Health Education Intervention on Knowledge and Practices about Reproductive Health among Adolescent Females Students

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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 females 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 females students.

Tools: Two tools were used in the study, Tool (1): It was consisted of three parts; First part: Included demographic characteristics Second part; History about reproductive profile. 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 practice 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 practices 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 girls about issues related to reproductive health.

Keywords: Intervention-program, reproductive health, Adolescent girls, 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. The period of adolescence divided into three stages; early (10-14 years), middle (15-16 years) and late adolescence (17-21 years). 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.

Adolescent girls 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 girls as it requires specific and special attention. 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 a girl is a period of physical and psychological preparation for safe motherhood. As direct reproducers for future generations, the health of adolescent girls influences not only their own health, but also the health of future generation. A vast majority of adolescent girls are suffering from reproductive health morbidities.

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, cultural, economical and behavioral factors play an important role in determination of reproductive health. 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 adolescent reproductive health is both a challenge and an opportunity for health care providers.

Adolescents often lack 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.

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. 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 girls. Intervention in the form of health education increases the awareness level among adolescent girls (16).

Significant of the study
The adolescent female 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 girls about reproductive health & to develop a reproductive health education programmes for adolescent girls and to evaluate the effectiveness of reproductive health education by health professionals in improving the knowledge, practices of adolescent girls about reproductive health.

Aim of the study
The aim of this study is to evaluate the effect of health education intervention on knowledge and practices about reproductive health among adolescent females students

Research hypotheses
It was hypothesized that health education intervention will improve the knowledge and practices about reproductive health among adolescent female’s 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 females 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) soft ware 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 level s' because obstetrics and gynecological courses not included in these academic years.

Exclusion criteria
1. Nursing students (matinee) from fifth, sixth, seventh and eighth levels' because the curriculum of obstetrics and gynecological courses included in these academic years.
2. Nursing students (bridge) at all academic level because these students studied obstetrics and gynecological courses before.

Tools of data collection
Two tools were used for data collection in the current study:
Tool (1): The Self –Administered Questionnaire: was especially designed by the researchers and it consists of three parts as the following:
First part: Included information about demographic characteristics (such as marital status, mother's education, father education, family size and socio-economic status)

Second part: History of adolescent females regarding menstrual cycle (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 girls, complications related to early pregnancy, Importance of premarital counseling
- pregnancy & antenatal care
- Contraceptives methods, STDS Diseases, HIV prevention methods
- menstruation & menstrual hygiene

Questions were scored as followed 1 marks for correct answer and 0 marks for wrong or no answer. Summation of all questions including knowledge (18 marks), regarding practice (14 marks) and then cut acquired into two groups as follow:

1) The total score of each aspect equal 60% or more than → adequate or satisfactory knowledge and practice
2) The total score of each aspect less than 60% → inadequate e or unsatisfactory knowledge and practice

Second Part: was developed to assess practices of adolescent females regarding hygienic practices 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

The scoring system for women practices and performance consisted of given1 marks for correct answer and 0 marks for wrong or no answer. The higher scores indicated a higher level of practices. Those score classified as:

- Unsatisfactory (< 60 %)
- Satisfactory (60 %)

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 practices 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, 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 practices 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
The questionnaire was translated into Arabic, and then reviewed by 5 experts (3 experts from community health nursing and 2 experts from obstetrics and Gynecology nursing) who conducted face and content validity of all item. All recommended modifications were performed. Degree of reliability alpha precision 88% of the study sample.

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 was 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 adolescents girls had age from 19 to 21 years. The majority of the adolescents girls were single. Also most of girls reported that their parents have secondary and higher education. However, nearly half (41.3%) girls reported their mothers have Secondary education. Five to seven family members size was reported by 44.7% of adolescents girls. While (32.0%) of girls 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%) of adolescents girls reported that they had their age of marriage from 18 to less than 21 years. Also 42 % of adolescents girls 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 adolescents girls had menstrual bleeding less than 7 days. While, the majority 95.3% of adolescents girls 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 check up 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. (37.3%) adolescent girls had satisfactory knowledge about the definition of reproductive health in pretest phase compared to (93.3%) adolescent girls in post test and there was statistically significant difference. Only 10.7% adolescent girls had satisfactory knowledge about the aim and elements of reproductive health in pretest compared to 76.7% adolescent girls in post test. Thirty eighty percent of the adolescents had satisfactory knowledge about pubertal changes compared to 90% of the adolescents in post test and there was statistical significant difference (P=0.001*). In addition to the majority of adolescent girls had satisfactory knowledge about the First sign of pregnancy in post test and there was statistically significant difference. Also (31.3%) of adolescents know the complications related to early pregnancy compared to 83.3% of adolescents girls in post test and there was statistical significant difference (P=0.001*). Majority of adolescents (97.3, 86.7% respectively) had satisfactory knowledge about the regular antenatal check up is essential during pregnancy, and the importance of premarital counseling in post test and there was statistically significant difference. a significant improvement in girls knowledge about nearly all reproductive health relevant items in pre-test compared to post-test.
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 |
|---------------------------------------------------------------|----------|-----------|---------|
| contraceptive methods                                         | NO %     | NO %      |         |
| Oral contraceptives                                           | 55       | 133       | 88.7    | <0.001** |
| Condoms                                                       | 27       | 129       | 86.0    |          |
| IUCD/copper –T                                                 | 16       | 127       | 84.7    |          |
| Tubectomy                                                     | 2        | 11        | 7.3     |          |
| Vasectomy                                                     | 79       | 8         | 5.3     |          |
| Do not know                                                   |          |           |         |          |
| Knowledge about STDs                                          |          |           |         |          |
| Sex with multiple partners Can cause STDs(agree)              | 8        | 138       | 92.0    | <0.0001*** |
| Sex with condom is safe sex (agree)                           | 13       | 143       | 95.3    |          |
| Knowledge about the Mode of Spread of HIV / AIDS              | 35       | 134       | 89.3    | <0.0001*** |
| Knowledge about prevent AIDS                                  |          |           |         |          |
| AIDS can be prevented by                                      | 25       | 147       | 98.0    |          |
| Condom (agree)                                                |           |           |         |          |
| AIDS can be prevented by                                      | 18       | 130       | 90.0    | <0.0001*** |
| Single sex partner(agree)                                     |           |           |         |          |
| AIDS can be prevented by                                      | 30       | 146       | 97.3    |          |
| Safe blood(agree)                                             |           |           |         |          |
| AIDS can be prevented by                                      | 38       | 138       | 92.2    |          |
| Sterile needles & syringes(agree)                             |           |           |         |          |

Table (4) displays correct adolescent’s knowledge regarding various contraceptive methods, STDS diseases, HIV prevention methods. It was observed that their knowledge was poor during per-test and remarkable improvement was noted following intervention (p<0.0001). Also the knowledge of the participants 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 |
|---------------------------------------------------------------|----------|-----------|---------|
| Information on anatomy of female reproductive organs and menstruation | 110      | 148       | 98.7    | <0.001** |
| Usual interval between 2 Menstrual cycles (1 month)           | 118      | 144       | 96.0    | <0.0001*** |
| Ovulation is release of matured Egg from the ovary            | 74       | 145       | 96.7    | <0.0001*** |
| Usual age of first menses (9-16yrs)                           | 143      | 150       | 100.0   | <0.001** |
| Menstrual hygiene                                              |          |           |         |          |
| Sanitary napkin/clean cloth should be used during menses, & also changed regularly | 146      | 150       | 100.0   | 0.008    |
| Nutrition and other care                                       | 86       | 134       | 89.3    | <0.001** |

Table (5) demonstrate correct knowledge regarding menstruation & menstrual hygiene among adolescent girls. The table showed that (73.3%, 78.7%, 49.3%) adolescents girls 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 adolescents girls (98.7%, 96.0%, 96.7%) respectively in the post test. Also the majority of adolescents girls (95.3%) had satisfactory knowledge regarding age of first menses in pretest compared to 100% adolescents girls in posttest. Regarding knowledge about menstrual hygiene, the majority of adolescents girls (97.3%) had satisfactory knowledge regarding sanitary napkin/clean cloth should be used during menses, also changed regularly in pretest compared to 100% adolescents girls in posttest. Finally, more than half (57.3%) adolescents girls had satisfactory knowledge.
regarding nutrition and other care in pretest compared to 89.3% adolescents girls 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) illustrates correct self care practices during menstruation among adolescent. (24.7%) adolescent girls had satisfactory Perineal hygiene in pretest phase compared to (97.3%) adolescent girls in post test and there was statistically significant difference. Also, the majority of adolescents girls (93.3%, 95.3%, 94.7%) respectively had satisfactory practices regarding methods of cleaning underwear, methods of shaving the hair in genital area and frequency of change of underwear respectively in post test and there was statistical significant difference (P=0.001*). Sixteen point seven of the adolescents had satisfactory practices regarding exercise during menses compared to 75.3% of adolescents girls in post test and there was statistical significant difference(P=0.001*). As regards to use herbal as traditional methods for relieving menstrual pain, 12.7% adolescent girls uses herbal in pretest compared to 52.7% adolescent girls in post test. More than half (56.7%) of adolescent girls have hot fluid and food intake in pre test compared to 91.3% adolescent girls in post test with statistically differences. also (43.3%) adolescent girls take medication with menstruation compared to 60.7% of adolescent girls in post test. Also 18.7% adolescent girls stay of home during menses compared to 30.7% adolescent girls in post test.

**Table (7):** Adolescent’s correct practice of menstrual hygiene

| menstrual hygiene                                      | Pre-test       | Post-test       | P-value  |
|---------------------------------------------------------|----------------|----------------|----------|
|                                                         | NO | %       | NO   | %    |         |
| Type of pads used:-                                     |    |         |      |      |<0.001** |
| Sanitary pad                                            | 97 | 64.7    | 139  | 92.7 |         |
| Others                                                  | 53 | 35.3    | 11   | 7.3  |         |
| Number of pads per day                                  |    |         |      |      |<0.001** |
| Single per day                                          | 20 | 13.3    | 16   | 10.7 |         |
| 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:                                       |    |         |      |      |<0.0001***|
| water with soap                                         | 71 | 47.3    | 131  | 87.3 |         |
| water only                                              | 79 | 52.7    | 19   | 12.7 |         |
| Methods of drying                                       |    |         |      |      |<0.001** |
| Expose to the sun                                       | 46 | 30.7    | 141  | 94.0 |         |
| Artificial dry                                          | 104| 69.3    | 9    | 6.0  |         |
| Waste dispose of pad                                    |    |         |      |      |0.0002***|
| House dustbin                                           | 140| 93.3    | 149  | 99.3 |         |
| 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 adolescents girls. In the pre-test period, the type of pads used was reported as sanitary pad (64.70%), and others (35.3%) which increased to (92.7%) adolescent girls using sanitary pad in post-test period. As regards to number of changed pad/day (36.7%) from adolescents girls changed 3 pad/day during the pre-test period while increased to (48.7%) in the post-test phase. During the pretest phase, (52.7%) adolescents girls washed their cloths only with water and (47.3%) washed with soap and water. In the post-test period, the figures rose with (87.3%) girls washing their cloths with soap and water. For drying the cloths, in the pre-test period, only (30.7%) adolescent girls sun dried their cloths which increased to (94%) in the post-test phase. With regard to the final disposal off the pads, in the pre-test period, (93.3%) girls threw it in the dustbin, and (9) (0.6%) girls threw it by the roads.

**Fig. (1)** Total knowledge score regarding reproductive health

![Fig. 1](image1)

**Fig. (2)** Total practice score regarding reproductive health.

![Fig. 2](image2)
Figure (1 and 2) summarizes the total score of adolescents girl's knowledge and practice regarding reproductive health. The majority (86.7% and 82.7% respectively) girls had higher percentage of satisfactory knowledge and practice regarding menstruation at the post-test than the pre-test (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%) adolescents girls 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 practices 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 girls’ knowledge and practices towards reproductive health.

The current study revealed that the most of adolescent's girls had age from 19 to 21 years, concerning the marital status, the majority of the adolescents girls 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 girls reported that their parents have secondary and higher education. However, nearly half of the adolescents girls 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 girls 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 adolescents girls reported that they had their age of marriage from 18 to less than 21 years. Also nearly half of adolescent's girls 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 girls was 12.85±0.867 years. These results were supported by, (25) shown that 64.5% adolescent girls 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 girls had menstrual bleeding less than 7 days. While, the majority of adolescents girls 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 girls 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 girls 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 (222 cases, 55.2%) was the main barriers of the female youth reproductive health aim.

Regarding the correct knowledge of adolescent girls about first sign of pregnancy, complications related to early pregnancy, and antenatal check up, 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 girls (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 girls’ 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 girls 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 pre-test, 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 pre test)] after intervention. On the same line (31) suggested that other STDs known to girls were syphilis and gonorrhea (about 10% each). Most of the girls (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 girls 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 adolescents girls 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 were 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 students had a good knowledge regarding age at first menses, interval between 2 menstrual cycles at pre-test. About 49.5% of the students were not aware about ovulation. Their knowledge about ovulation and menstrual hygiene improved significantly from (77.2% to 95.6%) and (91.8% to 100%) respectively after intervention. The intervention significantly improved participants’ knowledge (p<0.001).

As regard the self care practices, there was lack of practices care of adolescent girls 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 subjects (80%) had personal hygiene especially during the monthly periods In spite of the large percentage of girls being aware of this fact, only 10 (8.3%) girls took bath daily. On the other hand, 24 girls (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 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%), 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 girls uses herbal in pretest compared to 52.7% adolescent girls in post test. also (43.3%) adolescent girls take medication with menstruation compared to 60.7% of adolescent girls in post test. Also 18.7% adolescent girls stay of home during menses. This result coincided with (35) revealed that around half of girls 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 girls using sanitary pad in post-test phase. As regards to number of changed pad/day, one third of adolescent girls changed 3
pad/day in the post-test phase. More than half of adolescents girls washed their cloths only with water and (47.3%) washed with soap and water. In the post-test phase, which increase to (87.3%) girls washing their cloths with soap and water in the post-test with significant difference. For drying the cloths, in the pre-test period, only (30.7%) adolescent girls sun dried their cloths which increased to (94%) in the post-test phase. With regard to the final disposal off the pads, in the pre-test period, majority of girls threw it in the dustbin, 9 girls threw it by the roads. The overall percentages of correct practices related to practices during menstruation among adolescents girls., before the intervention program and 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 respondents 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 post test majority(89.4%) changed pad thrice followed by twice(7.3%) and four times(3.3%) (P-value=<0.001). Also the respondents have correct practice of drying the cloth used as pad was practiced by 23.62 % during pre test which increased by 100% in post test (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%, their by showing improved menstrual hygiene and practice following health education. With regard to final disposal of pad, in the pre-test period, 66.7% girls threw it in the dustbin, 19.8% girls burnt it, 10.2% girls drained it and remaining of them threw it by the roads. In the post-test period, 97.3% girls reported that they threw the used pads in the dustbin.

Regarding the source of information about reproductive health, More than one third adolescents girls 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 the respondents heard from mothers i.e. 71%, followed by friends i.e. 19% and rest from teacher i.e. 10%.

**Conclusion**

Based on the results of this study, it suggests that educational strategies need to be put in place to support adolescent girls from different cultures to understand reproductive health as a serious condition. The present study had revealed low level of knowledge and practice of adolescent girls regarding reproductive health. 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. So Reproductive health problems should be solved on the first priority basis by focusing on the programs and services responsible for it. Each and every individual has the right to enjoy reproductive health and this is possible if the young generation has healthy children, healthy marital relation and happy family.
Recommendations

1- Early education and information sharing for adolescents' information service providers: the parents, teachers, community, church, health staff, and media, on adolescent health concerns and intensified and responsive counseling services shall be done. Education programmes need to tailor some of their messages to suit the needs of adolescents.

2- Since the students had lack knowledge about reproductive health, it is recommended that extra effort should be done to improve the students' level of knowledge especially in the areas of male and female sexuality, STDs and methods of contraception. The strategy could vary from the conduct of seminars, symposia, lectures, group discussions, experiential learning, film showing or inviting resource persons considered as authority in RH, so the students can be reminded of the need to maintain a healthy life.

3- Any Maternal and Child Health Centers (MCH) or health setting should provide health teaching for adolescent Community campaigns using various educational media are essential to increase knowledge and awareness about reproductive health among all girls or adolescents in order to identify the menstruation and the self care practices or appropriate management.

4- Development of in-service training programs for health care providers who take care of adolescent girls at orphanage home about issues related to menstruation and reproductive health.

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