

The Effect of an Educational Booklet about Menstruation on Female Nursing Students' Knowledge, Practices and Beliefs.

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Abstract Menstruation cycle is a normal physiological process that is managed differently according to various social and cultural understandings.

Aim of the study: to determine the effect of an educational booklet about menstruation on female nursing students' knowledge, practices and beliefs. A convenient sample of 200 female nursing students who enrolled in the first academic year (2017-2018) at the Technical Institute of Nursing affiliated to the University of Alexandria, and accepted to participate in the study were included in the study. The study was done during the first semester of the third year of the academic year (2017-2018). Tools of data collection: Part (I) students' Socio demographic data. Part (II): Students' knowledge about menstruation. Part (III): Students' practices during menstruation. Part (IV): Students' beliefs about menstruation. Results: A highly statistically significant difference was observed between pre & post-test as the students' mean knowledge score was good (7%) in pre-test, compared to almost all of them (99%) in post-test. Menstrual practices among them was found to be poor before the educational session, while in the post-test, there were a significant differences in student's level of knowledge and practices. There was a highly statistically significant difference between pre & post-test regarding score of beliefs about menstruation.

Conclusion: adolescent girls must be educated about menstrual and hygiene practices to improve menstrual hygiene and bring them out of traditional beliefs, misunderstandings and restrictions on menstruation..

Recommendations: Therefore, it is recommended to implement health educational programs about menstrual hygiene to preparatory and secondary school students to improve their menstrual knowledge, believes and practices..

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

Date of Submission: 01-01-2019

Date of acceptance: 15-01-2019

I. Introduction

Adolescent period is considered between the ages of 19-10yrs., among girls and boys both. Adolescence in girls is a phase of transition from girlhood to womanhood and marks the onset of female puberty. This period of attaining reproductive maturity between the ages of 10-19 years is marked by a number of physiological, behavioral and psychological changes, the most notable being the onset of menstruation.⁽¹⁻³⁾ Handling menstruation is considered a major challenge before every adolescent girl, which is a normal body function in females.⁽³⁻⁴⁾

Menstruation is the periodic and cyclical discharge of blood, mucus and cellular debris from the uterine mucosa, which occurs due to progesterone withdrawal after ovulation in non-fertile cycles.⁽⁴⁾ Menstruation and menstrual practices are still clouded by taboos and socio-cultural restrictions resulting in adolescent girls remaining ignorant of the scientific facts and hygienic health practices, which sometimes result into adverse health outcomes.⁽⁵⁻⁶⁾

There is a substantial lacuna in the knowledge about menstruation among adolescent girls. Several research studies have revealed this gap and they have shown that there was a low level of awareness about menstruation among the girls when they first experienced it.⁽¹⁻⁷⁾ Social prohibitions and the negative attitude of parents for open discussion on related issues have blocked the access of adolescent girls to right kind of information, especially in the rural area. Previous studies have revealed that most of the adolescent girls had incomplete and inaccurate information about the menstrual physiology and hygiene. It also revealed that mothers, television, friends, teachers and relatives were the main sources that provide information on menstruation to the adolescent girls.⁽³⁻⁸⁾

Significance of the study: To respond to the increased international attention on empowering girls. The present study was undertaken with an objective to determine the effect of an educational booklet about menstruation on female nursing students' knowledge, practices and beliefs.

I. Research aim and questions

Aim of the study: to determine the effect of an educational booklet about menstruation on female nursing students' knowledge, practices and beliefs.

Research hypotheses:

Female nursing students' scores of knowledge, practices and attitudes regarding menstruation in the post-test are higher than those of the pretest.

II. Materials And Method

Materials:

2.1 Research design: Quasi-experimental pre-post- test design was with no control group design was adopted.

2.2 Setting

This study was conducted at the Technical Institute of Nursing affiliated to the University of Alexandria.

2.3 Subjects:

A convenient sample of 200 female nursing students who enrolled in the first academic year (2017-2018) of the previously mentioned setting and accepted to participate in the study were included in the study. First year female nursing students were chosen because they are still in the late adolescent period (18-20 years); during which many factors may affect their reproductive health such as inadequate knowledge and misbelieve about reproductive health and human sexuality as well as lack of access to comprehensive health care services and health risks (e.g. reproductive tract infections). They were also selected because the developed booklet will help them counsel girls and their families about menstruation after graduation .

2.4 Tool for data collection: included two parts:

A specially designed questionnaire sheet was developed, validated and used to collect the necessary data. It included four parts;

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

Part I: Socio demographic data such as age, mothers' and fathers' level of education as well as occupation; in addition to residence, type of family, and crowding index.

Part II: Students' knowledge about menstruation as definition of menstruation, age of menarche, signs and symptoms associated with menstruation definition, duration, interval, and amount of menstruation, as well as age at menarche. It also included female internal genital organs; organs govern menstruation, maturation of ovum at birth/puberty; definition and time of ovulation as well as factors affecting menstruation; premenstrual physical and psychological symptoms in addition to sources of information.

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

This section consists of 14 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 score of knowledge was obtained for each student (0-28). Percent of the total knowledge score was calculated as follows:

Percent of the total knowledge score
Poor knowledge < 9 (<50%)
Fair 9 - <18 (50 - < 75%)
Good ≥ 18(≥ 75%)

A scoring system for the study subjects' knowledge about menstruation (14 questions) was used. Every knowledge item was given a score; correct and complete answer (2), correct and incomplete answer (1) as well as incorrect answer or don't know (0). The total score of knowledge ranged between 0-28 and was classified as good (18-28), fair (9-<18) and weak (0<9).

Part III: Students' practices during menstruation, which entailed drinking or eating hot/cold food during, in addition household activities; physical effort; rest and sleep. It also encompassed removal of pubic hair and bathing as well as perineal care and perineal pad (type, frequency and dealing with). In addition, this part involved clothes (type, way of washing and drying) as well as way of relieving pain.

A scoring system for the study subjects' practices during menstruation (24 questions) was used. Every practice item was given a score; done correctly & completely (2), done correctly & incompletely (1) as well as done incorrectly or not done (0). The maximum score was ranged from (32-48 points). Percent of total practice score was categorized as follows:

Percent of the total practice score
Poor practice < 16 (<50%)
Fair 16 - < 32 (50 - < 75%)
Good \geq 32 (\geq 75%)

Part IV: Students' beliefs about to menstruation, which composed of 22 items; 11 positive & 11 negative. Each positive belief item was given a score; agree (3), not sure (2), disagree (1); this score was reversed for negative beliefs. The total score of beliefs ranged from 22-66 and was classified as positive (52-66), neutral (37- < 52) and negative (22 - < 37).

2.5 Methods

Administrative process:

Approval from the responsible authorities was obtained from the responsible authority of the study sitting to conduct the study, after explaining its purpose.

Study tool:

- The tools were developed by researchers after an in-depth review of the related recent relevant literature⁽¹¹⁻¹³⁾ and were sent to five experts in the field of education and pediatric nursing to check content validity. Necessary modifications were carried out accordingly.
- Cronbach alpha coefficient was used to test the tool I ($r=0.801$), and tool II reliability ($r=0.819$) these result indicating that the tools was 80% reliable.

Pilot study:

Pilot study was conducted on 20 (10 %) of students they were excluded from the total number of students to insure the clarity and comprehensiveness of the tool.

Data collection:

The data were collected over a period of three months during the first term of last semester of October - December of the academic year 2017-2018. Self-administered questionnaire was distributed to students in the Technical Institute of Nursing affiliated to Alexandria Universities.

Ethical considerations:

All students were informed about the purpose of the study and given brief explanation; consequently written informed consent was obtained from each of them.

- The right to refuse to participate or withdraw from the study was emphasized after reassuring students that their answer would have no influence on their grades.
- Data Anonymity and confidentiality were appreciated.

Procedure:

Assessment phase:

- The questionnaire sheet was distributed to the students for pre-test; data collected was analyzed to determine students' knowledge, practices and beliefs regarding menstruation before the development of the educational booklet. The analysis of pre-test data showed lack of knowledge, practices and beliefs among students. Accordingly, an educational booklet about menstruation was developed.

Planning phase:

Based on baseline data obtained from pre-test assessment and relevant review of literature, the educational booklet was developed by the researcher in a form of printed Arabic booklet to satisfy the studied students regarding knowledge, practices and beliefs of menstruation.

General objective of the educational booklet: was to improve student's knowledge, practices and beliefs about menstruation.

Specific objectives of the educational booklet: after completion of the educational sessions, each student should be able to:

- ☒ Physical Changes During Puberty
- ☒ Female Reproductive System
- ☒ Menstrual Cycle Calendar
- ☒ Menstrual Hygiene Management
- ☒ Identify healthy habits & practices to modify lifestyle.

Implementation phase:

- Implementation of an educational intervention took (24) weeks period. Data were collected 4days /week by the researcher.
- The educational intervention involved (5) scheduled sessions. These sessions were repeated to each subgroup of (20-25) girls. The duration of each session lasted from half an hour to one hour including periods of discussion according to their achievement, progress and feedback. At the beginning of the first session an orientation to the educational sessions and its aims took place. Different methods of teaching were used such as modified lecture, group discussion and brainstorming. Suitable teaching media were included an educational booklet that distributed to students in the first day of the educational sessions.

Evaluation phase

- After one month, evaluation of the effectiveness of the educational session was measured by re-assessing the students' knowledge, practices and beliefs regarding menstruation using the same questionnaire sheet (post-test).
- A comparison was done between the students' knowledge, practices and beliefs regarding menstruation before and after the distribution of the educational booklet (pre & post-test).
- Collection of data covered a period of 3 months (from beginning of October to the end of December 2017).

Statistical Analysis:

- The collected data was categorized, coded, computerized, tabulated and analyzed using Statistical Package for Social Sciences (SPSS) version 20 program. Cross tabulation was used to explore relationships between variables. A descriptive and analytical statistics were used such as percentages. Chi-square, and Fisher Exact tests were also used at ≤ 0.05 level of significance to find out the difference in the results

III. Results

Table (I): Number and percent distribution of students according to their socio - demographic data

Socio - demographic data	No	%
Age:		
18	136	68.00
19	62	31.00
20	2	01.00
Mothers' level of education:		
- Illiterate/read & write	80	40.00
- Basic	12	06.00
- Secondary or its equivalent	90	45.00
- University	18	09.00
Mothers' occupation:		
- Housewife	166	83.00
- Working	34	17.00
Mother's type of work:	(n=34)	
- Employee	32	94.12
- Professional	2	05.88
Fathers' level of education:		
- Illiterate/read & write	38	19
- Basic	32	16
- Secondary or its equivalent	80	40
- University & more	50	25
Fathers' occupation:		
- Employee	100	50.00
- Farmer	24	12.00
- Worker	22	11.00
- Merchant	20	10.00
- Retired or not working	18	09.00
- Professional	16	08.00
Residence:		
- Rural	148	74.00
- Urban	52	26.00
Type of family:		
- Nuclear	150	75.00
- Extended	50	25.00
Crowding index:		
- Not crowded (<2)	126	63.00
- Crowded (>2)	74	37.00

Moreover, it was revealed that students' correct & complete answers in term *premenstrual psychological symptoms & definition of ovulation* were mounted up from 0% & 1% respectively in the pre-test to 54% & 53% respectively in the post-test. Furthermore, students' correct & complete answers as for *premenstrual physical symptoms & definition of menstruation* were elevated from 0% & 1% respectively in the pre-test to 45% & 35% respectively in the post-test. Likewise, students' correct & complete answers in respect to *factors affecting menstruation and organs govern menstruation* were went up from 0% & 1% respectively in the pre-test to 67% & 59% respectively in the post-test.

Highly statistically significant differences were found between students' knowledge about menstruation in the pre and the post-test in relation to interval of menstruation ($P < 0.0001$); definition and amount of menstruation; definition and time of ovulation; female internal genital organs; factors affecting menstruation, organs govern menstruation; as well as premenstrual physical and psychological symptoms ($P = 0.000$). Statistically significant differences were also observed as regard duration of menstruation ($P = 0.008$) and age at menarche ($P = 0.041$).

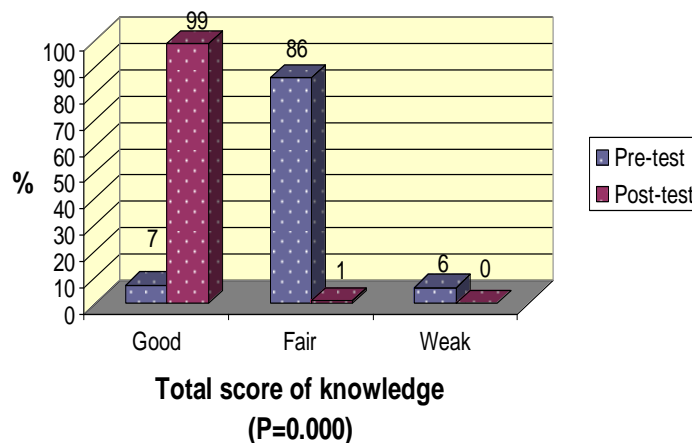


Figure (1): Percent distribution of students according to their pre & post-test total score of knowledge about menstruation

Figure (1) sheds light upon the percent distribution of students according to their pre & post-test total score of knowledge about menstruation. It was found that good total score was obtained by only 7% of students in pre-test, compared to almost all of them (99%) in post-test. A highly statistically significant difference was observed between pre & post-test.

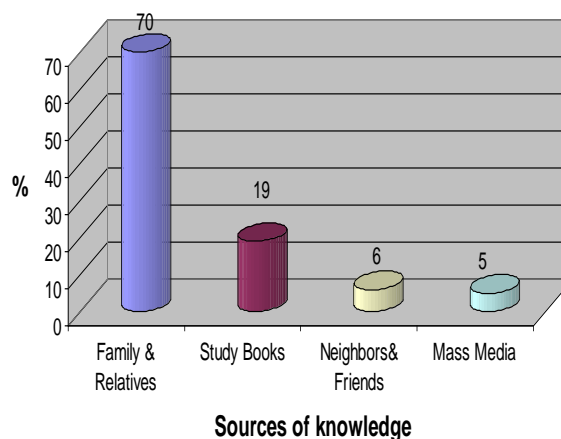


Figure (2): Percent distribution of students according to their sources of knowledge about menstruation

Figure (2) brings to light the percent distribution of students according to their sources of knowledge about menstruation. Family and relatives were the main source of knowledge for a sizeable proportion of students (70%), compared to study books (19%), neighbors and friends (6%) and mass media (5%).

Table (III): Number and percent distribution of students according to their practices during menstruation

Students' practices during menstruation	Pre-test (200)						Post-test (200)						F / χ^2 (P)
	Done correctly & completely		Done correctly & incompletely		Done incorrectly or not done		Done correctly & completely		Done correctly & incompletely		Done incorrectly or not done		
	No	%	No	%	No	%	No	%	No	%	No	%	
Kind of food taken	0	00.00	26	13.00	174	87.00	42	21.00	116	58.00	42	21.00	179.709 (<0.0001)*
Amount of water intake	106	53.00	0	00.00	94	47.00	178	89.00	0	00.00	22	11.00	52.752 (<0.0001)*
Kind of fluids taken	198	99.00	0	00.00	2	01.00	200	100.00	0	00.00	0	00.00	2.01 (0.156)
Reduced food & fluids	4	02.00	14	07.00	182	91.00	64	32.00	84	42.00	52	26.00	175.163 (<0.0001)*
Doing household activities	98	49.00	0	00.00	102	51.00	156	78.00	0	00.00	44	22.00	36.285 (<0.0001)*
Exposure to physical effort & fatigue	38	19.00	0	00.00	162	81.00	92	46.00	0	00.00	108	54.00	33.231 (<0.0001)*
Doing strenuous exercises	184	92.00	0	00.00	16	08.00	190	95.00	0	00.00	10	05.00	1.481 (0.224)
Taking periods of rest & sleep	148	74.00	0	00.00	52	26.00	188	94.00	0	00.00	12	06.00	29.762 (<0.0001)*
Removing pubic hair	166	83.00	0	00.00	34	17.00	188	94.00	0	00.00	12	06.00	11.889 (0.001)*
Taking bath	144	72.00	0	00.00	56	28.00	164	82.00	0	00.00	36	18.00	5.647 (0.017)*
Frequency of taking bath	30	15.00	0	00.00	170	85.00	80	40.00	0	00.00	120	60.00	31.348 (<0.0001)*
Water temperature used for taking bath	80	40.00	0	00.00	120	60.00	150	75.00	0	00.00	50	25.00	50.128 (<0.0001)*
Washing genitalia with every toilet use	172	86.00	0	00.00	28	14.00	194	97.00	0	00.00	6	03.00	15.558 (<0.0001)*
Sitting in warm water	172	86.00	0	00.00	28	14.00	160	80.00	0	00.00	40	20.00	2.551 (0.110)
Type of clothes dressed	146	73.00	0	00.00	54	27.00	184	92.00	0	00.00	16	08.00	25.004 (<0.0001)*
Way of washing underwear	198	99.00	0	00.00	2	01.00	198	99.00	0	00.00	2	01.00	0 (1.000)
Way of drying underwear	150	75.00	0	00.00	50	25.00	178	89.00	0	00.00	22	11.00	13.279 (0.000)*
Type of used pads	160	80.00	0	00.00	40	20.00	188	94.00	0	00.00	12	06.00	17.33 (<0.0001)*
Number of changing pad /day	20	10.00	0	00.00	180	90.00	74	37.00	0	00.00	126	63.00	35.003 (<0.0001)*
Frequency of changing pad	102	51.00	0	00.00	98	49.00	142	71.00	0	00.00	58	29.00	16.814 (<0.0001)*
Warping used pad before disposal	138	69.00	0	00.00	62	31.00	184	92.00	0	00.00	16	08.00	33.7 (<0.0001)*
Way of disposing	172	86.00	0	00.00	28	14.00	192	96.00	0	00.00	8	04.00	12.21 (0.001)*

pad													
Way of relieving pain	18	09.00	150	75.00	32	16.00	88	44.00	104	52.00	8	04.00	68.957 (<0.0001)*

χ^2 (P): Chi-Square Test &P for χ^2 Test F(P): Fisher Exact test &P for F Test *: Significant at P ≤0.05

Table (II) illustrates the number and percent distribution of students according to their practices during menstruation. It was observed that *washing genitalia with every toilet use; way of disposing pad; removing pubic hair and type of used pads* were done correctly & completely by 86%, 86%, 83% & 80% of students respectively in the pre-test, compared to 97%, 96%, 94% & 94% of them respectively in the post-test. *Way of drying underwear; taking periods of rest & sleep; type of clothes dressed and taking bath* were also done correctly & completely by 75%, 74%, 73% & 72% of students respectively in the pre-test, compared to 89%, 94%, 92% & 82% of them respectively in the post-test.

In addition, *warping used pad before disposal; amount of water intake and frequency of changing pad* were done correctly & completely by 69%, 53% & 51% of students respectively in the pre-test, compared to 92%, 89% & 71% of them respectively in the post-test. Moreover, *doing household activities; water temperature used for washing genitalia and for taking bath* were done correctly & completely by 49%, 45% & 40% of students respectively in the pre-test, compared to 78%, 81% & 75% of them respectively in the post-test.

Furthermore, *exposure to physical effort and fatigue as well as frequency of taking bath; number of changing pad /day; and way of relieving pain* were done correctly & completely by 19%, 15%, 10% & 9% of students respectively in the pre-test, compared to 46%, 40% , 37% & 44% of them respectively in the post-test. Likewise, *kind of food taken as well as reduced food and fluids* were done correctly & completely by 0% & 2% of students respectively in the pre-test, compared to 21% & 32% of them respectively in the post-test.

The relationship between students' practices during menstruation in the pre and the post-test was found to be highly statistically significant regarding kind of food taken; amount of water intake; reduced food & fluids; doing household activities; exposure to physical effort & fatigue; water temperature used for taking bath; frequency of taking bath; taking periods of rest & sleep; washing genitalia with every toilet use; type of clothes dressed; type of used pads; number of changing pad /day; frequency of changing pad; warping used pad; and way of relieving pain (P=<0.0001); as well as water temperature used for washing genitalia and way of drying underwear (P=0.000).

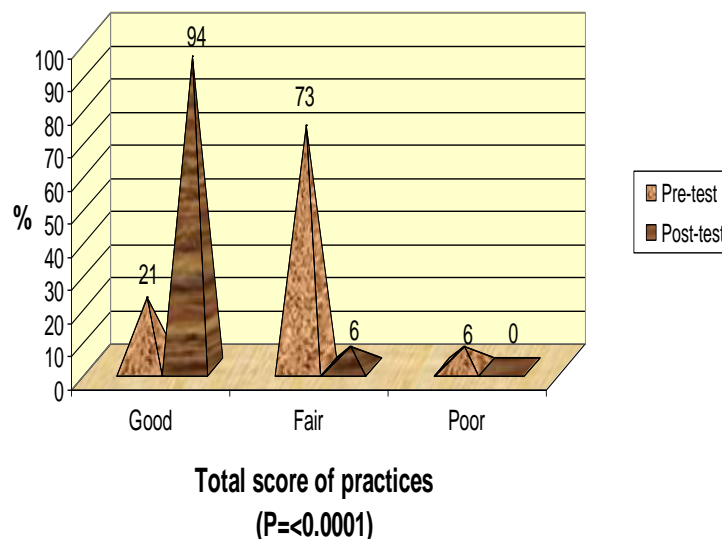


Figure (3): Percent distribution of students according to their pre-test & post-test total score of practices during menstruation

Figure (3) elucidates the percent distribution of students according to their pre & post-test total score of practices during menstruation. It was observed that good total score was obtained by only 21% of students in the pre-test, compared to most of them (94%) in the post-test. The relationship between pre & post-test was found to be highly statistically significant ($P < 0.0001$).

Table (IV): Number and percent distribution of students according to their positive beliefs about menstruation

Students' positive beliefs about menstruation	Pre-test (200)						Post-test (200)						F / χ^2 (P)
	Agree		Not sure		Disagree		Agree		Not sure		Disagree		
	No	%	No	%	No	%	No	%	No	%	No	%	
Strenuous exercises during menstruation cause bleeding	104	52.00	82	41.00	14	07.00	166	83.00	24	12.00	10	05.00	46.64 (<0.0001)*
Outdoor activities during menstruation don't cause common cold	60	30.00	110	55.00	30	15.00	90	45.00	90	45.00	20	10.00	10 (0.007)
Excessive blood loss during menstruation causes anemia	88	44.00	46	23.00	66	33.00	96	48.00	40	20.00	64	32.00	0.797 (0.671)
Taking warm fluids during menstruation alleviates its pain	192	96.00	6	03.00	2	01.00	198	99.00	2	1.00	0	0.00	4.092 (0.129)
Taking cold fluids during menstruation increases its pain	98	49.00	56	28.00	46	23.00	154	77.00	36	18.00	10	05.00	39.935 (<0.0001)*
Drinking much water during menstruation reduces abdominal gases	74	37.00	114	57.00	12	06.00	176	88.00	24	12.00	0	00.00	112.312 (<0.0001)*
Avoiding carbohydrates & fats during menstruation reduces uterine contractions	36	18.00	140	70.00	24	12.00	136	68.00	52	26.00	12	06.00	102.473 (<0.0001)*
Preparation of girl before menstruation makes her deal with it in a healthy way	184	92.00	12	06.00	4	02.00	190	95.00	10	05.00	0	00.00	4.278 (0.118)
Changing sanitary pads doesn't cause common cold	94	47.00	78	39.00	28	14.00	122	61.00	44	22.00	34	17.00	13.686 (0.001)*
Unhealthy habits during menstruation lead to infection	124	62.00	54	27.00	22	11.00	154	77.00	38	19.00	8	04.00	12.553 (0.002)*
Girls should participate in social activities during menstruation	128	64.00	54	27.00	18	09.00	180	90.00	14	07.00	6	03.00	38.309 (<0.0001)*

χ^2 (P): Chi-Square Test & P for χ^2 Test F (P): Fisher Exact test & P for F Test *: Significant at $P \leq 0.05$

Table (IV) presents the number and percent distribution of students according to their positive beliefs about menstruation. It was noted that 64% & 62% of students agreed that *girls should participate in social activities during menstruation* and *unhealthy habits during menstruation lead to infection* respectively in the pre-test, compared to 90% & 77% of them respectively in the post test.

It was also found that 52%, 49% & 47% of students agreed that *strenuous exercises during menstruation because bleeding*; *taking cold fluids during menstruation increases its pain* and *changing sanitary pads don't cause common cold* respectively in the pre-test, compared to 83%, 77% & 61% of them respectively in the post test.

In addition, it was observed that 37% & 18% of students agreed that *drinking much water during menstruation reduces abdominal gases as well as avoiding carbohydrates and fats during menstruation reduce uterine contractions* respectively in the pre-test, compared to 88% & 68% of them respectively in the post test.

Highly statistically significant differences were noticed between students' positive beliefs about menstruation in the pre and the post-test in relation to the beliefs that strenuous exercises during

menstruation cause bleeding; taking cold fluids during menstruation increases its pain; drinking much water during menstruation reduces abdominal gases; avoiding carbohydrates and fats during menstruation reduces uterine contractions as well as girls should participate in social activities during menstruation ($P < 0.0001$); Statistically significant differences were also observed regarding the beliefs that changing sanitary pads doesn't cause common cold ($P = 0.001$) and unhealthy habits during menstruation lead to infection ($P = 0.002$).

Table (V): Number and percent distribution of students according to their negative beliefs about menstruation

Students' negative beliefs about menstruation	Pre-test (200)						Post-test (200)						F / χ^2 (P)
	Agree		Not sure		Disagree		Agree		Not sure		Disagree		
	No	%	No	%	No	%	No	%	No	%	No	%	
Bathing during menstruation causes lower backache	80	40.00	72	36.00	48	24.00	46	23.00	22	11.00	132	66.00	74.97 (<0.0001)*
Bathing during menstruation causes falling of hair	102	51.00	68	34.00	30	15.00	64	32.00	48	24.00	88	44.00	40.656 (<0.0001)*
Doing usual daily activities during menstruation leads to bleeding	28	14.00	54	27.00	118	59.00	24	12.00	10	05.00	166	83.00	38.67 (<0.0001)*
Outdoor activities during menstruation cause pain	116	58.00	42	21.00	42	21.00	82	41.00	18	09.00	100	50.00	39.129 (<0.0001)*
Drinking warm/cold fluids during menstruation affects its flow	136	68.00	50	25.00	14	07.00	130	65.00	36	18.00	34	17.00	10.748 (0.005)*
Sitting in warm water help menstrual blood flow	110	55.00	78	39.00	12	06.00	94	47.00	28	14.00	78	39.00	73.24 (<0.0001)*
Menstrual blood is impure	180	90.00	14	07.00	6	03.00	130	65.00	20	10.00	50	25.00	43.695 (<0.0001)*
Taking bath during menstruation can replace changing sanitary pad	38	19.00	48	24.00	114	57.00	18	09.00	22	11.00	160	80.00	24.523 (0.000)*
Avoiding egg, meat & poultry during menstruation doesn't cause nausea & vomiting	42	21.00	104	52.00	54	27.00	42	21.00	54	27.00	104	52.00	31.646 (<0.0001)*
Eating food rich in vitamin C during menstruation causes its cessation	22	11.00	138	69.00	40	20.00	66	18.00	98	49.00	36	33.00	28.99 (<0.0001)*
Touching plants & babies during menstruation should be voided	24	12.00	88	44.00	88	44.00	20	10.00	86	43.00	94	47.00	0.584 (0.746)

χ^2 (P): Chi-Square Test &P for χ^2 Test F (P): Fisher Exact test &P for F Test * Significant at $P \leq 0.05$

Table (V) illustrates the number and percent distribution of students according to their negative beliefs about menstruation. It was found that 59% & 57% of students disagreed that doing usual daily activities during menstruation leads to bleeding and taking bath during menstruation can replace changing sanitary pad respectively in the pre-test, compared to 83% & 80% of them respectively in the post-test.

It was also observed that 27%, 24%, 21% & 20% of students respectively disagreed that avoiding egg, meat and poultry during menstruation doesn't cause nausea and vomiting; bathing during menstruation causes lower backache; outdoor activities during menstruation cause pain; and eating food rich in vitamin C during menstruation causes its cessation respectively in the pre-test, compared to 52%, 66%, 50% & 33% of them respectively in the post-test.

In addition, it was revealed that 15%, 7%, 6% & 3% of students disagreed that bathing during menstruation causes falling of hair; drinking warm/cold fluids during menstruation affects its flow; sitting in

warm water help menstrual blood flow; and menstrual blood is impure respectively in the pre-test, compared to 44%, 17%, 39% & 25 of them respectively in the post-test.

The relationship between students' negative beliefs during menstruation in the pre and the post-test was found to be highly statistically significant regarding the beliefs that bathing during menstruation causes lower backache; eating food rich in vitamin C during menstruation causes its cessation; doing usual daily activities during menstruation leads to bleeding; outdoor activities during menstruation cause pain; sitting in warm water help menstrual blood flow; menstrual blood is impure; bathing during menstruation causes falling of hair; as well as avoiding egg, meat & poultry during menstruation doesn't cause nausea and vomiting ($P < 0.0001$); in addition to the belief that taking bath during menstruation can replace changing sanitary pad ($P = 0.000$). It was also statistically significant as for the belief that drinking warm/cold fluids during menstruation affects its flow ($P = 0.005$).

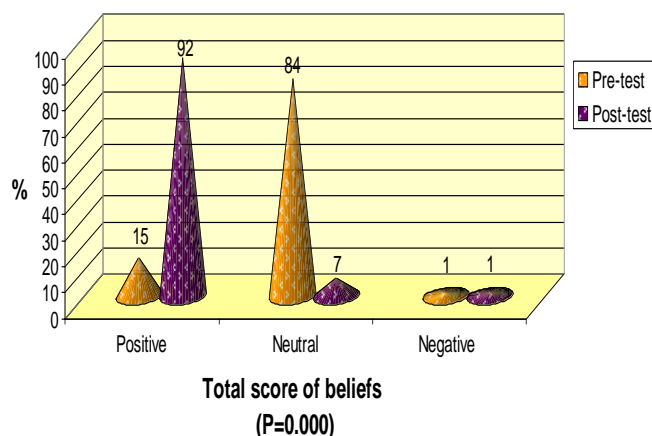


Figure (4): Percent distribution of students according to their pre-test & post-test total score of beliefs about menstruation

Figure (4) displays Percent distribution of students according to their pre & post-test total score of beliefs during menstruation, it was noticed that good total score was obtained by 51% of students in pre-test, compared to the vast majority (92%) in post-test. On the other hand, fair total score was attained by 84% of them in the pre-test, compared to only 7% of students in the post-test. A highly statistically significant difference was observed between pre & post-test.

IV. Discussion

Menstruation is a normal physiological process that occurs to all women during their reproductive life. Girls and women 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⁽¹⁴⁾

Better appreciation of and attitude towards menstruation are achieved when the girl is aware or knowledgeable about menstruation.⁽¹⁵⁾ According to Auemanekul et al. and Sadiq M and Salih A, females with greater knowledge on menstruation were better in practicing good menstrual hygiene.^(16,17) Several studies reported low to average levels of awareness of menstruation at menarche between 36.9% and 67.5%^(1, 13, 16, 18-20).

This study was carried out to improve lifestyle among nursing students regarding menstrual through educational training program. In the present study the age of menstruating girls ranged from 10 to 19 years with maximum number of girls between 18 to 19 years of age. This result is in accordance with findings from other studies.^(7, 21) In a study done by Nooh A (2015), the age of menstruating was ranged from 11 to 14 years.⁽²²⁾ While in Alexandria 2004, it was 11.9 ± 0.93 .⁽¹⁹⁾ In Western European countries, the average age at menarche appears to have dropped over the past 150 years from over 16 to under 14 years. In the UK, girls enter puberty around the age of 10 years with a median age at menarche of 12.9 years.⁽¹⁷⁾ In Italy, the mean age at menarche was estimated at 12.4 ± 1.3 years.^{(16), (23)}⁽³⁻⁶⁾ This difference could be attributed to the influence of heredity, environmental influence and nutrition.

The present study demonstrates that the students mean knowledge score was low in pretest, these results coincides with those of other study in Saudi Arabia which revealed same results.⁽²⁶⁾ Also the results were

reported by Said A2017⁽²¹⁾ 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 2017 in India, found that, the majority of the girls was having correct knowledge about menstruation.⁽²⁵⁾ It may be due to increase health awareness among school girls in India and culture differences between India and Egypt. A highly statistically significant difference was observed between pre & post-test, as the students' mean knowledge score was good (7%) in pre-test, compared to almost all of them (99%) in post-test.

The results of the current study showed that the majority of participants knew the normal menarcheal age, and this may be due to the majority of them having had a normal onset of menarche. Such result (94%) is more than the finding of a previous study in Saudi (65%),⁽²⁶⁾ and in Egypt (48%).⁽²⁷⁾ In addition, the majority of participants knew the normal duration and frequency of menstruation. Furthermore, the results indicated that the participants in our study were more knowledgeable than those in another previous study conducted in Nigeria, whereby 10% and 38% knew the normal frequency and duration of menstruation respectively, and 21.6% of Saudi girls⁽²⁸⁻²⁹⁾

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^(30,31) In the present study, only 21% of students in the pre-test, obtained good total score of practice, compared to (94%) in the post-test. The relationship between pre & post-test was found to be highly statistically significant.

In the present study, in the pre-test, washing genitalia with every toilet use; way of disposing pad; removing pubic hair and type of used pads were done correctly & completely by 86%, 86%, 83% & 80% of students respectively in the pre-test, compared to 97%, 96%, 94% & 94% of them respectively in the post-test, there was significant improvement in the menstrual practice. On the other hand, in a study conducted among 664 schoolgirls aged 14-18 years in Mansoura, Egypt by El-Gilany et al the different aspects of personal hygiene were generally found to be poor, such as not changing pads regularly or at night, and not bathing during menstruation with lack of privacy being an important problem.⁽³²⁾

In addition, in the present study highly statistically significant differences were noticed between students' positive beliefs about menstruation in the pre and the post-test in relation to the beliefs that strenuous exercises during menstruation cause bleeding; taking cold fluids during menstruation increases its pain; drinking much water during menstruation reduces abdominal gases; avoiding carbohydrates and fats during menstruation reduces uterine contractions as well as girls should participate in social activities during menstruation. It is contrary to what Alosaimi J. found out in Saudi where 50% of the participants had many restrictions regarding food, drink and activities.⁽³³⁾ This is similar to findings in Egypt and India where girls avoid socialization, religious places and are not allowed to cook. Adolescents observed the above restrictions because they believed it is sinful and claimed that failure to do so will hamper their menses.

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

V. Conclusion & Recommendation

This study concluded that adolescent girls must be educated about menstrual and hygiene practices to improve menstrual hygiene and bring them out of traditional beliefs, misunderstandings and restrictions on menstruation.

Based on findings, the study recommended:

- ☒ Menstrual hygiene and self-care practice guide should be taught by teachers and easily practicable at home by their parents (mothers), sisters and experienced neighbors with a provision of listenable ears to the adolescents girls needs to avoid poor health outcome due to poor self-care practices.
- ☒ Menstrual hygiene and self-care practices should be included in the curriculum of secondary school.
- ☒ Simple booklets regarding menstrual hygiene should be available and easily access in the institute.
- ☒ This study can be replicated with larger subjects in different setting for generalizing the findings

Acknowledgment

The authors show gratitude to all the participants, who volunteered and took their time to give us all the relevant information for the study.

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