

Impact of Health Educational Program on Menstrual Beliefs and Practices of Adolescent Egyptian Girls at Secondary Technical Nursing School.

Reem Bassiouny El-Lassy and Abeer Abd El-Aziz Madian

Community Health Nursing Department, Faculty of Nursing, Damanhour University
reembass@yahoo.com abmadian@hotmail.com

Abstract: Background: Menstruation and menstrual practices are still clouded by socio-cultural restrictions resulting in adolescent girls remaining ignorant of the scientific facts and hygienic health practices, which sometimes result into adverse health outcomes. **Aim of study:** is to assess the impact of health educational program on menstrual beliefs and practices of adolescent girls at secondary technical nursing school. **Material and Methods:** Interventional study was conducted on 97 adolescents at secondary technical nursing school of Damanhour City, El-Behara Governorate, Egypt. A designed questionnaire was administered and later health education regarding menstruation and healthy menstrual practices was imparted to girls. Post-test was done after 3 months to assess the impact of the program. **Results:** It was observed that 41.2% gained their knowledge from their friends. Menstrual practices among them was found to be fair before the program, while in the post-test, there were a significant differences in student's level of knowledge and practices. There was a negative correlation between mothers' education and students' practices. **Conclusion and Recommendations:** The level of students' knowledge regarding menstruation and menstrual hygiene practices improved after the program. Therefore, it is recommended to implement health educational programs about menstrual hygiene to preparatory and secondary school students to improve their menstrual knowledge, beliefs and practices.

[Reem Bassiouny El-Lassy and Abeer Abd El-Aziz Madian. **Impact of Health Educational Program on Menstrual Beliefs and Practices of Adolescent Egyptian Girls at Secondary Technical Nursing School**]. *Life Sci. J.* 2013; 10(2):335-345]. (ISSN: 1097-8135). <http://www.lifesciencesite.com>.52

Key Words: Menstrual education program, menstrual knowledge and practices, menstrual hygiene.

1. Introduction

Adolescence is the period of transition from childhood to adulthood. WHO defined adolescence as the age group of 10-19 years. In girls, adolescence is recognized as a turbulent period which signifies the transition from girlhood to womanhood. The onset of menstruation is one of the most important features of adolescence in girls. A woman goes through several developmental milestones that greatly influence her reproductive health. Menarche, which is the establishment of menstruation, is one of these milestones and a natural phenomenon unique to females.⁽¹⁾

Moreover, Menarche, is a landmark feature of female puberty and signals reproductive maturity.⁽²⁾ Menstruation is the cyclical shedding of the inner lining of the uterus, the endometrium, under the control of hormones of the hypothalamopituitary axis. The first menstruation (menarche) occurs between 11 and 15 years with a mean age of 13 years. There are several traditions, myths, misconceptions, mystery and superstition prevailing about menstruation.⁽³⁾

Majority of the girls lack scientific knowledge about menstruation and puberty. Adolescent girls often are reluctant to discuss this topic with their parents and often hesitate to seek help regarding

their menstrual problems. The profile of the woman's reproductive health is greatly influenced by the girl's reaction to menarche, her beliefs and attitude towards menstruation, and more important her behavior during it.⁽⁴⁾ Girls need emotional support and assurance that menstruation is normal and healthy, not bad, frightening or embarrassing. The practices of menstrual hygiene and subjective experience of menstruation should be stressed.⁽⁵⁾

Up until now, poor menstrual hygiene in developing countries has been an insufficiently acknowledged problem. In several cultures there are (cultural and or religious) taboos concerning blood, menstruating girls and women and menstrual hygiene.⁽⁶⁾ The lack of attention to this issue is striking. Approximately 50% of the world's population knows from their own experience how important good menstrual hygiene is to be able to function optimally during the menstruation period.⁽⁷⁾

Young girl may be discouraged from somatic, outdoor activities, discontinue bathing, and she may be encouraged to stay at home for a day from school. In addition, many young women have a mindset of avoidance that has to do with an association of water or environmental conditions, especially cold. They believe that cold can stop menstrual flow. According to the ancient hot/cold theory, blood was seen as hot and dry and is

opposed by anything cold or wet, including certain foods, herbs and medicines. ⁽⁸⁾

Unhygienic menstrual practices may affect their health such as increased vulnerability to RTIs (Reproductive Tract Infections) and PIDs (Pelvic Inflammatory Diseases) and other complications. Use of sanitary pads may be increasing but not among girls from rural and poor families. ^(9, 10) Girls should be educated about “menstruation and healthy menstrual practices” through expanded program of health education in schools. Yet the small girl must keep clean, tidy, in good condition, and practice all daily activities. During the menstrual period, sanitary napkins should be changed about every 4 hours, possibly more often during the first days of the period when the menstrual flow is usually heavier. Changing menstrual pads before permitting leakage virtually prevents unpleasant odor. A warm bath should, if possible, be taken daily throughout the period. ^(11, 12)

Menstrual education is a vital aspect of health education. It is known that attitudes to menstruation and menstrual practices developed at menarche may persist throughout life. The study of the menstrual practices of adolescent girls unveils health issues that affect their adjustment to reproductive life. Before planning for health education programs about menstruation, a study of adolescents' knowledge of menstruation, and their beliefs and practices will help the health educator, maternity nurse, school nurse, and community nurse discover deficiencies in their knowledge and troubling misconception-related issues. ^(13, 14)

There is a limited research examining changes in knowledge, beliefs and practices of El-Behara Governorate students following implementation of menstrual education program (MEP). Therefore; **the intent of the present study** is to assess the impact of health educational program on menstrual beliefs and practices among adolescent girls.

Hypothesis of this interventional study was:

Menstrual educational program will have positive or negative impact on beliefs and practices of adolescent girls at secondary technical nursing school.

2. Material and Methods

Study design:

Quasi-experimental pre-post test design was conducted to all students.

Study setting:

This study was carried out in the secondary technical nursing school in Damanhour City, which is the only one there (the headmistress of the school urgently asked for improves girls' knowledge and practices regarding menstrual hygiene).

Subjects:

All girls enrolled in the secondary technical nursing school in Damanhour City (N= 97) were included in the study.

Tool for data collection:

One tool was developed and used by the researchers in order to collect the necessary information from students after reviewing the literatures.

This tool includes:

Part I: Students' personal data:

- **Socio-demographic characteristics:** as age, grade, birth order, mother's education and occupation, father's education and occupation.
- **Menstrual history:** as age of menarche, frequency, regularity of menstruation, intervals, associated pre-menstrual symptoms and complains.
- **Sources of information about menstrual hygiene.**

Part II:

-Students' knowledge about menstruation and menstrual hygiene as definition of menstruation, age of menarche, signs and symptoms associated with menstruation.

Part III:

- Students' menstrual hygienic beliefs as girls' beliefs related to drinking or eating hot/cold food during menstruation, and if women may have or haven't menstruation during pregnancy.

Part IX:

-It includes items about students 'hygienic practices, behaviors and restrictions during menstruation.

Methods

- ☒ Permission to conduct the study was obtained from the school headmistress. The secondary technical nursing school in Damanhour City was visited by two data collectors.
- ☒ All students enrolled in the school (3 classes) were included in the study; their total numbers were 97 students and accepted to participate in the study after being oriented about the purpose of it.
- ☒ Tool of data collection was designed based on recent relevant literature and was administered to the school girls to study their existing level of knowledge, beliefs and practices regarding menstruation.
- ☒ Tool was tested for contents validity from jury consist of 3 experts in community Health Nursing at Alexandria, and Damanhour University.

- ☒ After the development of the tool, a pilot study was carried out on 10 students randomly selected from another secondary technical nursing school at El-Behara Governorate (El-Mahmoudia).
- ☒ Menstrual educational program was designed based on relevant literature and student's needs.
- ☒ Menstrual educational program was implemented in one month.
- ☒ Finally, students were assessed to determine the effect of menstrual educational program on their knowledge, beliefs and practices.
- ☒ Data collection: Data was collected during the academic years November 2011 – April 2012.

Intervention phase:

-Selection of the place:

The educational sessions were held at classes of secondary technical nursing school at Damanhour City.

-Selection of participants

All students enrolled in the school, they were divided into smaller groups; each group (15 students) attended 2 sessions/week. The duration of each session was ranged between 30-45 minutes, started with 5 minutes for establishing relationships with participants, then 20 minutes lecture and followed by group discussion for 10-20 minutes questions and answers.

-Menstrual educational program (MEP):

The objectives of menstrual educational program were to encourage voluntary changes in behavior favorable to health. This improvement in behavior could be attained by improving knowledge and beliefs.

Methods of teaching: Lecture and group discussion were used. Visual aids in the form of posters and handouts were used.

Content of the program:

1. General information about definition of menstruation, age of menarche, menstrual cycle, duration of menstruation and problems associated with menstruation.
2. Causes of pain, abnormal menstruation, what to do to relieve pain, washing during menses, type of pads, frequency of change, perineal hygiene, underwear and methods of cleaning.
3. Exercises during menses, dangerous behaviors during menses.
4. Pain relievers, aspirin use, when to contact doctor, healthy practice to relieve pain.
5. Correction of misconceptions regarding menstruation.

Evaluation phase:

The same questionnaire of menstrual hygiene introduced for students three months after the end

of the intervention program to evaluate the impact of the program on knowledge, beliefs and practices of students.

Scoring system

A) Scoring system for assessing the student's knowledge regarding menstruation;

This section consists of 6 items and the correct answers were pre-determined according to the literature. A score of (2) was given to the correct complete answer, a score of (1) for correct but incomplete answer and a score of (0) for the wrong or missed answers. The total knowledge score was obtained for each student (0-12). Percent of the total knowledge score was calculated as follows;

- Poor knowledge <6 (<50%)
- Satisfactory 6 - <9 (50 - <75%)
- Good ≥ 9 ($\geq 75\%$)

B) Scoring system for assessing the student's practices regarding menstruation;

This section of the questionnaire consists of 8 items assessing girls' practices of menstrual hygiene. A score of (3) was given to good hygienic practice, a score of (2) was given to fair practices and a score of (0) was given to poor practice.

The maximum score was ranged from (0-24 points). Percent of total behavior score was categorized as follows;

- Poor practice < 12 (<50%)
- Satisfactory practice 12- < 18 (50 - <75%)
- Good practice ≥ 18 ($\geq 75\%$)

Statistical analysis:

- 1- The collected data was processed and analyzed using SPSS program, version 16. Data were revised, coded and tabulated using the number and percentage for categorized data and mean with standard deviation for scale data.
- 2- Statistical significance level was set at 5% ($p \leq 0.05$).
- 3- Paired t-test was used to compare between sample means for quantitative data with normal distribution (pre-post).
- 4- Correlation coefficient (r_s) was used to test correlation between two quantitative variables not normally distributed.
- 5- McNemar test (matched analysis) was used to assess significance between two correlated proportions.

3. Results

Regarding characteristics of the studied sample, their mean age was 17.25 ± 0.76 their ages ranged from 16-19 years and enrolled in 1st, 2nd, 3rd grades. More than one third of the students, (39.2%) were the first child in their family.

Concerning mothers' education and occupation, more than half of mothers (54.6%) had secondary education and the majority of them were housewife.

Table (1): Distribution of the studied sample according to their socio-demographic characteristics.

Socio –demographic characteristics	No (97)	%
Age		
16-	14	14.4
17-	50	51.5
18-	28	28.9
19+	5	5.2
Min. – Max.	16.0 – 19.0	
Mean ± SD	17.25 ± 0.76	
Grade		
1 st	15	15.5
2 nd	52	53.6
3 rd	30	30.9
Birth order		
1 st	38	39.2
2 – 4	55	56.7
≥5	4	4.1
Mother's education		
Illiterate & Primary education	35	36.1
Secondary education	53	54.6
University education	9	9.3
Mother's occupation		
Working	20	20.6
Housewife	77	79.4
Father's education		
Illiterate & Primary education	17	17.5
Secondary education	67	69.1
University education	13	13.4
Father's occupation		
Working	86	88.7
Not working	11	11.3

Table 2 reveals that, the students' mean age of menarche was 12.77 ± 1.34 years and more than two thirds (67%) of them reported that they were aware about occurrence of menarche. More than half of them (53.8%) reported by their elder sisters, followed by social workers in their school 21.5%. Regarding their menstrual regularity, more than two thirds of them had regular menstruation and their menstrual intervals was 21 to less than 35 days and 19.6% for those girls reported less than 21 days. The duration of menstrual flow was from 3-6 days as mentioned by more than three quarters of sample, while more than 7 days reported by 18.6% of girls and only 3% of girls mention that their menstrual flow was less than 3 days. Almost, all sample (85.6%) reported that they had pre-menstrual discomfort as dysmenorrheal pain, fatigue, acne and nervousness.

It was mentioned by the studied sample that more than half of them complaints of dysmenorrheal pain and backache during their menstrual period.

Figure (1) presents girls' current sources of knowledge regarding menstrual hygiene. Less than half of the studied sample (41.2%) acquired their knowledge from friends, 30.9% from mass-media as T.V., internet and magazines, followed by mothers and grandmothers were 18.6% and finally school staff nurse, doctors, social workers as reported by 9.3% of girls.

Table (2): Distribution of the studied sample according to their menstrual history

Menstrual history (no.=97)	No	%
Age of menarche		
Min. – Max.	9.0 – 16.0	
Mean ± SD	12.77 ± 1.34	
Preparation for the occurrence of menarche	N=97	
Yes	65	67.0
No	32	33.0
Sources of information about preparation for the occurrence of menarche N=65		
Mother and grandmother	10	15.5
Elder sister	35	53.8
Teacher	6	9.2
Social worker	14	21.5
Regularity of menstruation	N=97	
Regular	65	67.0
Irregular	32	33.0
Intervals between each menstruation		
< 21 days	19	19.6
21 –	67	69.1
≥ 35 days	11	11.3
Duration of menstruation		
<3 days	3	3.0
3 – 6 days	76	78.4
≥7 days	18	18.6
Associated pre-menstrual symptoms		
Absent	14	14.4
Present ** (no.=83)	83	85.6
Anxiety	26	26.8
Nervousness	32	33.0
Fatigue	43	44.3
Insomnia	22	22.7
Headache	24	24.7
Dysmenorrheal pain	55	56.7
Muscles cramps	25	25.8
Breast discomfort (pain, tenderness, heaviness)	31	32.0
Acne	43	44.3
Complains during menstruation **	N=97	
Increased appetite	7	7.2
Anorexia	25	25.8
Vomiting	24	24.7
Hypothermia	17	17.5
Fatigue	42	43.3
Dysmenorrheal pain	58	59.8
Backache	54	55.7

****Not mutually exclusive**

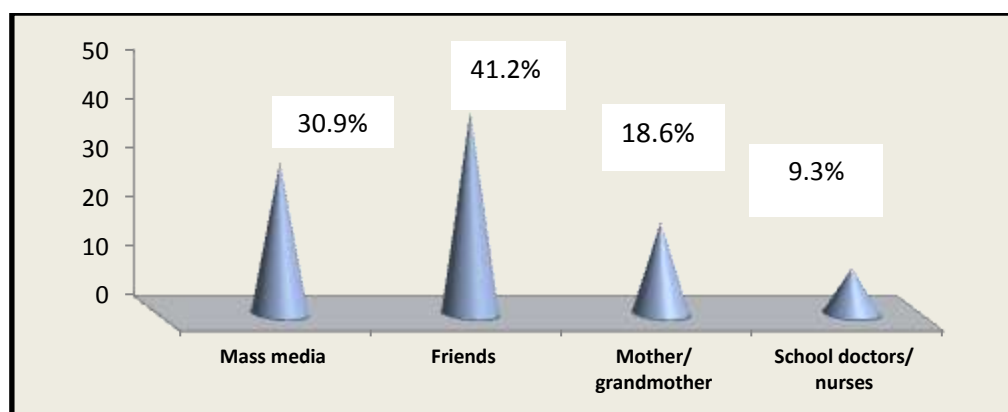


Figure (1): Distribution of the studied sample according to their sources of information about menstrual hygiene.

Table 3 portrays the impact of menstrual education program on total score of menstrual knowledge of the adolescent girls. It was observed that the mean knowledge scores of studied sample were significantly higher at the post intervention phase (86.68 ± 7.95) than that of the pre-intervention (53.18 ± 15.04), ($t=20.564$, $p<0.001$), ($X^2_{mc}=6.8$, $p=0.000$).

Table (3): Impact of Menstrual Education Program on total knowledge score of Secondary School Egyptian Girls.

Total knowledge score	Pre intervention N=97		Post intervention N=97	
	No	%	No	%
Knowledge				
Poor knowledge (<50 %)	26	26.8	0	0.0
Satisfactory (50 - <75%)	44	45.4	4	4.2
Good ($\geq 75\%$)	27	27.8	93	95.8
X^2_{mc} (P)	6.8 (0.000)*			
Min. - Max.	16.67 - 83.33		58.33 - 100.0	
Mean \pm SD	53.18 \pm 15.04		86.68 \pm 7.95	
t (p)	20.564* (<0.001)			

X^2_{mc} : Mc-Nemar test for related groups

t: for Paired t-test *: Statistically significant at $p \leq 0.05$

Table 4 shows the students' beliefs regarding menstruation. In the pre intervention phase, 93.8% of girls felt that menstrual blood is impure. However, in the post-intervention phase, there was a surprising significant change in their beliefs about if menstrual blood is impure or not ($X^2_{mc}=12.4$, $p<0.000$). In addition, it was observed that the majority of the studied sample at the pre-test phase belief that excessive bleeding during menstruation lead to anemia and they increasingly in the post-test. There was a significant difference between the pre-intervention phase and post intervention phase, ($X^2_{mc}=3.9$, $p<0.050$).

Table (4): Impact of menstrual education program on students' menstrual beliefs.

Beliefs regarding menstruation	Pre intervention N=97		Post intervention N=97		X^2_{mc} (P)
	No	%	No	%	
Menstrual blood is impure					
Wrong belief	91	93.8	3	3.1	12.4 (0.000)*
Correct	6	6.2	94	96.9	
Hot/cold food influence the menstrual flow					
Wrong belief	23	23.7	14	14.4	3.7 (0.075)
Correct	74	76.3	83	85.6	
Excessive bleeding lead to anemia					
Wrong belief	19	19.6	6	6.2	3.9 (0.050)*
Correct	78	80.4	91	93.8	
Woman have menses during pregnancy					
Wrong belief	5	5.2	2	2.1	1.4 (0.608)
Correct	92	94.8	95	97.9	

X^2_{mc} : Mc-Nemar test for related groups

*: Statistically significant at $p \leq 0.05$

Regarding students' menstrual practices, **Table 5** points out that the mean total score of practice for students at the post-intervention phase were significantly higher than that of pre-intervention phase, (79.64 ± 8.77 and 57.43 ± 17.51 respectively), ($t=10.643$, $p<0.001$), ($X^2_{mc}=7.4$, $p=0.004$). The table also illustrates that only 3.1% of the studied sample has changed their pads more than 4 times/day at pre-intervention phase. Meanwhile, this percentage was changed to be 54.6% after education program. It was obviously that adolescent girls become more aware about the usage of sanitary pads as mentioned by the majority of the sample and warping it at plastic bags.

At the pre-intervention phase, 16.5% of the studied sample thrown sanitary pads on road-side. While, about three quarters (74.2%) of girls mentioned that they displace or dispose sanitary pads at house-dustbin compared to all of them at the post intervention phase. It was surprising that water was the mean used for washing their underwear clothes by more than half of the girls at the pre-intervention phase compared to 84.5% of those girls using soap and water at the post intervention phase.

On one hand, more than half of the participants mentioned that they go to school and practice routine activities at the first day of their menstruation at pre-intervention phase and this was increasing to be more than three quarters after education program. On the other hand, those complaints of dysmenorrheal pain reported using multiple measures to relieve their symptoms: 48.3% for medications, 24.1% for rest, 12.1% for herbal drinks/Tea, 10.3% for practicing exercise and 5.2% for using heating pad at pre-intervention phase. These were changed to be 17.2%, 13.8%, 10.3%, 46.6% and 12.1% respectively at the post intervention phase.

Table (5): Impact of menstrual education program on students 'menstrual practices

Menstrual practice of the studied sample	Pre intervention N=97		Post intervention N=97	
	No	%	No	%
Number of pads / day				
Twice/ day	55	56.7	14	14.4
3 times/day	39	40.2	28	28.9
4 times/day	3	3.1	53	54.6
5 times/ day	0	0.0	2	2.1
Type of pads used				
Piece of clothes	8	8.2	2	2.1
Piece of cotton or surgical dressing	5	5.2	2	2.1
Sanitary pad	84	86.6	93	95.8
Washing clothes				
Soap and water	42	43.3	82	84.5
Only water	55	56.7	15	15.5
Types of pads' warp used for disposing it				
Papers	11	11.3	18	18.6
Plastic bag	70	72.2	78	80.4
Not warp	16	16.5	1	1.0
Methods of displace/dispose sanitary pads				
House-dustbin	72	74.2	97	100.0
Thrown on road-side	16	16.5	0	0.0
Latrine	9	9.3	0	0.0
Number of changing panty/day				
≤ Twice/ day	87	89.7	13	13.4
3-4 times/day	9	9.3	83	85.6
5 times/day	1	1.0	1	1.0

Table (5) Cont.: Impact of menstrual education program on students 'menstrual practices

Menstrual practice of the studied sample	Pre intervention N=97		Post intervention N=97	
	No	%	No	%
Student's act/behave in first day of menstrual				
Stay at home	39	40.2	24	24.7
Go to school and practice Daily living activities	58	59.8	73	75.3
Measures used by adolescent girl students to alleviate symptoms of dysmenorrheal pain (n.=58)				
Medications	28	48.3	10	17.2
Rest	14	24.1	8	13.8
Herbal drink/ Tea	7	12.1	6	10.3
Heating pad	3	5.2	7	12.1
Exercise	6	10.3	27	46.6
Total practice scores				
Poor practice (<50%)	21	21.6	1	1.0
Satisfactory practice (50% -)	62	63.9	21	21.6
Good practice (≥75%)	14	14.4	75	77.3
$\chi^2_{mc} (P)$	7.4 (0.004)*			
Min. – Max.	8.33 – 91.67		41.67 – 91.67	
Mean ± SD	57.43 ± 17.51		79.64 ± 8.77	
t (p)	(10.643) * <0.001			

p: value for Paired t-test Statistically significant at $p \leq 0.001$ χ^2_{mc} -test for related groups*Statistically significant at $p \leq 0.05$

A finding in table 6 shows the menstrual behaviors and various restrictions followed by the girls during menstruation. In the pre-intervention phase, 87.6% of girls reported that they don't visit the holy places during menstruation and 39.2% of girls reported that they isolate themselves at home during menses. In the post intervention phase, significant difference was seen with regard to visiting the holy places during menstruation, ($\chi^2_{mc}=19.7, p < 0.001$). In the post intervention phase, significant increase was seen regarding performing their normal daily living activities than pre-intervention ($\chi^2_{mc}=6.7, p < 0.010$). Only 23.7% of girls reported that when they were menstruated, they wash their genitalia with soap and water whenever they change their cloths/sanitary pads. Whereas in the post intervention period, significant improvement was observed in their menstrual practice ($\chi^2_{mc}=14.5, p < 0.000$).

Table (6): Impact of menstrual education program on student's menstrual behaviors and restrictions

Restriction during menstruation	Pre intervention N=97		Post intervention N=97		χ^2_{mc} (P)
	No	%	No	%	
Visit the holy places during menses					
No	85	87.6	19	19.6	19.7 (0.001)*
Yes	12	12.4	78	80.4	

Table (6) Cont.: Impact of menstrual education program on student's menstrual behaviors and restrictions

Restriction during menstruation	Pre intervention N=97		Post intervention N=97		X^2_{mc} (P)
	No	%	No	%	
Visit relatives, friends, and neighbors					4.8 (0.022)*
No	12	12.4	4	4.1	
Yes	85	87.6	93	95.9	
Doing daily living activities					6.7 (0.010)*
No	25	25.8	6	6.2	
Yes	72	74.2	91	93.8	
Isolate herself					2.8 (0.392)
No	59	60.8	69	71.1	
Yes	38	39.2	28	28.9	
Take daily bath					13.9 (0.000)*
No	86	88.7	3	3.1	
Yes	11	11.3	94	96.9	
Wash genitalia with soap and water whenever change pad					14.5 (0.000)*
No	74	76.3	2	2.1	
Yes	23	23.7	95	97.9	

 X^2_{mc} : test for related groups*Statistically significant at $p \leq 0.05$

Table 7 shows the reaction given by the respondents on seeing the advertisement of sanitary pads on television. More than three quarters (79.4%) of girls reported that they felt shy or embarrassed to see the advertisements in front of male members of the family, while 3.1% of girls reported that such advertisement should be banned and 17.5% had no reaction.

Table (7): Distribution of the studied sample according to their reactions towards sanitary pad advertisements on T.V.

Reactions of girls towards sanitary pad advertisement on T.V	No (97)	%
Feel shy/embarrassed in front of male members of the family	77	79.4
Such advertisements should be banned	3	3.1
No reaction	17	17.5

Table (8) revealed that, there was no significant difference observed between students' birth order and their knowledge and practices. However, there was a negative correlation between mothers' education and students' practices, ($r_s = -0.114$).

Table (8): Correlation between girls' practices, knowledge with their birth order and mother's education

	Practice		Knowledge	
	r_s	p	r_s	p
Birth order	0.037	0.715	0.141	0.167
Mother's education	-0.114	0.269	0.013	0.902

 r_s : Correlation coefficient

4. Discussion

One important but under-addressed right for every woman is having a safe, personal and cultural environment to manage menstruation hygienically and with dignity. However, the ability to enjoy this right is often far from reality. One reason for this is that menstrual hygiene management is often neglected in general health agendas.⁽¹⁵⁾

Whereas, menstruation is a normal physiologic process; girls need not restrict their usual daily routine work, social and athletic activities in any way during their period. Indigenous practices of some girls prior to menstruation will influence their behavior toward it. They usually share whatever local customs and beliefs their parents practice. Some traditional practices are useful, while some are harmful and some are harmless. Every girl should be prepared for her first menstruation as it is preceded with the general development and changes.⁽¹⁶⁾

In the present study, the mean age of students' adolescent girls was 17.25 ± 0.76 years whereas the study conducted in technical nursing school in Damanshour City, the mean age of menarche was found to be 12.77 ± 1.34 years. This result is in accordance with findings from other studies.^(7, 17) In a study done in El-Mansoura City, Egypt 2004 the mean age of menarche was 12.9 years.⁽¹⁸⁾ While in Alexandria 2004, it was 11.9 ± 0.93 .⁽¹⁹⁾ But in a study among Jordanian girls 2004⁽²⁰⁾ the mean age was 13.8 years. This difference could be attributed to the influence of heredity, environmental influence and nutrition. The present study shows that 67% of the girls were well prepared and aware about menarche. Ideally, all mothers should make their daughters aware of menarche even before they attain it.^(2, 17)

Although, half of the girls their mothers were completed secondary school education and more than three quarters of them were housewife, a negative correlation was found between mother's education and their daughters' menstrual practices. This may be attributed to lack of mother's time to give her daughters a good model of practices which affect her behavior.

Moreover, the elder sister was found to be the main source of information about the occurrence of menarche for 53.8% of girls, followed by social workers in their schools. This could be due to lack of proper communication between mother and their daughters owing to traditional taboos, they feel awkward and embarrassed to discuss on this subject. This result is congruent with study conducted in India 2007⁽²¹⁾, which stated that 22.4% of adolescent girls got information from elder sisters. Alternatively, this result is contradictory with study conducted by Gilany in Egypt 2005⁽²²⁾ among urban girls; who reported that, mass media was the main source of information on menarche followed by mother. This may be attributed to difference between urban and rural communities.

About 30.9% of the students had experienced abnormal menstrual cycle intervals (<21 days or >35 days) which is a common phenomenon in the first two years after menarche, this is because hormonal change is common at this time. Other causes of menstrual irregularity like endocrine disorders, tumors and acquired disorders like stress.⁽²³⁾ This is harmonious with finding of the study done in Ethiopia (2009)⁽²⁴⁾ that revealed same percent (30.9%).

The present study showed that, most of students reported premenstrual symptoms as dysmenorrheal pain, acne, fatigue and breast discomfort, this result is similar to study done in Egypt at 2012.⁽²⁵⁾ In addition to that, dysmenorrhea (pain during menses) was reported by almost all students in study in which 59.8% of them had severe pain, followed by back ache and fatigue. This result matched with study done among Malaysian school girls in 2009.⁽²⁶⁾ Moreover, dysmenorrhea was more common among those who had irregular cycles, longer duration of flow and those who had premenstrual syndrome. In the study done by Banikarim⁽²⁷⁾ dysmenorrheal was the leading cause of short term school absenteeism, which is similar to this study, in which about 40.2% of students suffering from dysmenorrhea had reported to be absent from school merely due to the pain.

The present study demonstrates that the students mean knowledge score was low before implementation of program, these results coincide with those of other study in Saudi Arabia which revealed same results.⁽²⁸⁾ Also the results were reported by Hassaenen 2004⁽²⁹⁾ in Egypt, it was found that all girls had poor level of knowledge before implemented health education program. Such lack of knowledge was attributed to lack of

either formal or informal pre-menarche preparation.^(3,18) Contradictory with these results, the study done at 1994 in India, found that, the majority of the girls was having correct knowledge about menstruation.⁽³⁰⁾ It may be due to increase health awareness among school girls in India and culture differences between India and Egypt. After implementation of program, there was a significant increase in the knowledge score level of students from 53.18 to 86.68 scores.

The main sources of their information regarding menstrual hygienic practice were friends, mass media, and mother and/or grandmother. These results were similar to study in India 2010⁽³¹⁾ but these results converse with study done in Turkey 2007.⁽³²⁾ Which indicate that, internet are the main source of their information; it may be attributed to the effect of technology on increasing knowledge and obtaining needed information regarding Turkish adolescents in a secondary school.

In the present study, the pre-intervention menstrual beliefs among girls were found to be wrong and often incorrect. The majority of girls felt that "menstrual blood is impure" this is almost similar to 73.1% girls reporting menstruation as "release of bad blood" in a study conducted by Adinma E.⁽³³⁾ among Nigerian secondary school girls. While, in the post intervention phase there was a significant difference in the level of knowledge ($p < 0.001$). Similarly, in the pre intervention phase, the majority of girls reported that they do not visit holy places during menstruation and 39.2% girls reported they are kept isolated at home during menses. This shows the influence of socio-cultural beliefs and taboos regarding menstruation among these adolescent girls. Even literate females find it difficult to go against the restrictions, owing to such strong socio-cultural beliefs and practices. In the post intervention phase, there was a significant increase regarding students' visit of holy places during menstruation. In which the teaching of Islam states that a menstruating woman could enter mosques, but without praying. Such different types of restrictions practiced during menstruation were also reported by study done in India (2008).⁽³⁴⁾ In this study, there were 70.59 % of the girls did not attend any religious occasion, 42.65% did not play, 33.82% of them did not perform any household work and 10.29 percent of the girls did not attend any marriage ceremony during the menstrual period.

Hygiene related practices of girls during menstruation are of considerable importance

as it affects health by increasing vulnerability to infection especially infections of urinary tract and perineum. Good hygiene, such as use of sanitary pads and adequate washing of genital area, is essential during menstruation. Girls of reproductive age need access to clean and soft absorbent sanitary products, which in the long run protects their health. So, the menstrual hygiene and management is an issue that insufficiently acknowledged and has not received adequate attention.^(34,35) In the present study, during the pre-intervention phase, only 23.7% of girls reported that they wash their genitalia often with soap and water whenever they change their clothes or sanitary pads whereas following health education in the post intervention phase, there was significant improvement in the menstrual practice ($p < 0.001$).

In addition, in the present study, 8.2% of girls used piece of cloths (old cotton under wears) as bad while 86.6% girls used only sanitary pads during menses. In a study conducted in 2008 among Nigerian school girls⁽³³⁾ on materials used as menstrual absorbent, toilet tissue paper was most commonly used by 41.31% followed by sanitary pads 32.7%, clothes 14.4% and multiple materials 10.7% was used by the girls. It may be due to economic condition of the families in Nigeria.

It is seen that in the pre-intervention phase, 56.7% girls washed their under wear clothes only with water and 43.3% washed their clothes with soap and water which increased to 84.5% at post intervention phase. Moreover, in the pre-intervention phase 56.7% of girls reported that they changed their pad only twice a day while in the post intervention 54.6% of girls reported that they changed their pad four times per day thereby showing improved menstrual hygienic practices followed the health education. Thus, we can say that menstrual intervention program has played an important role for the adolescent's knowledge, which in turn improves their practices.

With regard to methods of dispose/dispose sanitary pad, in the pre-intervention period 74.2% of girls threw it in the house dustbin and 16.5% of girls threw it in the road side. In the post intervention period, all girls reported that they threw the sanitary pad in the dustbin. Moreover, in the pre intervention phase, 89.7% girls reported that they changed their under wears only twice /day. In the post intervention the percent increased to be 85.6% of girls changed it 3-4 times/day. This change resulting in menstrual education program where students understand

the relation between changing pads and developing of reproductive tract infection complications.

In many cultures including Egypt, pain is seen as a necessary part of menstruation and girls are brought up with this notion especially if the mother/or sister had experienced painful menstrual periods in her lifetime, in the pre-intervention phase medications taken for relieve pain reported by 48.3% of girls and this percent decreased after received intervention program to be 17.2%. The need for health education on menstruation and hygienic practice will help decrease anxiety level and improve healthy behavior of students that will in the end benefit their future.⁽³⁶⁾

A review of literature shows that there is a positive correlation between the knowledge and behavior. Although behavioral changes are usually the ultimate goal for health education programs, an increase in knowledge does not always cause behavior to change. It is, however, a prominent element in health education and is a necessary factor in changing some health behaviors.^(5,12) The present study was in agreement with Seidman⁽³⁷⁾ who stated that women's knowledge seemed to affect their practices during menstruation, after depending on increase students' knowledge and awareness regarding menstrual hygienic practices. Findings of the present study illustrated that, the change in the level of knowledge had a positive effect on behavior and affect adolescent's menstrual practices. In general, the change of practices was unexpected as the assessment was done after three months of the sessions; total students' practice scores was improved from satisfactory practices in pre intervention phase 63.9% to good practices was 77.3% in post intervention phase.

Regarding sanitary pads, 79.4% of girls said that they felt shy/ embarrassed to see the advertisements of sanitary pads on television in front of male members of the family. While 3.1% of them reported that such advertisements should be banned. Thus, we can say that such advertisements should be more informative and girls-friendly so they can be perceived well by adolescent girls. Moreover, the findings emphasize on the inclusion of safe hygiene and sanitary practices should be included in the school curricula as well as greater communication between students and lady teachers and between daughters and mothers.

Though menstruation is an indication of positive reproductive health status of women, the issue of pre menstruation and menstruation

symptoms need to be well understood and managed by young women. Many of the symptoms are likely to affect the social, emotional health of young adolescent. Therefore, authorities of schools need to develop strategies to meet reproductive health challenges of students' girls. They also need to be encouraged to seek medical advice for their needs. So, reproductive health education must be encouraged early in life in primary, preparatory and secondary schools in our country.

Conclusion & Recommendations

The present study has revealed unhealthy menstrual practices, satisfactory level of knowledge and various misconceptions among adolescent school girls regarding menstruation. The study also clearly brings out the impact of health education in improving their knowledge and practices. Taking into account the health implications and prevailing socio-cultural and economic factors. There is an urgent need for intensifying effective strategies to persuade the adolescent school girls to adopt healthy menstrual practices. A well-informed continuous education program should be imparted to adolescent girls at schools and clubs. Therefore, designing and implementing health educational programs about menstrual hygiene are necessities and the replication of the same program among elementary, preparatory, and other secondary schools are important for improvement of students' menstrual knowledge, attitudes and practice. Further, emphasis also needs to be given through workshops and seminars on "Adolescent Reproductive Health". Finally, the massive role of mass media for dissemination of healthy knowledge and correction of misconceptions among adolescents' girls should be emphasized.

Acknowledgment

Our deep gratitude goes to our study subjects who volunteered and took their time to give us all the relevant information for the study. Last but not least, we would like to thank the respective school administrator for cooperation and help during the data collection and implementation of program.

Corresponding author

Reem Bassiouny El-Lassy
Community Health Nursing Department, Faculty of Nursing, Damanhour University
reembass@yahoo.com

References

- 1- Kavitha S, PhilM. Reproductive Health and Hygiene among Adolescents in India.2012.Available at: www.Languageinindia.com
- 2- Marianne E, McPherson E, Korfine L. Menstruation across time: menarche, menstrual attitudes, experiences and behaviors. *Women's Health Issues* 2004; 14: 193 – 200.
- 3- World Health Organization. Adolescent friendly health services. An agenda for change. World Health Organization. Geneva: 2002.
- 4- Harlow D, Cambpbell O. Epidemiology of menstrual disorders in developing countries: a systematic review. *British Journal of Obstetrics and Gynecology* 2004; 111: 6 -16.
- 5- Poureslami M, Osati F. Attitude of female adolescents about dysmenorrhea and menstrual hygiene in Tehran suburbs. *Archives of Iranian Medicine* 2002; 5: 377-396.
- 6- Parwej S, Kumar R, Walia I, Aggarwal K. Reproductive health education intervention trial. *Indian. J Pediatr.* 2005;72:287-91.
- 7- Kibret M. Knowledge, attitude and practice on reproductive health among high school students in Bahir. Dar, Ethiopia. *Afr J Reprod. Health* 2003;7:39-45.
- 8- Moawed S. Indigenous practices of Saudi girls in Riyadh during their menstrual period. *Eastern Mediterranean Health Journal* 2001; 7(1/2):197-203.
- 9- Rahman A. Early adolescent girl understands of menstruation. *Women and Health Journal* 1997; 19(2):10-5.
- 10- Kumar R, Raizada A, Agarwal K, Kaur M. Adolescent behavior regarding reproductive health. *Indian J Pediatr.* 2000; 67:877-82.
- 11- AberaY. Menarche, Menstruation related Problems and Practices among Adolescent High School Girls in Addis Ababa. Master thesis, Addis Ababa University 2004.
- 12- Barua A, Kathleen K. Reproductive Health seeking by married adolescent girls in Maharashtra, India. *Reproductive Health matters* 2001; 9 (17): 53 –62.
- 13- Baridalayne N. Menstruation knowledge, beliefs and practices of women in the reproductive age group residing in an urban settlement colony of Delhi. *Health and population perspectives and issue*2004; 27 (1): 9 – 16.
- 14- Lena A,Nair N. Effectiveness of Reproductive Health Education among Rural Adolescent Girls: A school based intervention study in UdupiTaluk, Karnataka. *Indian Journal of Medical Sciences* 2008; 62 (11): 439 – 443.
- 15- Wickramasinghe D. Managing menstrual hygiene in emergency situations: How far from reality? *Bangladesh* 31 January -2 February 2012.

- 16- Burns G. Toward healthy people: The role of the nurse practitioner and health promotion. *Journal of the American Academy of Nurse Practitioners* 2001; 6(1):29-35.
- 17- Kirchstein R. Research on woman health. *American Journal of Public Health* 1991; 81(3):291-3.
- 18- El-Gilany A, Khalil A, Shady I. KAP of adolescent schoolgirls about menstruation in Mansoura, Egypt. *Bulletin of High Institute of Public Health* 2004; 34(2):377-96.
- 19- Mobarak E, Mohey A, Kishk N. Experience of menarche among girls in Alexandria: Community-based study. *Bulletin of High Institute of Public Health* 2004; 34(2):335-56.
- 20- Fawaz A, Heitham A, Kamel A. Age at menarche in Jordanian girls. *Saudi Med J*. 2004; 25(20): 144-5.
- 21- Parvathy N, Vijay G, Kannan T. Awareness and practices of menstruation and pubertal changes amongst unmarried female adolescent in rural area of East Delhi. *Indian Journal of Community Medicine* 2007; 32 (2): 156-157.
- 22- El-GilanyH, Badawi K. Menstrual hygiene among adolescent schoolgirls in Mansoura, Egypt. *Reprod. Health Matters* 2005;13:147-52.
- 23- Diaz A, Laufer R, Breech L. Menstruation in girls and adolescents: using the menstrual cycle as a vital sign. *Pediatrics* 2006; 118:2245–2250.
- 24- Zegeye D. Age at menarche and the menstrual pattern of secondary school adolescents in northwest Ethiopia. *BMC Women's Health* 2009; 9: 29.
- 25- EswiA, HelalH, Elarousy W. Menstrual attitude and knowledge among Egyptian female adolescents. *Journal of American Science* 2012; 8(6): 555-565.
- 26- Lee K, Chen Y, Lee K, Kaur J. Menstruation among adolescent girls in Malaysia: a cross-sectional school survey. *Singapore Medical Journal* 2006; 47:869–874.
- 27- Banikarim C, Chacko R, Kelder H. Prevalence and impact of dysmenorrhea on Hispanic female adolescents. *Arch Pediatr. Adolesc Med.* 2000; 154:1226–1229.
- 28- Al Ayafi S. Factors associated with health behavior regarding menstruation among Saudi intermediate school girls in Riyadh City. Master thesis, Nursing College, King Saud University 1999.
- 29- Hassanen H, Tosson M, Abd El-Elkareem E. Effect of health education and training program for secondary school students on menstruation at Assiut Governorate. *Bulletin of High Institute of Public Health* 2004; 34(3): 575-94.
- 30- Drakashayani D, VenkataR. A study on menstrual hygiene among rural adolescent girls. *Indian J Med Sci.* 1994; 48(6): 139- 43.
- 31- Dipali N, Seema A. Impact of health education on knowledge and practices about menstruation among adolescent school girls of Kalamboli, Navi- Mumbai. *Health and Population: Perspectives and Issues* 2010; 32 (4): 167-175.
- 32- Sule T, Ukwenya E. Menstrual experiences of adolescents in a secondary school. *Turkish-German Gynecol Assoc.* 2007; 8:7–14.
- 33- Adinma E, Adinma J. Perception and practices on menstruation amongst Nigerian secondary school girls. *African Journal of Reproductive Health* 2008; 12 (1): 74-83.
- 34- Dasgupta A. Menstrual hygiene: How hygienic is the adolescent girls? *Indian Journal of Community Medicine* 2008; 33 (2): 77 – 80.
- 35- RajnidhingraA. Knowledge and practice related menstruation among tribal (gujjar) adolescent girls. *Ethno – Med* 2009; 1(3):43 – 48.
- 36- Koff E, Rierdan J. Preparing girls for menstruation: Recommendations from adolescent girls. *Adolescent Journal* 1995; 30:120-7.
- 37- Seidman Y. Effects of a premenstrual syndrome education program on premenstrual symptomatology. *Health Care for Women International* 1990; 11(4):491-501.