Effect of a health education program about reproductive health on the knowledge and attitude of adolescent female Port Said University students

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Abstract: Adolescent reproductive health (RH) is both a challenge and an opportunity for health care providers. Egyptian girls reach puberty with little information about sexuality and reproduction. The aim of this study was to evaluate the effectiveness of a health education program addressing RH issues on the knowledge and attitude of adolescent female students. This quasi-experimental research was conducted on a convenience sample of 53 students at the University hostels for females in Port Said governorate. The researcher developed an educational program using the baseline information gathered in the assessment phase and related literature. A self-administered questionnaire was designed to assess pre-post changes in students' knowledge and attitude. The study was conducted from January to November 2011. The results revealed low pretest level of satisfactory knowledge (37.7%), which increased to 98.1% at the posttest ($p<0.001$). Healthcare providers were not mentioned as sources of information. Attitudes improved but with no statistical significance. Multivariate analysis showed that the intervention, student's age and being a nursing student were positive predictors of the knowledge score. The study concludes that adolescent female students' knowledge of RH is deficient, and their attitudes are mostly ambivalent or negative. Educational programs can significantly improve their knowledge, but may be less effective regarding attitudes. The role of the family and health care providers needs to be fostered.

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1. Introduction

Adolescents are an important resource for their families, communities and nation. With proper attention, support, guidance and nurturing, their contribution and participation can be greatly enhanced **(Parvin et al, 2008)**. According to WHO estimates, one in every five people in the world is an adolescent, i.e. between 10 and 19 years of age, with an estimated 1.2 billion adolescents alive today **(Blum & Nelson, 2005)**. Of these, about 85% live in developing countries. Moreover, four out of five young people live in developing countries **(UNFPA, 1998; WHO/UNFPA/UNICEF. (1999)**.

Egypt, as a developing countries, is at a stage in its demographic transition with a marked "youth bulge," a period in which the proportion of youth in the population increases significantly compared to other age groups **(The Population Council, 2010)**. Young people in the age interval 10–24 years make up almost one-third of the population of Egypt, about 23 millions **(Egypt: Youth Champions Working for Policy Implementation, 2005)**.

Adolescent reproductive health (RH) is both a challenge and an opportunity for health care providers. While adolescence generally is a healthy period of life, many adolescents are less informed, less experienced, and less comfortable accessing health services for RH than adults **(Population Reference Bureau and Center for Population Options, 1994; Program for Appropriate Technology in Health [PATH], 1999)**. Moreover, they often lack basic information and knowledge about RH, and access to affordable confidential RH services **(Noble, 1996)**. They are not getting even basic information from schools or from their parents who often feel uncomfortable about giving them this information considered as a taboo **(Alexander, 2000)**. The consequences on adolescents' health are ominous. A study demonstrated that more than half of the adolescent girls were malnourished, practiced unhygienic protective measures during menstruation, and experienced different types of reproductive health complaints ***(Parvin et al, 2008)***.

Egyptian girls reach puberty with little information about sexuality and reproduction. Mothers fear telling their daughters things that might "open their eyes prematurely" and prefer to give information only "when necessary," e.g., at first menstruation or just before their wedding night ***Seif el Dawla et al (1996)***. Moreover, the School Health Insurance System in Egypt does not systematically include reproductive healthcare for students and most RH services are only available to married women, although they should cover the whole life cycle **(Egypt: Youth Champions Working for Policy Implementation, 2005; UNFPA,**

2008). Nevertheless, the Ministry of Health and Population recently established eight youth-friendly clinics within teaching hospitals in different parts of Egypt to respond to the needs of both male and female youth life cycle **(Egypt: Youth Champions Working for Policy Implementation, 2005).** However, little is known about the quality and accuracy of young people's knowledge, attitudes and preference of RH service providers ***(CDC, 2003)***.

Learning about reproductive health is part of the larger developmental process as children become adults. Developing self-esteem, a sense of hope and goals for the future, and respect for others are also part of the process ***(Ugoji, 2008)***. Reproductive health knowledge related to fertility awareness, safe childbirth, family planning, and sexually transmitted infections, as well as possible ways to increase life expectancy and reduce mortality are important elements of research in reproductive health ***(Finger, 2000)***. Needless to say that reproductive health services and programs are most effective when appropriately targeted and tailored to the contexts in which young people live, and to their life circumstances ***(Tegegn et al, 2008)***.

Therefore, the aim of this study was to evaluate the effectiveness of a health education program addressing RH issues on the knowledge and attitude of adolescent female students. It was hypothesized that the adolescents' RH knowledge and attitudes will significantly improve after implementation of the educational program.

2. Subjects and Methods

Study designs and setting*:* The study was carried out using a quasi-experimental research design, with pre-post assessment to evaluate the effect of the educational health program. It was conducted at the University hostels for females in Port Said governorate.

Subjects: The study population subjects consisted of female university students in the university hostels in Port Said governorate. The inclusion criteria were age 15 to 19 years, living in the university hostels in Port Said governorate, and willing to participate in the educational program. No exclusion criteria were set. The sample size was calculated to detect any improvement in participant's knowledge or attitude from 30% (pre) to 60% (post), at 95% level of confidence, and 80% power. Accordingly, the required sample size was 48 students. This was increased to 53 students to compensate for a dropout rate of about 10%. A convenience sampling technique was used for recruitment of eligible participants. The sample included students from the faculties of nursing (20), computer sciences (17), commerce (12), and special education (4). They were from all four faculty grades from first to fourth years: 7, 15, 19, and 12 students respectively.

Data collection tools*:* The researcher developed a self-administered Arabic language questionnaire consisting of four parts. The first part was for adolescent's socio-demographic data such as age and marital status. The second part involved the menstrual history and associated complains. The third part included multiple choice questions and true false questions about knowledge related to RH. The questions covered the aspects RH definition, target, and components, menstruation (menarche, period, cycle, disorders, hygiene), reproductive tract infections (types, causes, symptoms, sexually transmitted diseases - STIs), female genital mutilation (FGM) types and problems, marriage and premarital counseling tests and services, and pregnancy and labor. This part also included questions about breast self exam (BSE). The last part included three questions asking the adolescent girl about her opinions regarding FGM and the reasons underlying its practice, and about family planning, in addition to a question about the sources of information regarding RH.

As for the scoring of knowledge, a correct response was scored 1 and the incorrect zero. For each area of knowledge, the scores of the items were summed-up and the total divided by the number of the items, giving a mean score for the part. These scores were converted into a percent score. Knowledge was considered satisfactory if the percent score was 50% or more and unsatisfactory if less than 50%.

The questionnaire was face and content validated through experts' opinions for clarity, relevance, and comprehensiveness. It was reviewed by a panel of experts in nursing field. The researcher modified the tool according to their comments. Since the tool did not contain a scale, no reliability testing could be applied to it.

Pilot study*:* After the development of the tools, a pilot study was carried out on 10% of the sample to ascertain the clarity and feasibility of the tool, to estimate the exact time needed for filling it up, and to detect any problems that might face the researcher and interfere with data collection. The questionnaire took 15 - 20 minutes to be completed. After conducting the pilot study, minor necessary changes were done mainly in the form of rephrasing some sentences and changing some terms. The tool was then finalized. The pilot sample was not included in the main study sample.

Administrative and Ethical Considerations:

An official permission was obtained by submission of an official letter from the Faculty of Nursing to the responsible authorities of the study setting to obtain the authorization for data collection. The aim of the study was explained to every student before participation, and voluntary participation was emphasized and an oral consent was obtained. Data collection was anonymous, and confidentiality of the data was secured. The procedures of the study could

not entail any harmful effects on participants. Professional help and advice was provided to participants in case of need.

Study maneuver

The study was conducted through four phases: assessment, program development, implementation, and evaluation. Collection of the data covered a period of one month from 15 January 2011 until 25 November 2011.

Assessment phase*:* The researcher recruited the study sample according to the set criteria. Those who consented to participate were given the self-administered questionnaire along with the instructions for filling it up. This was done individually to avoid bias from inter-changing information. The researcher was present all the time to respond to any raised queries.

Program development phase*:* The researcher developed an educational program using the baseline information gathered in the assessment phase as well as the reviewed related literature. It was tailored to the identified needs and demands of students in simple Arabic language. The program was then tested for validity by a panel of experts that included professors in maternal and gynecological nursing and in nursing education, and necessary modifications were done accordingly.

An instructional learning booklet was used as a handout to complement the health education sessions. It included four sections according to the program sessions. The first session covered the RH concept, aim, components, and services as well as adolescence and its characteristics for females including menstrual cycle and related personal hygiene. The second session covered the subjects of marriage age and the effect of early marriage on physical and psychological health, as well as family planning methods, and its advantages to women and families, and religious opinion. The third session was concerned with premarital care and its advantages and components, and the antenatal care and its importance and components. The fourth session involved reproductive infections mode of transmission and clinical picture and the STIs.

Implementation phase*:*

The participating students were divided into four groups of 13-15 each. The educational program was implemented for each group one session per week for a total of four sessions for each group and 16 sessions for all groups. The duration of the session was about two hours, and it was done according to student's available time and place for attendance, which was mostly in the afternoon. The program was implemented with the principles of adult learning emphasizing active participation, interaction, and critical thinking. Different teaching methods were used such as mini-lectures, group discussions, and demonstrations. The teaching media in included pamphlets, wall charts, and real objects prepared and used by the researcher, in addition to the booklet.

Evaluation phase: The effectiveness of the program was evaluated after implementation using the same self-administered tool.

Statistical analysis

Data entry and statistical analysis were done using SPSS 16.0 statistical software package. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables, and means and standard deviations for quantitative variables. Qualitative categorical variables were compared using chi-square test. Whenever the expected values in one or more of the cells in a 2x2 tables was less than 5, Fisher exact test was used instead. To identify the predictors of the knowledge score multiple linear regression analysis testing and analysis of variance for the full regression models were done. Statistical significance was considered at p-value <0.05.

3. Results

Students' mean age was 19.6, only 3 (5.7%) of them were married, and about two-fifth (37.7%) were firstborn (Table 1). The age at menarche ranged between 10 and 16 years, with mean 12.8. Almost all students reported having premenstrual (98.6%) and/or menstrual (90.1%) pain, which was mostly moderate. However, the pain was unbearable in 25.0% and 27.1% of them, respectively. It was managed by hot drinks in 77.4% of the cases. The most common symptoms associated with menses were depression, nervousness and anxiety.

Table 2 points to a wide discrepancy in students' knowledge at the pre-test. In some areas, the majority of them had satisfactory knowledge about RH definition and components (75.5%), and pregnancy and labor (83.0%). On the other extreme, only than one-fourth of them had satisfactory knowledge about menstruation (24.5%), FGM (24.5%), and marriage and premarital counseling (11.3%). In total, slightly less than one third of them (37.7%) had satisfactory knowledge.

The same table indicates statistically significant improvements in students' knowledge in all areas, reaching 100% in the area of pregnancy and labor. The areas that demonstrated lower percentages of improvement were those with lowest pre-test levels, namely menstruation (64.2%), FGM (64.2%), and marriage and premarital counseling (71.7%). In total, only one student (1.9%) had unsatisfactory knowledge at the post-test, and the difference was statistically significant ($p<0.001$).

Table 3 illustrates important differences in students' sources of information about menstruation and reproductive issues. For menstruation, the main sources are relatives or friends (52.8%), followed by study (41.3%), and mothers (24.5%). On the other hand,

the media constituted the main source of information about reproductive issues (54.7%), while mothers had no role. It is also noticed that the physician was not a source of information in either area.

Concerning students' attitudes, Table 4 demonstrates only minimal changes at the post-intervention phase. The only changes of statistical significance were related to their opinions about the reasons for FGM. It is evident that the hygienic reason decreased (p=0.046), while the social habit reason increased (p=0.047). The cosmetic reason also dropped, but not significantly. The table also demonstrates an increase in the percentage of students strongly disagreeing with FGM from about one third (34.0%), to about a half (52.8%) although the difference did not reach statistical significance. Similarly, the percentage of students agreeing with family planning increased from about two-fifth (41.5%) to about three-fifth (60.4%), but still with no statistical significance.

In multivariate analysis (Table 5), the model for students' knowledge score identified that the implementation of the intervention, as well as student's age and being a nursing student as positive predictors of the total score. The model explains 59% of the knowledge score variation. None of the other socio-demographic factors had a significant effect on the knowledge score.

Table 1: Personal and menstrual characteristics of students in the study sample (n=53)

	Frequency	Percent
Age (years):		
Range	17-22	
Mean±SD	19.6±1.1	
Marital status:		
Single	44	83.0
Engaged	6	11.3
Married	3	5.7
Birth order:		
1	20	37.7
2+	33	62.3
Have adolescent siblings	43	81.1
Age at menarche (years):		
Range	10-16	
Mean±SD	12.8±1.3	
Have premenstrual pain	52	98.1
Premenstrual pain severity:		
Mild	5	9.6
Moderate	23	44.2
Severe	11	21.2
Unbearable	13	25.0
Have menstrual pain	48	90.6
Menstrual pain severity:		
Mild	5	10.4
Moderate	16	33.3
Severe	14	29.2
Unbearable	13	27.1
Management of pain:		
Hot drinks	41	77.4
Analgesics	17	32.1
Rest	21	39.6
Symptoms associated with menses:		
Depression	34	64.2
Nervousness	33	62.3
Anxiety	31	58.5
Headache	16	30.2
Anorexia	1	1.9
Back pain	3	5.7

Table 2: Pre-post intervention students' knowledge about reproductive health

Satisfactory knowledge (50%+) about	Time				X^2 Test	p-value
	Pre (n=53)		Post (n=53)			
	No.	%	No.	%		
- RH (definition, target, components)	40	75.5	51	96.2	9.40	0.002*
- Menstruation (menarche, period, cycle, disorders, hygiene)	13	24.5	34	64.2	49.06	<0.001*
- Reproductive tract infections (types, causes, symptoms, STIs)	26	49.1	50	94.3	26.78	<0.001*
- FGM (types, problems)	13	24.5	34	64.2	16.86	<0.001*
- Marriage and premarital counseling (age, tests, services)	6	11.3	38	71.7	39.79	<0.001*
- Pregnancy and labor (age, ANC, contraception)	44	83.0	53	100.0	Fisher	0.003*
- Breast self exam (time, method, importance)	18	34.0	48	90.6	36.14	<0.001*
- Total knowledge:						
Satisfactory	20	37.7	52	98.1		
Unsatisfactory	33	62.3	1	1.9	44.34	<0.001*

(*) Statistically significant at p<0.05

Table 3: Students' sources of information about menstruation and reproductive health issues

Sources of information	Area			
	Menstruation		Reproduction	
	No.	%	No.	%
Relatives/friends	28	52.8	18	34.0
Study	22	41.5	17	32.1
Mother	13	24.5	0	0.0
Physician	0	0.0	0	0.0
Media	6	11.3	29	54.7
Books/magazines	4	7.5	6	11.3

Table 4: Pre-post intervention students' opinions about FGM and family planning

	Time				X^2 Test	p-value
	Pre (n=53)		Post (n=53)			
	No.	%	No.	%		
Reasons for FGM:						
Protection from seduction	16	30.2	15	28.3	0.05	0.83
Hygiene	8	15.1	2	3.8	3.98	0.046*
Cosmetic	4	7.5	1	1.9	Fisher	0.36
Social habit	16	30.2	26	49.1	3.94	0.047*
Religious order	10	18.9	9	17.0	0.06	0.80
Opinion about FGM:						
Strongly disagree	18	34.0	28	52.8		
Agree if indicated	27	50.9	19	35.8	3.85	0.15
Strongly agree	8	15.1	6	11.3		
Opinion about family planning:						
According to husband will	13	24.5	12	22.6		
Disagree	0	0.0	1	1.9	6.74	0.08
Neutral	18	34.0	8	15.1		
Strongly agree	22	41.5	32	60.4		

(*) Statistically significant at p<0.05

Table 5: Best fitting multiple linear regression model for students' pre-post changes in total knowledge scores

	Unstandardized Coefficients		Standardized Coefficients	t-test	p-value
	B	Std. Error			
Constant	-43.86	23.00		-1.906	.059
Intervention (reference: pre)	28.17	2.52	.71	11.194	<0.001
Age	2.85	1.15	.16	2.476	.015
Faculty (reference: non-nursing)	11.35	2.61	.28	4.353	<0.001

r-square = 0.59

Model ANOVA: F=49.52, p<0.001

Variables excluded by model: birth order, age at menarche, having adolescent sibling, marital status

4. Discussion

This study was carried out to test the hypotheses that the implementation of a health education program prepared for adolescent girls will lead to significant improvement in their knowledge and attitudes about RH issues. The findings lead to acceptance of the hypothesis related to knowledge but not attitude. The improvements in knowledge were significant in all areas, while only two items of the attitude demonstrated pre-post changes. The improvement was more evident with higher age and being a nursing student.

According to the study findings, the great majority of the students were suffering from premenstrual and menstrual pain, reaching more than 90%, and in about half of them the pain was severe or unbearable. These rates are much higher than other similar studies. Thus, ***Parvin et al (2008)*** indicated that 65% of adolescent girls were complaining of dysmenorrhea. Another study estimated the prevalence of dysmenorrhea as 71%, with 15% having pain that interfered with their daily life activities. The variability among studies may be related to the variation in pain tolerance and perception at the individual and societal levels. In this respect, ***Viana et al (2005)*** found that in healthy women with regular menstrual cycles, only subjective variables explain menstrual pain perception. Also, ***Wong (2011)*** highlighted that menstruation and elated pain are largely influenced by sociological, cultural, and family environmental factors. Similarly, ***Zhu et al (2010)*** reported statistically significant differences in menstrual pain perception between Australian and Chinese women, and attributed it to ethnic reasons.

The most frequently reported symptoms associated with menstruation among the present study participants were psychological in nature, such as depression, nervousness, and anxiety. These symptoms might be explained by the effect of hormonal changes on the mood. In agreement with this, ***Wong and Khoo (2011)*** in a cross-sectional study on Malaysian adolescents found that irritability, mood swing and tension were the three most frequently reported symptoms.

Although more than half of the present study students reported having severe to unbearable pain, the majority of them were managing it by hot drinks and/or rest. This may point to some exaggeration of the pain perception among them. Meanwhile, none of the girls mentioned the more important means to relieve menstrual pain such as exercise, diet and hot bathes which are most effective in relieving the severity of menstrual cramps. This reflects their low level of awareness regarding menstrual hygiene as indicated in the assessment of their knowledge.

The lines of management followed by the present study participants are similar to those reported in a study at El- Minia governorate, where about one-fourth of students just took rest, with intake of certain types of domestic hot drinks, while a few reported taking analgesics ***Abd El-Hameed et al (2011)***. On the other hand, a study in Iran found that over 67% of the girls were taking palliative medicine for their menstrual pain ***Poureslami et al (2002)***. This again shows the cross-cultural differences in the perception and management of menstrual pain ***(Zhu et al, 2010)***.

The current study has also demonstrated that about one third of the participating adolescents were complaining of headache during their menstrual periods. This is in fact a common problem during menstruation, and a menstrual migraine syndrome has been described, with brainstem excitability especially during the perimenstrual periods ***(Varlibas & Erdemoglu, 2009)***.

According to the present study findings, there are areas of major deficiency in the knowledge of adolescent girls about RH before the health education program. This was particularly evident in the areas of menstruation and its hygiene, FGM, and premarital counseling. If we also consider that about one third of the sample consists of nursing students who got information from study, the situation of deficient knowledge would be worse. The findings are in agreement with many previous studies that reported poor knowledge about reproductive health issues such as menstruation and puberty in India ***(Ray et al, 2011; Udgiri et al, 2010)*** and pregnancy and contraception in Nigeria ***(Adeokun et al, 2009)***.

The foregoing findings are certainly due to the societal norms and attitudes towards RH issues that are considered as restricted areas that should not be discussed. Therefore, the sources of information are mainly the relatives and friends who can speak freely to them, but often have incorrect or incomplete information. On the other hand, the role of the mothers is clearly deficient, where only about one fourth of the students had information about menstruation from their mothers, and none about reproduction. The rates are far lower from those reported by ***Adinma and Adinma (2009)*** 48.4%, ***Udgiri et al (2010)*** 57%, ***Tiwari et al (2006),*** 60.7%, and ***Lee et al (2006)***, 80%. However, in congruence with our study, ***El-Gilany et al (2005)*** similarly reported a lower share of mothers in the education of their daughters about RH.

What is more alarming is that the physicians had no role at all as source of information about RH in the present study. This might be due to the absence of adolescent RH services staffed with specially trained providers dedicated for them. However, the problem is not only in developing but also in developed countries. Thus, ***Houston et al (2006)*** found that only 2% of the adolescent females in their study in Washington DC had information about menstruation from their physicians. Other studies by ***Mohammadi et al (2006)***

and ***Tegegn et al (2008)*** and have similarly demonstrated a low role of health professionals and families as the source of information for the adolescents, giving more role to the media, internet, and books/magazines as the main sources of information.

After implementation of the study program, significant improvements in students' knowledge were noticed in all areas. This effectiveness of the program was further confirmed by multivariate analysis that showed the intervention as the most important independent predictor of the score of knowledge. However, other contributing factors are the higher age and being a nursing student. This is quite plausible since the two factors would evidently lead to better knowledge. This success of the program can be attributed to the process of adult learning and interactions followed during its implementation, and to the fact that it was custom-tailored to participants' needs. Similar success of educational programs in RH has been previously reported ***(Madeni et al, 2011; Ray et al, 2011)***.

On the other hand, the present study intervention seldom affected students' attitude. Although the percentages agreeing upon family planning and disagreeing upon FGM increased, they did not reach statistical significance. The only significant change in their attitudes towards the reasons underlying FGM was related to hygiene, which is the only reason not deeply rooted in the community such as the protection from seduction and religious order as noticed ***(Abdel Magied& Makki 2004; Dalal et al, 2010).*** Hence, despite the legal ban on female genital cutting, it is still practiced ***(Parvin et al, 2008)***. The same reasoning also applies to misconception regarding family planning as outlined by ***(Chipeta et al, 2010)***.

The attitudes and beliefs cannot be easily changed through an educational program; it needs more endeavors addressing the whole community and through various approaches as the media as well as the educational system. In agreement with these present study findings, ***Madeni et al (2011)*** found that their educational program was not successful in changing adolescents' attitudes towards RH. Conversely, ***Malleshappa et al (2011)*** reported significant improvement in attitude following their educational program.

The interpretation of the present study findings must consider its limitations. Firstly, the study design is only quasi-experimental, and thus could suffer the effects of selection bias, which could be prevented through true randomized trial design. Secondly, the inclusion of nursing students could have affected the level of knowledge and probably the attitude of the group.

Conclusion and Recommendations

The study concludes that adolescent female students' knowledge of RH is deficient, and their attitudes are mostly ambivalent or negative. A custom-tailored educational program can significantly improve their knowledge, but its effectiveness is less in changing their attitudes. The role of the family and health care providers needs to be fostered. The establishment of adolescent-friendly RH services is urgently needed. This would be the way to change the deeply rooted negative attitudes.

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