



Effect of Health Education Intervention on Knowledge and Practice about reproductive health among Adolescent Female Students

Author

Eman Elsayed Mohammed Elsabagh

Assistant Professor of Obstetrics and Gynecology Nursing

Faculty of Nursing, Zagazig University, Egypt

Email: eman_plus_2010@yahoo.com

Abstract

Adolescence is the most important period of one's Life. It is a fundamental component of an individual's overall health status and a central determinant of quality of life.

Aims of the study: *The aim of this study was to evaluate the effect of health education intervention on knowledge and practice about reproductive health among adolescent female students.*

Research Design: *A quasi-experimental design was utilized for this study.*

Setting: *The study was conducted in Nursing College at Taibah University (Saudi Arabia). Sample a purposive sample was chosen the study comprised of 150 adolescent female students.*

Tools: *Two tools were used in the study, Tool (1): It was consisted of three parts; First part: Included demographic characteristics Second part; Menstrual history. Third part; sources of their information about reproductive health items Tool (2): It was consisted of two parts: Part one assessment knowledge of adolescent females about reproductive health. Part two assessment practices of adolescent females about reproductive health.*

Results: *The overall increase in adequate knowledge improved from 21.3 to 82.7% after the education intervention, with a highly statistically significant difference ($p < 0.0001$). The overall increase in adequate practice improved from 47.3 to 86.7% after the intervention, with a significant difference ($p < 0.0001$).*

Conclusion: *The present study had revealed low level of knowledge and practice about reproductive health among adolescent females. The study also clearly pointed out the impact of health education in improving their knowledge and practice.*

Recommendation: *The study recommended that further education intervention for adolescent females should be applied in all health care centers. Development of in-service training programs for health care providers who take care of adolescent females about issues related to reproductive health.*

Keywords: *Intervention- program, reproductive health, Adolescent females, Knowledge and practices,*

Introduction

Reproductive health defines as a stressful developmental period filled with major changes in physical maturity, sexuality, and cognitive processes, emotional feelings, and relationships with others. The WHO defines reproductive health (RH) as a state of complete physical, mental and social well-being, and not merely the absence of

reproductive disease or infirmity in all matters relating to the reproductive system and to its function and processes^(1,2). Because the adolescent of today is the young married woman of tomorrow and the grandmother there after, it is important to pay attention to reproductive health needs and problems of adolescent females⁽³⁾.

Adolescence is the transition period from childhood to adulthood and is widely recognized as a time of great opportunity. It is also considered as a period with vulnerabilities, in terms of both biological (physical and psychological) and environmental (national and international politics along with influence of family, community, neighbors, peers and schools) aspects ⁽⁴⁾. The period of adolescence divided into three stages; early (10-14 years), middle (15-16 years) and late adolescence (17-21years)⁽⁵⁾. Moreover reproductive health problems are the major cause of death among women aged 15 to 19 years. Although considerable progress has been made in understanding the factors that affect healthy transition into adulthood, many adolescents still lack the support they need for their physical, psychological, as well as social development, including access to information and services ⁽⁶⁾.

Adolescent females constitute about 1/5th of total female population in the world. These years have been recognized as a special period in the life cycle of adolescent females as it requires specific and special attention⁽⁷⁾. This transition phase makes them vulnerable to a number of problems for example, psychosocial problems, general and reproductive health problems, and sexuality related problems. The period of adolescence for females is a period of physical and psychological preparation for safe motherhood. As direct reproducers for future generations, the health of adolescent females influences not only their own health, but also the health of future generation. A vast majority of adolescent females are suffering from reproductive health morbidities⁽⁸⁾. Reproductive health covers all aspects of adolescent health. It is an umbrella concept, consisting of several distinct, yet related issues such as abortion, child birth, sexuality, contraception and maternal mortality. Biological, social, economic, cultural, and behavioral factors play an important role in determination of reproductive health ⁽⁹⁾.

⁽¹⁰⁾Emphasized the importance of reproductive health among adolescents. During adolescence, young people develop their adult identity, move

toward physical and psychological maturity, and become economically independent. The adolescents were not well informed about their biology, reproductive health organ, physical growth as well as their normal growth and development issues. It is at this stage when the young are vulnerable to risks such as unwanted pregnancies, the health risks associated with early pregnancy, unsafe abortions, Sexually Transmitted Infections (STIs), and Human Immuno Virus (HIV). It is essential that adolescents and students know how to make informed choices and must be equipped with adequate knowledge about reproductive health, as well as to develop positive or favorable attitudes so as to adopt safer sexual behaviors. Focusing on adolescents' reproductive health is both a challenge and an opportunity for health care providers⁽¹¹⁾.

Adolescent females often have lack of basic reproductive health information and access to affordable confidential reproductive health services. Public health policies and programs have focused on the sexual and reproductive needs of adolescents, particularly in the developing countries. This is a result of recognition that adolescents constitute large segments of developing countries' populations that they are disproportionately affected by negative reproductive health outcomes and that services for adults are not responsive to the needs of adolescents ^(12, 13).

Some Reproductive Tract Infections (RTIs) can also lead to the risk of other reproductive health problems. Although not proven by scientific researches, it is sometimes found that the bacteria causing Bacterial Vaginosis (BV) is also linked with increased chances of getting HIV. It is also believed that BV can also increase the possibility of some birth related problems such as premature delivery, infections after delivery, and complications after caesarian section or miscarriage ⁽¹⁴⁾. It is a well-known fact that poor menstrual hygiene will lead to the risk of all reproductive tract infections with studies done in different parts of the world. Keeping all these facts in mind the following study was formulated

with an objective to find out the knowledge and practices regarding reproductive health and hygiene, among the university females⁽¹⁵⁾.

A comprehensive adolescent reproductive health program can provide right information at right age. Teachers in colleges often find it difficult to discuss the topics related with reproduction. It is commonly observed that they ask students to read these topics on their own from the text book. They are often unable to break the barrier of hesitation. Parents' position in this regard is more sensitive. They also lack the confidence and skills to address the psychosocial and sexuality related problems of adolescents. Reproductive health education by a health professional has become acceptable for adolescent females. Intervention in the form of health education increases the awareness level among adolescent females⁽¹⁶⁾.

Significant of the study

The adolescent females usually have lack of scientific knowledge and hygienic practice about reproductive health. So, this study was conducted to assess the knowledge & practices levels of adolescent females about reproductive health & to develop a reproductive health education programmes for adolescent females and to evaluate the effectiveness of reproductive health education by health professionals in improving the knowledge, practice of adolescent females about reproductive health.

Aim of the study

The aim of this study is to evaluate the effect of health education intervention on knowledge and practice about reproductive health among adolescent female students.

Research hypotheses

It was hypothesized that health education intervention will improve the knowledge and practice about reproductive health among adolescent female students.

Subjects and Methods

Research design

A quasi-experimental design was used for this study to evaluate the effect of health education intervention about reproductive health among adolescent female students.

Study setting

The study was conducted in Nursing College at Taibah University (Saudi Arabia).

Sample size

The sample size was calculated through EPI info (Epidemiological information system) software version 6 according to the following collected data, the confidence level 95% and a power of study 80%. The estimated sample size was calculated to be 150 female nursing students.

Study subjects

A purposive sample of 150 females nursing students enrolled in the above mentioned settings in the range of age (18-21 years). The actual total number of females nursing students 300 from 500. The sample taken from third and fourth levels' because obstetrics and gynecological courses not included in these academic years.

Tools of data collection

Two tools were used for data collection in the current study:

Tool (1): Questionnaire sheet: was especially designed by the researcher and it consists of three parts as the following:

First part: Included information about demographic characteristics (such as age, marital status, father education, mother's education, family size and socio-economic status).

Second part: Menstrual history of adolescent females (such as age at marriage, age at menarche, length of menstrual cycle, duration of bleeding, and pre-menstrual syndrome)

Third Part: Sources of their information about reproductive health items.

Tool (2) questionnaire sheet for assessment of adolescent females` knowledge and practices it was consisted of two parts

First part: Interview questionnaire sheet for assessment adolescent females` knowledge throughout intervention program included 18 questions and divided to four main parts:-

- Definition, aim and elements of reproductive health. Puberty changes in females, complications related to early pregnancy, Importance of premarital counseling.
- Pregnancy& antenatal care.
- Contraceptives methods, STDS diseases, HIV prevention methods.
- Menstruation & menstrual hygiene.

The Scoring System

The students answers related to knowledge were scored and calculated. According to the answers of female students responses were evaluated using the model key answer sheet previously prepared by the researcher according to literatures review. A scoring for adolescent s' knowledge regarding reproductive health was consisted of given two for complete correct answers, one for incomplete correct answers, while the wrong answer was scored zero. A scoring was given to each question and a total knowledge score that ranges from zero to 19 points was adopted. Total adolescent s' score level for knowledge less than 10 (50%) were classified as poor knowledge, adolescents who had total scores level for knowledge range from 10 - 12 (60%) were described as fair knowledge and who had complete correct answers range from 12 to 26 were described as having good knowledge.

Second Part: was developed to assess practice of adolescent females regarding hygienic practice during menstruation throughout intervention program included 14 questions and divided to five main parts:

- Absorbent material used during the menstrual cycle.

- Know that personal hygiene can prevent problems and pain.
- Frequency of bathing during the menstrual cycle daily.
- Frequency of cleaning external genitalia.
- Restrictions during the menstrual cycle.

Scoring for adolescent`s practice and performance consisted of given 1 mark for correct answer and 0 mark for wrong or no answer. A scoring was given to each question and a total practice score that ranges from zero to 14 points was adopted. Total adolescent s' score level for practice less than 9 (60%) were classified as poor practice. Total adolescent s' score level for practice more than 9 ($\geq 60\%$) were classified as good practice.

1) The total score of each aspect equal 60% or more than → adequate or satisfactory knowledge and practice.

2) The total of each aspect less than 60% →inadequate or unsatisfactory knowledge and practice.

Pilot study

It was carried out on 10 students to ascertain the clarity and applicability of the tools. Those girls who shared in the pilot study were excluded from the main study sample. Data were collected by using a structured interview questionnaire.

Administrative design:

Approval to carry out the study was obtained from responsible authorities at the previously mentioned settings after clarifying the aim of the study to help in the study conduction and facilitate data collection.

Field work

The study was conducted during the period April-October 2016. After taking permission from obtained from Dean of Nursing College in Taibah University (Saudi Arabia), a pre-designed, pre-tested, structured questionnaire was administered to the adolescent females to study their existing level of knowledge and practice regarding reproductive health. The questionnaire included topics concerning on puberty changes,

menstruation, maintaining hygiene during menstruation, regarding ovulation and fertilization, conception, changes during pregnancy, antenatal care, and also on various methods of contraception and STDs. After collection of the questionnaire, health education regarding “reproductive health” was imparted to the adolescent females through lectures with the help of audio-visual aids such as power point presentation using LCD project-tor, video films, charts, posters were used. This was followed by question-answer session to clarify their doubts. the total sample was classified into 8 groups each group ranged from 18- 20 adolescent females, and each group obtained 4 sessions through 2 weeks, each session ranged from 30-60 minutes, first session include, pretest and information about anatomy and physiology of male and female reproductive system, physical changes during and after puberty, menstrual cycle, pregnancy, antenatal care. Second session, include knowledge about various contraceptive methods, STDS Diseases, HIV prevention methods. Third session, include the knowledge about menstruation & menstrual hygiene. Fourth session include hygienic practice during menstruation. After three months, the same questionnaire was again administered to the adolescent females (post-test) to assess the impact of health education.

Validity and reliability

Validity refers to the degree to which an instrument measures what it is supposed to be measuring. In this study, the following procedures were followed to ensure validity. The researcher conducted an extensive literature review and developed the questionnaire. The The questionnaire was formulated and cross-checked by 5expertise in the field of study and has experience in research process (3 experts from community health nursing and 2 experts from obstetrics and Gynecology nursing). It was pre-tested to assess its feasibility and applicability (Reliability test) finally reviewed and corrections made, where necessary.

Ethical consideration

An agreement for participation of the subjects was taken verbally before inclusion and after the aim of the study explained to them. They were given the free will to refuse to participate and they were notified that they could withdraw at any stage of the research. They also were assured that any information taken from them would be confidential and used for the research.

Statistical design

Data were collected, coded, tabulated and analyzed, using the Microsoft Excel version 2010 computer application for statistical analysis. Descriptive statistics was used to calculate percentages and frequencies. X2 test was used to estimate the statistical significant differences. A significant P-value was considered when P less than 0.05 and it were considered.

Table (1): Distribution of study sample according to their socio-demographic characteristics

variables	No	%
Age		
16-18	40	26.7
19-21	110	73.3
Marital status		
Single	140	93.3
Currently Married	10	6.7
Divorced	0	0.0
Father Education		
Illiterate	16	10.7
Primary/preparatory	27	18.0
Secondary	42	28.0
University	65	43.3
mother Education		
Illiterate	10	6.7
Primary/preparatory	34	22.7
Secondary	62	41.3
University	44	29.3
Family size		
≤5	18	12.0
5-7	67	44.7
8-11	52	34.7
+12	13	8.6
Socio-economic status		
Lower	25	16.7
Middle	77	51.3
Upper	48	32.0

Table (1): demonstrates soci-demographic characteristics of the studied group. The table showed that most 73.3% of adolescent females had age from 19 to 21 years. The majority of the

adolescent females were single. Also most of females reported that their parents have secondary and higher education. However, nearly half (41.3%) females reported their mothers have secondary education. Five to seven family members' size was reported by 44.7% of adolescent females. While (32.0%) of female belonged to upper social class.

Table (2): Distribution of study sample according to their history of menstrual cycle

variables	No	%
Age at marriage (yrs.) (total = 10)		
<18	3	30.0
18-21	7	70.0
Age at menarche		
9.5-11.5	31	20.7
11.5-13.5	63	42.0
13.5-16	56	37.3
Length of menstrual cycle N=150		
< 25 days	105	70.0
25-30 days	32	21.3
>30 days	13	8.7
Duration of bleeding		
<7 days	120	80.0
7-10 days	28	18.7
> 10 days	2	1.3
Pre-menstrual syndrome		
Present	143	95.3
Absent	7	4.7

Table (2): distribution of study sample according to their history of menstrual cycle. It was clear that, most (70.0%) of adolescent females reported that they had their age of marriage from 18 to less than 21 years. Also 42 % of adolescent females had age at menarche from 11.5 to 13.5. Concerning length of menstrual cycle, most of adolescents had menstrual cycle less than 25 days. According to duration of bleeding, the majority of adolescent females had menstrual bleeding less than 7 days. While, the majority 95.3% of adolescent females had pre-menstrual syndrome.

Table (3): Adolescent's correct knowledge regarding reproductive health

Knowledge	Pre- test		Post -test		P-value
	NO	%	NO	%	
Definition of reproductive health	56	37.3	140	93.3	<0.001**
aim and elements of reproductive health	16	10.7	115	76.7	<0.0001***
Puberty changes in girls	57	38.0	135	90.0	<0.0001***
First sign of pregnancy is (missed period)	65	43.3	148	98.7	<0.0001***
complications related to early pregnancy	47	31.3	125	83.3	0.0002***
Regular antenatal checkup is essential during pregnancy (agree)	71	47.3	146	97.3	
Importance of premarital counseling	53	35.3	130	86.7	<0.0001***
Importance of premarital examination	64	42.7	124	82.7	<0.0001***
Services provided by premarital examination	68	45.3	118	78.7	<0.001**

Table (3) illustrates correct knowledge regarding reproductive health among adolescent females. (37.3%) adolescent females had satisfactory knowledge about the definition of reproductive health in pretest phase compared to (93.3%) adolescent females in posttest and there was statistically significant difference. Only 10.7% adolescent females had satisfactory knowledge about the aim and elements of reproductive health

in pretest compared to 76.7% adolescent females in posttest. Thirty eighty percent of the adolescents had satisfactory knowledge about pubertal changes compared to 90% of the adolescents in posttest and there was statistical significant difference ($P=0.001^*$). In addition to the majority of adolescent females had satisfactory knowledge about the first sign of pregnancy in posttest and there was statistically significant

difference. Also (31.3%) of adolescent females know the complications related to early pregnancy compared to 83.3% of adolescent females in posttest and there was statistical significant difference ($P=0.001^*$). Majority of adolescent females (97.3%, 86.7% respectively) had satisfactory knowledge about the regular antenatal

checkup is essential during pregnancy and the importance of premarital counseling in posttest and there was statistically significant difference. A significant improvement in female's knowledge about nearly all reproductive health relevant items in pretest compared to posttest.

Table (4): Adolescent's correct knowledge regarding various contraceptive methods, STDS Diseases, HIV prevention methods

knowledge related to various contraceptive methods, STDs, STDS Diseases	Pre-test		Post-test		P-value
	NO	%	NO	%	
contraceptive methods					
Oral contraceptives	55	36.7	133	88.7	<0.001**
Condoms	27	18.0	129	86.0	
IUCD/copper -T	16	10.7	127	84.7	
Tubectomy	2	1.3	11	7.3	
Vasectomy	79	52.7	8	5.3	
Do not know					
Knowledge about STDs					
Sex with multiple partners Can cause STDs(agree)	8	5.3	138	92.0	<0.0001***
Sex with condom is safe sex (agree)	13	8.7	143	95.3	
Knowledge about the Mode of Spread of HIV / AIDS	35	23.3	134	89.3	<0.0001***
Knowledge about prevent AID					
AIDS can be prevented by Condom (agree)	25	16.7	147	98.0	<0.0001***
AIDS can be prevented by Single sex partner(agree)	18	12.0	130	90.0	
AIDS can be prevented by Safe blood(agree)	30	20.0	146	97.3	
AIDS can be prevented by Sterile needles & syringes(agree)	38	25.3	138	92.2	

Table (4): displays correct adolescent's knowledge regarding various contraceptive methods, STDS diseases, and HIV prevention methods. It was observed that their knowledge was poor during pretest and remarkable

improvement was noted following intervention ($p<0.0001$). Also the knowledge of the females regarding STDs especially HIV/AIDS and its prevention. Their knowledge improved remarkably following intervention ($p<0.0001$).

Table (5): Adolescent's correct knowledge regarding menstruation & menstrual hygiene.

Knowledge related to menstruation & menstrual hygiene	Pre-test		Post-test		P-value
	NO	%	NO	%	
Information on anatomy of female reproductive organs and menstruation	110	73.3	148	98.7	<0.001**
Usual interval between 2 Menstrual cycles (1 month)	118	78.7	144	96.0	<0.0001***
Ovulation is release of matured Egg from the ovary	74	49.3	145	96.7	<0.0001***
Usual age of first menses (9-16yrs)	143	95.3	150	100.0	<0.001**
Menstrual hygiene					
Sanitary napkin/clean cloth should be used during menses,& also changed regularly	146	97.3	150	100.0	0.008
Nutrition and other care	86	57.3	134	89.3	<0.001**

Table (5): demonstrate correct knowledge regarding menstruation & menstrual hygiene among adolescent females the table showed that (73.3%, 78.7%, 49.3%) adolescents females respectively had satisfactory knowledge regarding information on anatomy of female reproductive

organs and menstruation, interval between 2 menstrual cycles and ovulation is release of matured egg from the ovary respectively in pretest compared to the majority of adolescent females (98.7%, 96.0%, 96.7%) respectively in the post test. Also the majority of adolescent females

(95.3%) had satisfactory knowledge regarding age of first menses in pretest compared to 100% adolescent females in posttest. Regarding knowledge about menstrual hygiene, the majority of adolescent females (97.3%) had satisfactory knowledge regarding sanitary napkin/clean cloth. should be used during menses, also changed

regularly in pretest compared to 100% adolescent females in posttest. Finally, more than half (57.3%) adolescent females had satisfactory knowledge regarding nutrition and other care in pretest compared to 89.3% adolescent females in posttest.

Table (6): Adolescent's correct self-care practices during menstruation

menstrual hygiene	Pre-test		Post-test		P-value
	NO	%	NO	%	
Perineal hygiene	37	24.7	146	97.3	<0.001**
Underwear & methods of cleaning	119	79.3	140	93.3	<0.001**
Methods of shaving the hair in genital area	109	72.7	143	95.3	<0.001**
Frequency of change	70	46.7	142	94.7	<0.0001***
Exercise during menses	25	16.7	113	75.3	<0.001**
Herbal use / Traditional methods	19	12.7	79	52.7	<0.001**
Fluid intake / Food intake	85	56.7	137	91.3	<0.001**
Medication	65	43.3	91	60.7	<0.001**
Absenteeism / and stay of home during menses	28	18.7	46	30.7	<0.001**

Table (6): illustrated correct self-care practices during menstruation among adolescents. (24.7%) adolescent females had satisfactory perineal hygiene in pretest phase compared to (97.3%) adolescent females in posttest and there was statistically significant difference. Also, the majority of adolescent females (93.3%, 95.3%, 94.7%) respectively had satisfactory practice regarding methods of cleaning underwear, methods of shaving the hair in genital area and frequency of change of underwear respectively in posttest and there was statistical significant difference (P=0.001*). Sixteen point seven of the adolescents had satisfactory practice regarding exercise during menses compared to 75.3% of

adolescent females in posttest and there was statistical significant difference (P=0.001*). As regards to use herbal as traditional methods for relieve menstrual pain, 12.7% adolescent females uses herbal in pretest compared to 52.7% adolescent females in posttest. More than half (56.7%) of adolescent females have hot fluid and food intake in pretest compared to 91.3% adolescent females in posttest with statistically differences. also (43.3%) adolescent females take medication with menstruation compared to 60.7% of adolescent females in posttest. Also 18.7% adolescent females stay of home during menses compared to 30.7% adolescent females in posttest.

Table (7): Adolescent's correct practices of menstrual hygiene

menstrual hygiene	Pre-test		Post-test		P-value
	NO	%	NO	%	
Type of pads used:-					
Sanitary pad	97	64.7	139	92.7	<0.001**
Others	53	35.3	11	7.3	
Number of pads per day					
Single per day	20	13.3	16	10.7	<0.001**
Twice per day	62	41.3	50	33.3	
Three per day	55	36.7	73	48.7	
Four or more per day	13	8.7	11	7.3	
Washing clothes:-					
water with soap	71	47.3	131	87.3	<0.0001***
water only	79	52.7	19	12.7	
Methods of drying					
Expose to the sun	46	30.7	141	94.0	<0.001**
Artificial dry	104	69.3	9	6.0	
Waste dispose of pad					
House dustbin	140	93.3	149	99.3	0.0002***
Throw on road side /garden	9	6.0	1	0.7	
Latrine	1	0.7	0	0.0	

Data given in the table (7) showed the practices during menstruation among adolescent females. In the pretest period, the type of pads used was reported as sanitary pad (64.70%), and others (35.3%) which increased to (92.7%) adolescent females using sanitary pad in posttest period. As regards to number of changed pad/day (36.7%) from adolescent females changed 3 pad/day during the pretest period while increased to (48.7%) in the posttest phase. During the pretest phase, (52.7%) adolescent females washed their

cloths only with water and (47.3%) washed with soap and water. In the posttest period, the figures rose with (87.3%) females washing their cloths with soap and water. For drying the cloths, in the pretest period, only (30.7%) adolescent females sun dried their cloths which increased to (94%) in the posttest phase. With regard to the final disposal off the pads, in the pretest period, (93.3%) females threw it in the dustbin, and 9 (0.6%) females threw it by the roads.

Fig. (1) Total knowledge score regarding reproductive health

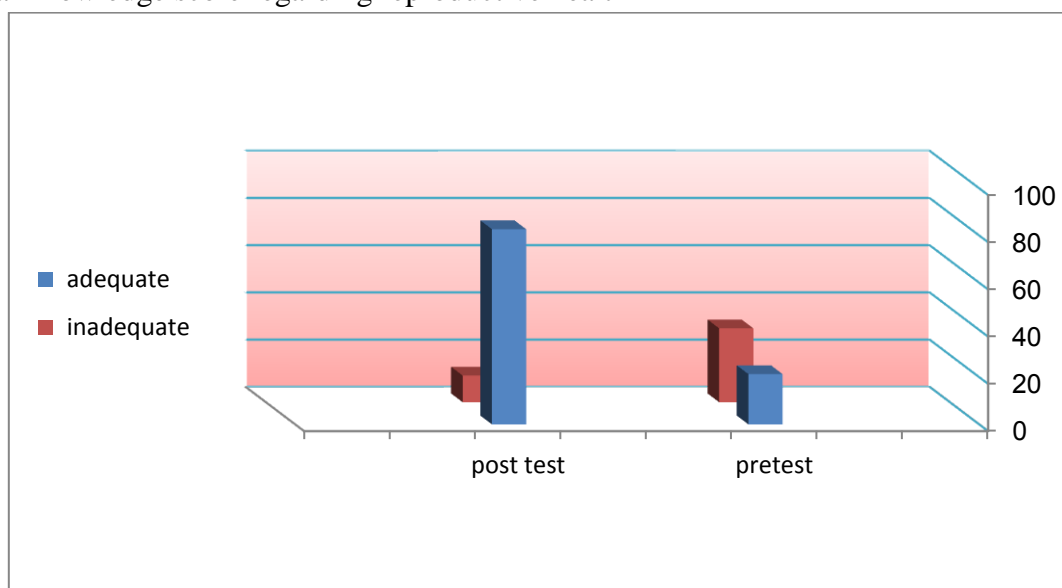


Fig. (2) Total practices score regarding reproductive health.

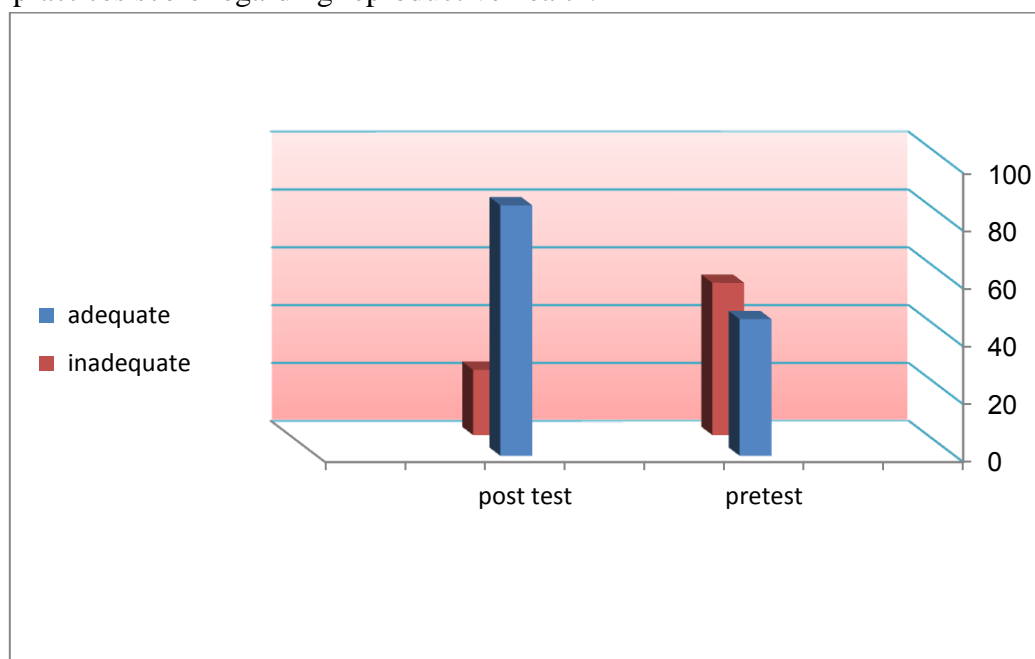
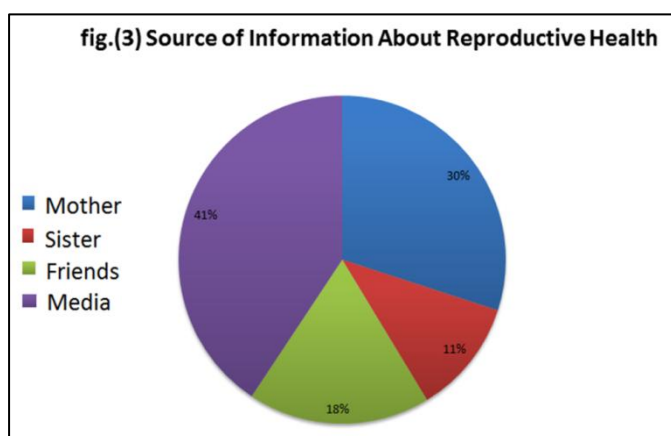


Figure (1 and 2) summarizes the total score of adolescent female's knowledge and practices regarding reproductive health. The majority (86.7% and 82.7% respectively) females had higher percentage of satisfactory knowledge and practice regarding menstruation at the posttest than the pretest (21.3.0% and 47.3% respectively). The difference observed was statistically significant (p-value <0.001).

The source of information about reproductive health was shown in Figure (3). More than one third (41%) adolescent females reported that their mother was the main source of information about reproductive health followed by media (30%), friends (18%), and finally sisters (11%).



Discussion

Adolescence is the period when major physical changes take place and secondary sexual characteristics appear. Therefore, accurate and adequate reproductive health knowledge at this age is crucial for developing proper practice and behavior regarding reproductive health for the future. In reality, adolescents are poorly informed about their own bodies and health. Moreover, the information available to them is most often incomplete, inadequate, and confusing⁽¹⁷⁾. Proper Adolescent Reproductive Health (ARH) education can provide adolescents with culturally relevant, age-appropriate and scientifically accurate information. This can give adolescents the opportunity to explore their knowledge, and values on reproductive health (RH) as well as in practicing those skills while taking decisions

related to their personal lives.⁽¹⁸⁾ So, this study evaluated the effect of health education by health professionals on adolescent females' knowledge and practice towards reproductive health.

The current study revealed that the most of adolescent's females had age from 19 to 21 years, concerning the marital status; the majority of the adolescent females were single. Similar study conducted by⁽¹⁹⁾ reported that the mean age of the respondents was 17 ± 0.752 . Similarly study conducted⁽²⁰⁾ highlighted that the mean age of adolescents was 16.75 ± 1.25 years of being majority in the age group of 15-17 years. Also⁽²¹⁾ found that majority (87.2%) of the participants belonged to the age group of (16-17.9) years.

The present study revealed that most of females reported that their parents have secondary and higher education. However, nearly half of the adolescent females reported their mothers have secondary education. This result comes in disagreement with⁽²²⁾ who addressed that the majority of the mothers of research participants have attained primary education (40.3%) followed by secondary education (26.4%), illiterate (21.5%) and so on. Similarly, the study conducted by⁽¹⁹⁾ reported that majority of the mothers of adolescent females have attained tertiary education (47.5%) followed by secondary (30.7%), primary (14.9%) and so on. Also⁽²¹⁾ who mentioned that majority (84.6%) of their parents were literate.

In the present study, most of adolescent females reported that they had their age of marriage from 18 to less than 21 years. Also nearly half of adolescent's females had age at menarche from 11.5 to 13.5. The present results agreed with⁽²³⁾ found that the mean age of marriage was 22.1 ± 3.0 and 22.4 ± 2.5 years of the middle and late adolescents respectively and there was statistical significance. This goes in line with⁽²⁰⁾ reported that the mean age at menarche was found to be 13.62 ± 0.913 years. Similarly,⁽²⁴⁾ found that the mean age of menarche in the adolescent females was 12.85 ± 0.867 years. These results were supported by,⁽²⁵⁾ shown that 64.5% adolescent females were aware about menstruation prior to the attainment of menarche.

Concerning length of menstrual cycle, most of adolescents had menstrual cycle less than 25 days. According to duration of bleeding, the majority of adolescent's females had menstrual bleeding less than 7 days. While, the majority of adolescent females had pre-menstrual syndrome. On the same line,⁽²⁶⁾ highlighted that only 29 (24.2%) of the subjects had a normal length of cycle (i.e. 25-30 days), and around 85 (71%) had a menstrual cycle length of less than 25 days. Duration of bleeding was found to be normal in 75 (79.2%) girls. Twenty three girls (19.2%) had bleeding for 7-10 days and 2 (1.7%) were found with dysfunctional uterine bleeding (i.e. more than 10 days of bleeding). A relatively a very high percentage (95%) was suffering from PMS. Another study conducted by ⁽²⁷⁾ noticed that the majority 75% of the respondents had menstrual duration between 5 to 7 days, followed by 3 days 18.5% and more than 7 days 6.6%. Similarly, a study conducted by (14) who pointed out that of total 131 subjects who were having menstruation, 78.6% subjects reported their duration of menstruation between 0 to 6 days while rest of them reported their duration between 7 to 12 days.

As regards the correct knowledge of adolescent females about definition, aim and elements of reproductive health and pubertal changes, importance of premarital counseling before and after the intervention program. The overall percentage of adequate knowledge related to all reproductive health relevant items improved after the intervention program with a highly significant difference. This goes in line with⁽²¹⁾ who shows that females had reasonably good knowledge regarding certain aspects of reproductive health. This is probably due to the better literacy rate that is seen in spite of being a rural area. Various studies across the world have also shown the effectiveness of interventions in increasing the knowledge on reproductive health. Also⁽²⁸⁾ found that there is lack of knowledge about reproductive health among the adolescents from both mentoring and non-mentoring schools; especially, they have very poor knowledge on puberty and pubertal physical changes. Another study conducted by

⁽²⁹⁾who clarified that the low knowledge about reproductive health (55.2%) was the main barriers of the female youth reproductive health aim.

Regarding the correct knowledge of adolescent females about first sign of pregnancy, complications related to early pregnancy, and antenatal checkup, before and after the intervention program. The overall percentage of adequate knowledge related to pregnancy & antenatal care improved after the intervention program with a significant difference. Similar study conducted by⁽²¹⁾ who stressed that, the knowledge regarding missed period as the first sign pregnancy was initially known to only 61.2% of the students, but most of the adolescent females (98%) were aware of the importance of regular antenatal checkups. The intervention significantly improved this knowledge to 96.5% following the intervention. Another study conducted by⁽³⁰⁾ who evaluated the effect of health education by health professionals on adolescent females' knowledge and attitudes towards reproductive health. Remarkable improvement was seen with relation to knowledge of participants about pregnancy, contraception and these studies have shown the effectiveness of intervention in increasing the knowledge of reproductive health.

The current study revealed that there was improvement in knowledge of adolescent females related to various methods of contraception, STDS diseases, the mode of spread of HIV / AIDS, prevented methods of AID after the intervention program. These findings in accordance with ⁽²¹⁾ who found that the participants were not aware about the various methods of contraception during the pretest, but significant improvement was noted following intervention. It is observed that their knowledge regarding the temporary methods improved to a great extent [(84-89) % from (11.1-35% at pretest)] after intervention. On the same line⁽³¹⁾ suggested that other STDs known to females were syphilis and gonorrhoea (about 10% each). Most of the females (78.5%) knew that sexual transmission is the commonest mode of transmission of HIV, followed by infected needle, syringe and blood (60.5%). However their

knowledge about ways to prevent HIV & other STDs was poor. Only 3.8% to 11.3% did mention about use of condom and mutual faithful relationship to prevent HIV and other STDs. About 17% students had one or the other misbelieve regarding the transmission and prevention of HIV. Moreover,⁽³²⁾ who clarified that the majority of the participants of this study had very poor knowledge about STD, 60% of them had never heard about AIDS, 48% did not know the route of transmission

The findings of the present study showed that the adolescent females had satisfactory knowledge regarding information on anatomy of female reproductive organs and menstruation, interval between 2 menstrual cycles and ovulation is release of matured egg from the ovary. Regarding knowledge about menstrual hygiene, the majority of adolescent females had satisfactory knowledge regarding sanitary napkin/clean cloth should be used during menses also changed regularly, the overall percentages of correct knowledge related to menstruation & menstrual hygiene improved after the intervention program with a highly significant difference. This agreement with⁽²¹⁾ who found almost half the respondents was not aware of the term ovulation. Their knowledge regarding menstruation and menstrual hygiene improved significantly from (77.2% to 95.6%) and (91.8% to 100%) respectively after intervention. Another study conducted by⁽¹⁶⁾ who noticed that the students had a good knowledge regarding age at first menses, interval between 2 menstrual cycles at pretest. About 49.5% of the students were not aware about ovulation. Their knowledge about ovulation improved from 49.5% to 96.1% ($p < 0.001$), and regarding menstruation & menstrual hygiene, improved significantly from 78.3% to 96.4% and from 92.5% to 98.9% respectively after intervention ($p < 0.005$). The intervention significantly improved participants' knowledge ($p < 0.001$).

As regard the self-care practices, there was lack of practices care of adolescent females regarding perineal hygiene, methods of cleaning underwear, methods of shaving the hair in genital area and

frequency of change of underwear respectively before intervention, these percentages changed after the intervention program, with an extremely statistically significant difference. The overall increase in adequate practices improved after the intervention program. These results are congruent with⁽²⁶⁾ who concluded that 96 females (80%) had personal hygiene especially during the monthly periods. In spite of the large percentage of females being aware of this fact, only 10 (8.3%) females took bath daily. On the other hand, 24 females (20%) were found with the habit of bathing only after their periods were over. The frequency of cleaning external genitalia during menstruation was found to be satisfactory, among around 74 (62%) of the subjects. While results of the study done by⁽³³⁾ reveal that self-care practice during menstruation includes: regular washing of under wears (88.5%), regular changing of under wear (77.0%), shaving the genital area (65.1%), regular bath (60.8%), use of sanitary pads (53.6%). Moreover results of the study done by⁽³⁴⁾ found that self-care practices during menstruation includes: regular washing of under wears (88.5%), regular changing of under wear (77.0%), shaving the genital area (65.1%), regular bath (60.8%), use of sanitary pads (53.6%), use of deodorant (45.9%) and relaxation at home (30.1%) but however, this indicate a sub-optimal level of care during menstruation.

As regards to use herbal as traditional methods for relieve menstrual pain, 12.7% adolescent females uses herbal in pretest compared to 52.7% adolescent females in posttest, also (43.3%) adolescent females take medication with menstruation compared to 60.7% of adolescent females in posttest. Also 18.7% adolescent females stay of home during menses. This result coincided with⁽³⁵⁾ revealed that around half of females miss between 1-4 days of school each month due to painful periods or embarrassment and 39% reported reduced performance. Also⁽²⁶⁾ shows only 12.5% college absenteeism and preferable stay at home.

The results of the present study revealed that majority of adolescent females using sanitary pad

in posttest phase. As regards to number of changed pad/day, one third of adolescent females changed 3 pad/day in the posttest phase. More than half of adolescent females washed their cloths only with water and (47.3%) washed with soap and water. In the posttest phase, which increase to (87.3%) females washing their cloths with soap and water in the posttest with significant difference. For drying the cloths, in the pretest period, only (30.7%) adolescent females sun dried their cloths which increased to (94%) in the posttest phase. With regard to the final disposal off the pads, in the pretest period, majority of females threw it in the dustbin, 9 girls threw it by the roads. The overall percentages of correct menstrual practice among adolescent females are increase after the intervention program. This agreement with ⁽²⁶⁾ who suggested that the majority of the study participants (98.3%) used only readymade sanitary pads as the absorbent material during their menstrual periods. Remaining 1.7% used other materials such as homemade cotton pads. On the same line⁽²²⁾ reported that 47.2% of the females changed pad twice a day followed by thrice(28.1%), once (11.6%), four times and more than four times being equal in percentage(6.6%) during pretest, whereas in posttest majority(89.4%) changed pad thrice followed by twice(7.3%) and four times(3.3%), (P-value=<0.001). Also the females have correct practice of drying the cloth used as pad was practiced by 23.62 % during pretest which increased by 100% in posttest (p-value=<0.001). Moreover, ⁽¹⁹⁾ showed that there was significant increase from pre to post intervention in the use of sanitary pad i.e. from 56.4% to 90.8%. Similar findings was observed in the study of ⁽³⁶⁾ who addressed that there was significant increase in the use of sanitary pad after receiving training on menstrual hygiene i.e. from 61.7% to 75.1%. Hygiene is an important aspect especially during menstruation. Proper understanding of menarche and personal hygiene during menstruation significantly influences the reproductive health of adolescents. Result was similar to ⁽³⁷⁾ who noticed that 47.2% girls change

their pad only twice a day in the pretest phase while in the post test, it decreased to 7.3%, there by showing improved menstrual hygiene and practice following health education. With regard to final disposal of pad, in the pretest period, 66.7% girls threw it in the dustbin, 19.8% girls burnt it, 10.2% females drained it and remaining of them threw it by the roads. In the posttest period, 97.3% females reported that they threw the used pads in the dustbin.

Regarding the source of information about reproductive health, More than one third adolescent females reported that their mother was the main source of information about reproductive health followed by media, friends, and finally sisters. This result coincided with ⁽²⁶⁾ who stressed that the source of information regarding different aspects of reproductive health and hygiene was highest from mothers (47.5%), followed by sisters (18.3%), friends and school (16.7%) each and lastly media (0.8%). On the same line ⁽²²⁾ describes the distribution of participant according to source of information about reproductive health, majority of females heard from mothers i.e. 71%, followed by friends i.e. 19% and rest from teacher i.e. 10%.

Conclusion

The present study had revealed low level of knowledge of adolescent girls regarding reproductive health, various contraceptive methods, STDS diseases, HIV prevention methods, also there is low level of practice of adolescent girls regarding menstrual hygiene. The study also clearly points out the impact of health education in improving their knowledge and practices. It will increase the awareness and empower the female youth to protect themselves from STD/AIDS and various other related health problems.

Recommendations

- 1- Early education and information sharing for adolescents' information service providers: the parents, teachers, community, health staff, and media, on adolescent health by using different

education programmes for improving knowledge and practice related to reproductive health.

- 2- Educational strategies could vary from the conduct of seminars, symposia, lectures, group discussions, experiential learning, film showing to improve the adolescent ' level of knowledge especially in the areas of male and female sexuality, STDs and methods of contraception.
- 3- It is important to educate adolescents about issues related to menstruation, so that they can safeguard themselves against various infections and diseases. The data of the study can be used for planning programmes, making new policies for improving the level of information especially, for adolescent girls.

References

1. WHO (2008): The Reproductive Health Library (RHL), Geneva, Switzerland, World Health Organization. Available at apps.who.int/rhl/en/index.html.
2. Hall, Kelli Stidham, Caroline Moreau, James Trussell (2012): "Determinants Of and Disparities in Reproductive Health Service Use among Adolescent and Young Adult Women In The United States, 2002-2008." *American Journal of Public Health* 102.2 359- 367. Academic Search Premier. Web. 7 Nov. 2012.
3. WHO (2013): Child and adolescent health and development, WHO report, 18 July Available from:www.searo.who.int/entity/child_adolescent/en
4. Blum R, Bastos F, Kabiru C, Le L (2012): Adolescent health in the 21st century. *The Lancet*. [Oct 25]; 379:14–5. Available from:<http://www.thelancet.com/pdfs/journals/lancet/PIIS0140673612604073.pdf>
5. Esere OM (2008): Effect of sex education programme on at-risk sexual behavior of school-going adolescents in Ilorin, Nigeria, *African Health Sci*. Jun 2008; 8(2): 120–125.
6. Simona R & John K (2009): Knowledge, Attitude and Practices Study on Reproductive Health among Secondary School Students in Bolgatanga, Upper East Region, Ghana *African Journal of Reproductive Health* Vol 13 No 4 December.
7. Balasubramanian P (2011): Health Needs of Poor Unmarried Adolescent Girls. A Community-based Study in Rural Tamil Nadu. A Draft Paper from Rural Women's Social Education Centre, Tamilnadu. From <http://www.ruwsec.org/research.php>.
8. Agrawal S, Fatma A, Singh CM (2007): A study of knowledge and attitude of adolescent girls towards reproductive health and related problems. *Indian J Prev Soc Med*, 38(1, 2): 36-41.
9. Sadana Ritu (2002): Definition and measurement of reproductive health. *Bulletin of the World Health Organization*, 80(5).
10. Njau, Wango I, Roho E, Khama A (2008): A Report of a Baseline Assessment for Adolescent Reproductive Health Initiative in Jinja District of Uganda. Available at www.popcouncil.org/pdfs/FRONTIERS/F_R_FinalReports/Bangladesh_Youth.pdf
11. Das, Bhupon, Ray, Shery I (2007): Adolescent male reproductive health: awareness and behavior among peri-urban and rural boys in West Bengal, India. *International Journal of Men's Health*. 6, (2), 19,79.
12. Erulkar, Annabel (2004): Behavior change evaluation of a culturally consistent reproductive health program for young Kenyans. *International Family Planning Perspectives*, 30 (2), 58-67.
13. Remaneses, Maria Sarah (2007): Adolescent Sexual and Reproductive Health. Retrieved July 15, available at www.docstoc.com/

- docs/26284051/Philippines-Country-Progress-Report.
14. Sommer M (2010): Utilizing participatory and quantitative methods for effective menstrual hygiene management related policy and planning. Paper for the UNICEF-GPIA Conference, New York. Available from: <http://www.sswm.info/content/menstrual-hygiene-management>
 15. Bobhate PS, Shrivastava SR (2011): A cross sectional study of knowledge and practices about reproductive health among female adolescents in an urban slum of Mumbai. *J Family Reproductive Health*; 5(4):117-24.
 16. Malleshappa K, Shivaram K, Nandini C (2011): Knowledge and attitude about reproductive health among rural adolescent girls in Kuppammandal: An intervention study. *Biomedical Research*; 22 (3): 305-310.
 17. Barkat&Majid, (2003): Adolescent Reproductive Health In Bangladesh: Status, Policies, Programs and Issues. Policy Project, USAID. Available from:http://www.policyproject.com/pubs/countryreports/ARH_Bangladesh.pdf
 18. Ecker N, Kirby D, Gordon P (2009): International Technical Guidance on Sexuality Education: An evidence-informed approach for schools, teachers and health educators. UNESCO. Available from:http://www.observatori.apfcib.org/i_bd/upload/DirectriusUNESCO_education_sexual.pdf
 19. Aniebue U U, Aniebue NP, Nwankwo O T (2009): The impact of pre-menarcheal training on menstrual practices and hygiene of Nigerian school girls. *Pan Africa Medical Journal*; 2(9)(16).
 20. Esimai O A, Esan G O (2010): Awareness of menstrual abnormality amongst college students in urban area of Ile-Ife, Osun State, Nigeria. *Indian J Community Med*; 35:63-6(17).
 21. AnkurBarua (2010): Effectiveness of Reproductive Health Education in Adolescent, Rural School Girls of UdupiTaluk, Karnataka. *JIMSA* October - Vol. 23 No. 4.
 22. Pokhrel S, Mahantashetti N, Angolkar M (2014): Impact of Health Education on Knowledge, Attitude and Practice Regarding Menstrual Hygiene among Pre University Female Students of a College Located in Urban Area of Belgaum. *IOSR Journal of Nursing and Health Science (IOSR-JNHS)* e-ISSN: 2320-1959.p-ISSN: 2320-1940 Volume 3, Issue 4 Ver. PP 38-44 www.iosrjournals.org www.iosrjournals.org 38 | Page.
 23. Lamadah MS, Hoda A M, Sahar M (2015): Knowledge, attitude and practices of adolescent females regarding reproductive health at makkah aMukaramah,4 *Life Science Journal*;12(3).
 24. Thakre BS, Thakre SS, Reddy M, Rathi N, Pathak K, Ughade S (2011): Menstrual Hygiene: Knowledge and Practice among Adolescent School Girls of Saoner Nagpur District. *Journal of Clinical and Diagnostic Research*. October; 5(5): 1027-1033 P(36).
 25. Juyal R, Kandpal SD, Semwal J, Negi KS (2012): Practice of menstrual hygiene among adolescent girls in a district of Uttarakhand. *Indian Journal of Community Health*.; 24(2):124-128(28)
 26. Bano RA, Fatima AA (2015): Study of Knowledge and Practice of University Females Regarding Reproductive Health and Hygiene in Hail, Saudi Arabia *International Journal of Women's Health and Reproduction Sciences* Vol. 3, No. 1, 31-39 ISSN 2330-445610.15296/ijwhr.06doi <http://www.ijwhr.net>
 27. Bayray A (2012): Menstrual Perceptions and Preparation of Rural Adolescent Females in Tigray, North Ethiopia.

- Universal Journal of Education and General Studies.; 1(1) pp. 009-016.
28. Gani M, Ahmed S (2012): Growing up and reproducing: Knowledge and Practices of Young People in Bangladesh. Adolescents and Youths in Bangladesh. Monograph . Research and Evaluation Division, BRAC; [cited 2012 Dec 27];(31):73–96. Available from:
http://www.bracresearch.org/monographs/mono_31.pdf#page=80
29. Fatemeh BA, Seyed AT, Fatemeh H Z, Malihe SA, Nazafarin HO (2013): Evaluation of Female Youth Educational Needs about Reproductive Health in Non-Medical Students in the City of Qom Journal of Family and Reproductive Health jfrh.tums.ac.ir .Vol. 7, No. 2.
30. Gupta N, Mathur AK, Singh MP, Saxena NC (2004): Reproductive health awareness of school going unmarried adolescents. Indian J Pediatr;71:797-801.
31. Verma BP, Bhalani KD, Pandya CM, Shah HM, Ramanuj VA, Singh MP (2011): Reproductive health awareness and behavior of adolescent girls of Bhavnagar (Gujarat). Indian J. Prev. Soc. Med Vol. 42 No.1
32. Uddin MJ, Choudhury AM (2012): Reproductive health awareness among adolescent girls in rural Bangladesh. Asia-Pacific journal of public health / Asia-Pacific Academic Consortium for Public Health [Internet]. [Cited 2012 Dec 26]; 20 (2):117–28. Available from:
<http://www.ncbi.nlm.nih.gov/pubmed/19124305>
33. Adika, V., Ayinde M. and Jack-Ide I (2013): Self-care practices of menstrual hygiene among adolescents school going girls in Amassoma Community, Bayelsa State, international journal of nursing and midwifery, Vol. 5(5), pp. 99-105.
34. Ray S, Dasgupta A (2012): Determinants of Menstrual Hygiene among Adolescent Girls: A multivariate analysis. Natl. J. Community. Med. 3(2):294-301.
35. Sarah House S, Mahon T, Cavill S (2012): Menstrual hygiene matters: A resource for improving menstrual hygiene around the world. 1st ed. water aid resources; p.22-37.
36. Dongre AR, Deshmukh PR and Garg BS (2007): The Effect of Community-Based Health Education Intervention on Management of Menstrual Hygiene among Rural Indian Adolescent Girls. World Health & population; 9(3): 48-54, P(32).
37. Water Aid (2010): Menstrual hygiene in South Asia; A neglected issue for WASH (water, sanitation and hygiene) programmes.