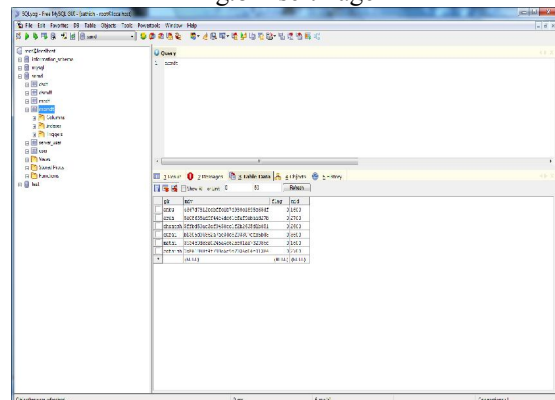
Fig.7 Login Page

Fig.8 Insert Page
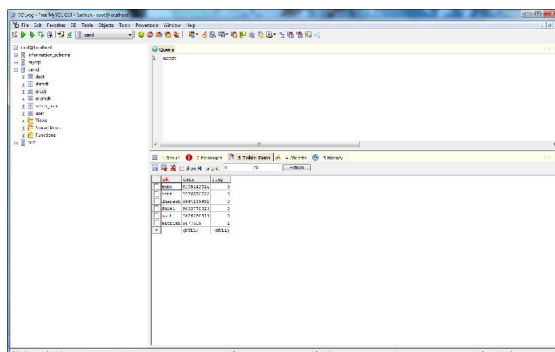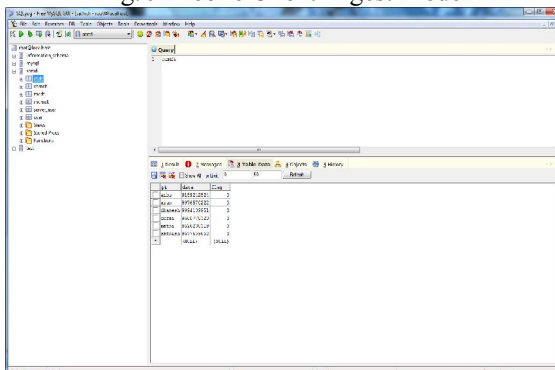

Fig. 9 Mobile Client Digest Model

Fig. 10 Comparison of Database Server Message Digest Table and Mobile Client Message Digest Table
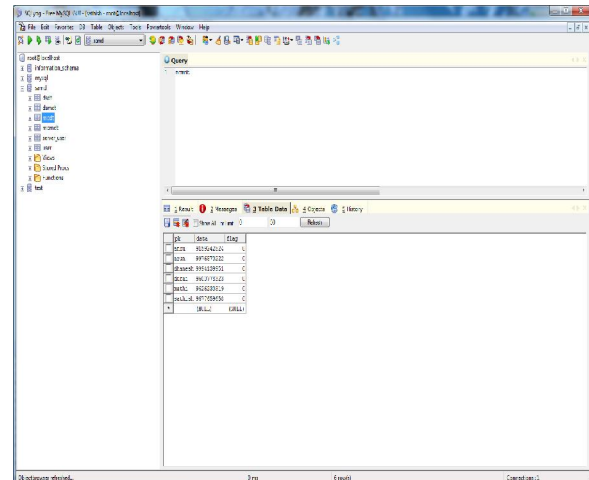

Fig. 11 Mobile Client Message Digest Table after Modification

CONCLUSION:

This work suggests an SAMD synchronization algorithm based on message digest for synchronizing between server-side databases and mobile databases. The SAMD algorithm is performed with only SQL functions of relational databases, so that it is not dedicated to particular vendors and is available for use in combination with any server-side databases and mobile databases. Therefore, extensibility, compliance and flexibility are assured when a mobile business system is ratified. This feature is vital in order to build effective mobile business systems since the upcoming mobile business situation has varied features in which diverse mobile devices, mobile databases and RDBMS exist.

FUTURE ENHANCEMENTS:

The work can be enhanced by integration of heterogeneous application to mobile devices. The system can use more volatile and robust Dynamic database storage improvement in mobile clients. The system can be further established for simultaneous and multiple applications processing.

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