

Original Article

Impact of Educational Program on Reproductive Health Knowledge of Female Preparatory School Students in Alexandria Governorate

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Abstract

Background: The integration of reproductive health (RH) into national strategies and programs is one of the targets of the Sustainable Development Goals (SDGs) adopted by the United Nations General Assembly in September 2015.

Objective: Assessment of the effectiveness of an educational program on reproductive health knowledge of preparatory school female students in Alexandria Governorate.

Methods: A pre-post study design was conducted on 102 preparatory school female students by using a pre-designed self-administered questionnaire, covering four RH domains: puberty and menstrual cycle, genitourinary and sexually transmitted infections (STIs), menopause and female genital mutilation (FGM), as a tool for assessment of their RH knowledge before and after 6 weeks of applying an educational program for them.

Results: The results revealed that the total RH knowledge of the female students improved significantly after intervention, as 64.7% of participated girls had a satisfactory level of knowledge after the educational program compared to zero % before intervention. The four RH domains: puberty and menstrual cycle, genitourinary infections, menopause and female genital mutilation all showed significant increase in their knowledge score percentage after intervention.

Conclusion & Recommendation: RH educational program had a significant effect on the level of knowledge of the girls, thus we may recommend the integration of such education in the main school curriculum for the sake of improving their reproductive health.

Keywords: Reproductive health knowledge, Interventional educational program, Adolescent girls

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INTRODUCTION

Reproductive health (RH) is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity, in all matters relating to the reproductive system and to its functions and processes. It is a lifetime concern for both women and men, from infancy to old age. Evidence shows that RH in any of these life stages has a profound effect on one's health later in life. It is a prerequisite for social, economic and human development. ⁽¹⁾ The International Conference on Population and Development — ICPD (Cairo, 1994) marked an important turning point in international understandings of the significance of RH and rights. It brought RH into the global spotlight and shifted the terms of the RH debates from demographic targets to a rights-based approach. ⁽²⁾ The third target of The Sustainable Development Goals (SDGs) adopted by the United

Nations General Assembly in September 2015 which calls for good health and well-being included that: “By 2030, ensure universal access to sexual and reproductive health-care services, including family planning, information and education, and the integration of reproductive health into national strategies and programs”. ⁽³⁾ Adolescence (10- 19 years of age) is the transition from childhood to adulthood during which major biological changes as physical growth, sexual maturation and psycho-social development occur. ⁽⁴⁾ This age group constitutes about (19.4%) of the Egyptian population with slight increase in the rural population (20%) than in the urban population (18.3%). This difference is an outcome of lower fertility over the past several decades in urban areas compared with rural areas. ⁽⁵⁾ Adolescence represents a critical life stage to promote the adoption of healthy behaviors for lifelong health. Investing in adolescent health can help avert problems for the next generation, such as

prematurity and low birth weight in infants born to very young mothers. Prioritizing adolescent health simply is essential to end preventable deaths. ^(6, 7)

Adolescents often lack basic RH information, knowledge, and access to affordable confidential health services for RH. Many do not feel comfortable in discussing RH with parents. ⁽⁸⁾ During this phase of growth the girls first experience menstruation and related problems which is marked by feelings of anxiety and eagerness to know about this natural phenomenon. ⁽⁴⁾ Parents, health care workers, and educators frequently are unwilling or unable to provide complete, accurate, age-appropriate RH information to young people. This is often due to their own discomfort about the subject or the false belief that providing the information will encourage sexual activity. ⁽⁹⁾

Thus, the current study was conducted aiming at assessing the effectiveness of an educational program on reproductive health knowledge of female students in one public preparatory school at Alexandria Governorate.

METHODS

This study was conducted as a pre-post-test interventional study in an urban governmental preparatory school for girls located in East District of Alexandria Governorate. This was a part of a memorandum of understanding between the High Institute of Public Health- Alexandria University and the Board of Trustees of Education of East district of Alexandria, which included health education program focusing on RH issues for the students.

One class was randomly selected from each of the first and second grades. All female students in the chosen classes who accepted to participate in the study were included. Those were 102 female students.

A pre-designed self-administered questionnaire was used as a pre and post tool to collect data which included:

- Personal characteristics as: age, age of menarche, order of birth, mother's education and employment status.
- Knowledge assessment questionnaire including 37 closed ended questions; 11 multiple choice (including more than one correct answer) and 26 true or false questions. The questions covered four reproductive health knowledge domains: i) Puberty and menstrual cycle, ii) Genitourinary and sexually transmitted infections (STIs), iii) Menopause, and iv) Female genital mutilation (FGM).

A scoring system was used giving a value of 2 for each completely correct answer, a value of 1 for the partially correct one, and zero for incorrect one for the multiple-choice questions, while the true or false questions were given a value of 1 for correct answer, and zero for incorrect one. The maximum score was 48. The percentage of total score from maximum score was

calculated. Then it was divided into two categories as follows: unsatisfactory (less than 60%) and satisfactory (60% or more). The score percentage of each of the included four RH domains was calculated and divided into the same categories.

The study was conducted through 3 phases:

1. Pre-intervention reproductive health knowledge assessment: The participating girls answered the pre-designed self-administered RH knowledge assessment questionnaire.
2. Intervention phase: The participating female students were divided into four groups, each group attended two hours educational session. It took the form of health education sessions which included Power Point presentation, open discussions and handouts.
3. Post-intervention reproductive health knowledge assessment: 6 weeks after the intervention all participating female students completed the same questionnaire previously used in the pre-intervention phase.

Statistical Analysis

Data were coded, tabulated and statistically analyzed using the computer package SPSS version 20. ⁽¹⁰⁾ The cut off point for statistical significance was P value <0.05. The following tests were used:

- Kolmogorov-Smirnov test: to test normality of quantitative variables
- Mann Whitney Wilcoxon (MWW) test & Kruskal Wallis (K-W) test: as non-parametric tests for quantitative variables not normally distributed.
- Bonferroni Post Hoc test: to test differences in between groups
- Wilcoxon (W) signed ranks test: to test significant difference between paired quantitative data with abnormal distribution.

Ethical Considerations

The proposal of this study was reviewed and approved by the Institutional Review Board and Ethics Committee of the High Institute of Public Health, Alexandria University. The study conformed to the International Guidelines for Research Ethics. Permission from the Alexandria Education directorate was obtained to carry out the study. A verbal consent was taken from the participated students and written consents from their parents (through school administration) after explanation of the purpose and benefits of the study. There is no conflict of interest. Confidentiality of the data was assured.

RESULTS

Table (1) shows that the mean age of the participating female students was 12.8 ± 0.7 with a minimum of 11 and maximum of 14 years. About one third of them (32.4%) were the first ordered sibling in their families and 71% of them reached puberty. In relation to their mothers, more than one third of them (34.3%) had basic education, 14.7% were university graduates and the

minorities were illiterates. Most of the mothers (64.7%) were house wives.

Table (2) reveals that before the intervention, none of the participated female students had satisfactory RH knowledge in general. Knowledge about genitourinary infections was the worst with a median score percentage 33.3 (26.7- 40.0) followed by knowledge about puberty and menstrual cycle with median score percentage 35.4 (25.0- 45.8). The highest level of RH knowledge was related to knowledge about female genital mutilation (FGM) with median score percentage 75.0 (00.0- 100.0) followed by those about menopause with median score percentage 50.0 (20.0- 60.0).

The total RH knowledge increased significantly after intervention where 64.7% of participated female students showed satisfactory level of knowledge compared with zero % before intervention. The four RH domains: puberty & menstrual cycle, genitourinary infections, menopause and female genital mutilation all showed significant increase in their median knowledge score percentage, where, they became 62.5 (54.2- 70.8), 53.3 (46.7-53.3), 70.0 (60.0- 80.0) and 100.0 (75.0-100.0) respectively.

Table (1): Personal characteristics of participating preparatory female students

Personal characteristics	Preparatory female students (n=102)	
	No.	%
Age (years)		
11-<13	33	32.4
13-14	69	67.6
Min-Max		11.0-14.0
Mean \pm SD		12.8 \pm 0.7
Birth order		
1 st child	33	32.4
2 nd child or more	69	67.6
Reached puberty	73	71.6
Educational level of mothers		
Illiterate	12	11.8
Read and write	17	16.7
Basic education	35	34.3
Secondary education	23	22.5
University education	15	14.7
Employment of mother		
Housewife	66	64.7
Working	36	35.3

Table 2: Comparison between knowledge score percentage of the studied female students before and after the intervention program

Knowledge	Preparatory female students				Significance
	Before program		After program		
	No.	%	No.	%	
Domain 1: Puberty & menstrual cycle					
Unsatisfactory (<60%)	99	97.1	33	32.4	
Satisfactory (\geq 60%)	3	2.9	69	67.6	
Min-Max	0.0 – 62.5		37.5 – 79.2		W=8.382
Median (Q1-Q3)	35.4(25.0-45.8)		62.5(54.2-70..8)		P<0.0001*
Domain 2: Genito-urinary infections					
Unsatisfactory (<60%)	102	100	78	76.5	
Satisfactory (\geq 60%)	0	0.0	24	23.5	
Min-Max	0.0 – 46.7		20.0 – 66.7		W=8.149
Median (Q1-Q3)	33.3(26.7-40.0)		53.3(46.7-53.3)		P<0.0001*
Domain 3: Menopause					
Unsatisfactory (<60%)	51	50	18	17.6	
Satisfactory (\geq 60%)	51	50	84	82.4	
Min-Max	0.0 – 80.0		20.0 – 100.0		W=5.893
Median (Q1-Q3)	50.0(20.0-60.0)		70.0(60.0-80.0)		P<0.0001*
Domain 4: Female sexual mutilation					
Unsatisfactory (<60%)	48	47.1	21	20.6	
Satisfactory (\geq 60%)	54	52.9	81	79.4	
Min-Max	0.0 – 100.0		0.0 – 100.0		W=5.921
Median (Q1-Q3)	75.0(0.0-100.0)		100.0(75.0-100.0)		P<0.0001*
Total score					
Unsatisfactory (<60%)	102	100%	36	35.3%	
Satisfactory (\geq 60%)	0	0.0%	66	64.7%	
Min-Max	0.00- 58.3		35.4 – 70.8		W=8.511
Median (Q1-Q3)	40.7(31.3-47.9)		62.5(54.2-66.7)		P<0.0001*

W=Wilcoxon signed ranks test

* significant ($p<0.05$)

The female students who have reached puberty had higher median knowledge score percentage 41.7 (34.4-48.9) while those who haven't had median knowledge score percentage 25.0 (4.2- 43.8). This relation was statistically significant with $MWW= 3.405$ and $p= 0.001$. Female students whose mothers were illiterates had low median knowledge score percentage 37.5 (1.1-43.3) while university graduate mothers' daughters had statistically significant higher median knowledge score percentage 47.9 (41.7- 56.3). Daughters of working mothers had a median knowledge score percentage 42.8 (21.9- 51.1), meanwhile daughters of house wives had a slightly lower median knowledge score percentage 39.6 (33.3- 43.8) with no statistical significant relation.

Table (3) represents the relation between pre-intervention knowledge score percentage and personal characteristics of participants. The female students aged 13-14 years were more knowledgeable with a median score percentage 41.7 (35.4- 50.0) compared with those younger than 13 years who had median score percentage 25.0 (4.2- 43.8). This relation was statistically significant where $MWW = 3.843$ and $p < 0.0001$. Being a first ordered sibling in a family was related significantly with less median knowledge score percentage 31.3 (18.8 – 43.8), while those who had a birth order of 2 or more had a median score percentage of 41.7 (33.3- 52.1) with $MWW = 3.39$ and $p= 0.001$.

Table (3): Relation between pre-intervention knowledge score percentage and personal characteristics of the studied female students

Personal characteristics	Preparatory female students			Significance
	Score of knowledge before program			
	No.	Min-Max	Median (Q1-Q3)	
Age (years)				
11-<13	33	0.0- 56.3	25.0(4.2-43.8)	$MWW=3.843$
13-14	69	18.8- 58.3	41.7(35.4-50.0)	$P<0.0001^*$
Birth order				
1 st child	33	0.00- 47.9	31.3(18.8-43.8)	$MWW=3.39$
2 nd child or more	69	0.00- 58.3	41.7(33.3-52.1)	$P=0.001^*$
Reached puberty				
No	29	0.0-56.3	25.0(4.2-43.8)	$MWW=3.405$
Yes	73	0.0-58.3	41.7(34.4-48.9)	$P=0.001^*$
Educational level of mothers				
Illiterate	12	0.0-56.3	37.5(1.1-43.3)	$K-W=3.972$
Read and write	17	0.0-58.3	33.3(12.5-46.9)	$P=0.005^*$
Basic education	35	0.0-58.3	39.6(20.8-43.8)	(Illiterate/university)
Secondary education	23	20.8-58.3	43.8(31.3-52.1)	*
University education	15	4.2-58.3	47.9(41.7-56.3)	
Employment of mother				
Housewife	66	0.00- 58.30	39.6(33.3-43.8)	$MWW=0.727$
Working	36	4.20- 58.30	42.8(21.9-51.1)	$P=0.467$

$MWW=$ Mann Whitney Wilcoxon test, $K-W=$ Kruskal Wallis test
(Illiterate/university)*: Significant difference by Bonferroni Post Hoc test

* significant ($p < 0.05$)

DISCUSSION

RH is an essential component of healthy development for young people. There is an increasing body of evidence that RH education through acceptable reliable sources can result in young adults adopting responsible choices and favorable sexual behaviors.^(11,12) Despite its widely recognized importance, promotion of RH through education remains a sensitive and controversial issue.⁽¹³⁾ Providing adolescent girls with reliable trusted sources of RH education poses a challenge in the different world regions and the different cultural contexts. The present study was conducted to explore adolescent girls' RH knowledge, and their informational needs. It also aimed to construct and examine the effect of a culturally sensitive educational program to improve girls' RH knowledge. A large body

of scientific research in both developed and developing countries has shown that RH education programs, as a reliable trusted formal source of RH education, have improved the overall health of young people.⁽¹⁴⁾ However, in Egypt, health education is deficient in the public school curriculum, and activities related to RH are particularly inadequate. A few short lessons on reproductive health were first added to the school curriculum after the 1994 UN population conference.⁽¹⁵⁾

Results of the current pre-post intervention provide evidence of the efficacy of a cultural sensitive intervention designed to improve adolescent girls' RH knowledge in Alexandria, Egypt. Success of a similar intervention tackling similar RH areas was reported in Alexandria.⁽¹⁶⁾ A nearly similar study design was conducted in Alexandria, Egypt, 2011, as part of a two-year program implemented by the Alexandria Regional

Centre for Women's Health and Development about RH awareness among girls in secondary schools in Alexandria (an older age category than ours). The program's goal was to raise awareness about the needs of adolescent girls for age-appropriate RH information and to identify the existing gaps in the school system for meeting such needs. They reported successful increase in girls overall knowledge by 60%.⁽¹⁶⁾

School-based RH interventions proved success also in other developing countries such as India, Bangladesh, Nigeria, Mumbai, Iran and Tanzania.⁽¹⁷⁾ Another school-based educational intervention proved success in Upper Egypt; however, it only covered knowledge about AIDS among secondary technical schools students with a range of age 16 to 20 years of both gender. Only 30.8% had satisfactory knowledge about AIDS in the pretest. Statistically significant improvement in knowledge was revealed after program implementation⁽¹⁸⁾.

In the pre-intervention assessment of RH knowledge in the current study, none of the female students had satisfactory level of knowledge. Similar results were reported by Mounir et al., on assessing RH knowledge and attitude among female university students in Alexandria, revealing that none of them had satisfactory knowledge level while 61.7 % and 38.3% respectively had fair and poor score levels.⁽¹⁹⁾ Participation in the intervention resulted in improvement in different RH domains among participating female students. However, despite the significant improvement in the total knowledge scores, best knowledge scores were regarding FGM and menstruation. This could be attributed to the persistence high prevalence and slow decrease of FGM in Egypt despite the deliberate efforts to combat FGM.⁽⁵⁾

Despite its importance, least end-line knowledge score was encountered for genitourinary infections. Mounir et al., also found that only 11.9% and 3.9% of Alexandria University female students reported complete answer about STIs and methods of their protection respectively.⁽¹⁹⁾ Thus, future interventions should put more stress related to infection issues and STIs. Comparably, a systematic review of published literature on awareness and knowledge of STDs in Europe reported low levels of awareness and knowledge about sexually transmitted diseases, with the exception of HIV/AIDS, among school-going adolescents.⁽²⁰⁾

In the present study, the pre- intervention RH knowledge score was related significantly with not being a first ordered sibling, this result agrees with the results of El-Lassyand Madian, as they explained this by that elder sisters were the main source of information about the occurrence of menarche for 53.8% of girls.⁽²¹⁾ In the contrary, the present results concerning the relation between mothers' education and RH knowledge score didn't match El-Lassyand Madian⁽²¹⁾

findings' as they reported negative correlation between mother's education and their daughters' menstrual knowledge and practices. Meanwhile, the present results were similar to that reported by Simbar et al., who found that RH knowledge and attitudes of Iranian college students were significantly correlated with a higher level of education of mothers ($p < 0.05$) and older age of studied girls ($p < 0.01$).⁽²²⁾

Results of the present intervention are important for several reasons. First, to-date this one of the rarely studied school-based RH education intervention is the first developed culture-sensitive program specifically designed for Egyptian girl to improve their RH knowledge. Second, the potential for applicability of this intervention to other Egyptian schools should be considered seriously. In addition, the results provide guidance for the inclusion of specific content in interventions to improve adolescents' RH knowledge; specifically, FGM, pubertal changes and menstruation, and STIs and genital infection. It supports recommendations about the need and importance of trusted reliable school-based RH education. This will ensure that adolescent girl will have correct favorable RH knowledge that will enable them to pass this critical period safely and promote their adult lives.

CONCLUSION & RECOMMENDATIONS

It's recommended for future intervention programs to be based on control groups such as the quasi-experimental design or the RCT with longer term mixed qualitative- quantitative evaluation. Despite these limitations, this study is an important contribution for assisting Egyptian policymakers and those working in the areas of adolescents' health in planning and establishing school-based RH education programs to support adolescent girls during this transitional period and go safely to adulthood. It is an important effort in providing an evidence base for policy makers and practitioners working in the area of youth and adolescents' RH to renew the existing national RH strategy, and to address the rising threats and challenges in the area of youth and adolescents' RH. In addition, it provides researchers with a base from which to test and develop similar interventions for Egyptian schools. Finally, further studies should be conducted to determine effective ways of implementation of school-based RH programs and interventions in different types of schools (public, private and technical) the effect of knowledge improvement on safe behaviors.

Limitations of the Study

The results of this study should be considered in light of several limitations. First, the short duration of the evaluation, where there was a need to test the effect of the intervention on longer duration to determine the amount of retained knowledge, but unfortunately, the study duration was limited by the scholarly schedule.

Second, the sample size was small and was not based on random recruitment which affects the generalizability of the results, which was difficult to implement due to difficulty of obtaining permissions to conduct such type of studies. Finally, the pre-post design limits causal inference and temporal relationship (cause-effect relationship) between the intervention and the results which is recommended for further research.

Conflict of Interest: None to declare.

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