

Effect of Planned Nursing Educational Program on Female Adolescents' Knowledge and Perception Regarding Early Marriage

Safia Belal¹, Randa Mohamed Abobaker², Asmaa Saber Ghaly³, Amal Hashem Mohamed⁴, Samah Faisal Fakhry⁵, Fatma Mostafa Mahrous⁵, Adel Ali Abdelwahab⁶, Marwa Fouad Hanafy⁷, Ghada Sobhy Hassan⁸, Amany Lotfy Ahmed⁹, Marwa Mohamed Abobaker^{10*}

¹Assistant Professor, College of Applied Medical Sciences, Ksa

Email: sofy3131@gmail.com

²Associate Professor, College of Nursing, University of Hafr Al-Batin, Ksa

Email: randaabobakre@gmail.com

³Assistant Professor, Faculty of Nursing, Alexandria University, Egypt

Email: asmaaghaly2012@gmail.com

⁴Associate Professor, North Private College of Nursing, Arar City, Northern Borders Region, Ksa; Assistant Professor, Faculty of Nursing, Minia University, Minia City, Egypt

Email: amalhasem@nec.edu.sa

⁵Professor, Faculty of Nursing, Ain Shams University, May University in Cairo, Egypt

Email: fatma.mahrous@muc.edu.eg, samah.faisal@muc.edu.eg

⁶Associate Professor, Faculty of Nursing, Northern Border University, Ksa

Email: dradelaly2019@yahoo.com

⁷Lecturer, Faculty of Nursing, Damanhour University, Egypt

Email: marwa.fouad@nur.dmu.edu.eg

⁸Assistant Professor, Faculty of Nursing, Ain Shams University, Egypt; Assistant Professor, North Private College of Nursing, Arar City, Ksa

Email: dr.ghada.sobhy@nursing.asu.edu.eg

⁹Assistant Professor, Faculty of Nursing, Kafr Elsheikh University, Egypt; Assistant Professor, North Private College of Nursing, Arar City, Ksa

Email: amanylotfy@nec.edu.sa

^{10*}Lecturer, Faculty of Nursing, May University in Cairo, Egypt (Corresponding Author)

Email: marwa.abdelkhalik@muc.edu.eg

Received: 17th Mar, 2026 | Revised: 29th Mar, 2026 | Accepted: 19th Apr, 2026 | Available Online: 5th May, 2026

ABSTRACT

Background: Early marriage is a worldwide problem associated with a range of health and social consequences for girls. Educational interventions are considered an effective strategy to improve awareness and reduce associated risks. The study aimed to examine the effect of a planned nursing educational program on female adolescents' knowledge and perception regarding early marriage and reproductive health.

Research Design: A quasi-experimental, one-group pretest–posttest design was employed.

Setting: This study was conducted in the Damanhour Governorate, encompassing both public and private preparatory schools.

Methods and Sampling: A quasi-experimental study was conducted among 200 female adolescents. A self-administered, planned questionnaire was used to collect descriptive data, assess knowledge of the female reproductive system and early marriage, and evaluate perceptions of adverse consequences. Pre- and post-program scores were analyzed using Chi-square tests and paired t-tests.

Results: The planned program significantly improved the knowledge and perception of female adolescents. Knowledge of females about the reproductive system increased from 19.7% to 65.7%, and total satisfactory knowledge regarding early marriage increased from 9.5% to 90.5% ($p < 0.001$). Positive perception toward the adverse

Effect of Planned Nursing Educational Program on Female Adolescents' Knowledge and Perception Regarding Early Marriage

consequences of early marriage increased from 36% to 69%, with substantial improvements across physical, psychological, and social domains ($p < 0.001$).

Conclusion: The planned nursing educational program was effective in enhancing female adolescents' knowledge and perception related to early marriage and reproductive health. Implementing similar educational interventions can support adolescents' well-being and delay early marriage.

Keywords: Early Marriage, Female Adolescent, Knowledge, Perception, Nursing Education Program

How to cite this article: Belal S, Abobaker R M, Ghaly A S, Mohamed A H, Fakhry S F, Mahrous F M, Abdelwahab A A, Hanafy M F, Hassan G S, Ahmed A L, Abobaker M M., Effect of Planned Nursing Educational Program on Female Adolescents' Knowledge and Perception Regarding Early Marriage. *Int J Drug Deliv Technol.* 2026;16(43s): 936-945; Doi: 10.25258/Ijddt.16.43s.101

Socially, early marriage often interrupts education, limiting future opportunities and reinforcing cycles of poverty, while also increasing the risk of isolation and domestic violence (Berliana et al., 2021; Shukla et al., 2023).

Addressing early marriage requires more than awareness, it demands supportive environments and practical interventions. In this regard, maternity nurses play a vital and compassionate role. As trusted healthcare providers, they can educate, counsel, and empower adolescent girls and their families to make informed decisions. Through structured educational programs and supportive communication, nurses can help reduce the incidence of early marriage and promote healthier futures for young girls (Chandel et al., 2025; Lassi et al., 2024). Therefore, this study seeks to evaluate the impact of a planned nursing educational program on female adolescents' knowledge, and perceptions, regarding early marriage.

1.1. Research Hypotheses :

Female adolescents exposed to the educational program will demonstrate significantly higher post-intervention scores in knowledge, and perception, compared to pre-intervention scores.

2. Methods

2.1 Design and Setting

A quasi-experimental, one-group pretest–posttest design was utilized. The study was conducted in two preparatory schools for girls located in rural areas of Beheira Governorate, Egypt: Modern Preparatory School for Girls and A Preparatory School for Girls. These schools were selected due to their high student density, as they are situated in relatively large and populated areas.

2.2 Participants and Sampling

1. Introduction

Adolescence is a crucial stage in a girl's life, marked by rapid physical, emotional, and social changes that significantly influence her future health and well-being. During this period, girls move through important transitions from childhood to adulthood, through different levels of education, and eventually toward work and family responsibilities. While this stage offers opportunities for growth and development, it is also a time of increased vulnerability. Many adolescent girls face challenges such as school dropout, early marriage, early pregnancy, violence, and increased health risks, all of which can shape their life trajectory (Hailu & Beyene, 2025).

Among these challenges, early marriage remains a major global concern, particularly for girls. Defined as marriage before the age of 18, it continues to affect millions worldwide, especially in low- and middle-income countries (Sütlü & Kutlu, 2025; Chandel et al., 2025). According to global estimates, nearly 15 million girls are married each year before adulthood, contributing to approximately 750 million women who were married as children (Gidmark, 2025). In Egypt, this issue is still prevalent, with a notable proportion of young women reporting marriage before the legal age (Hendy, 2024).

The consequences of early marriage extend beyond the individual's and affect health, psychology, and social well-being. Physically, early pregnancy places young girls at higher risk of serious complications, including maternal mortality and poor birth outcomes (Banerjee et al., 2024). Psychologically, the sudden transition into marital and family responsibilities, often combined with limited support, can lead to anxiety, depression, and a sense of loss of control (Nhampoca & Maritz, 2024; John et al., 2023).

Effect of Planned Nursing Educational Program on Female Adolescents' Knowledge and Perception Regarding Early Marriage

addressed with the director of schools for female adolescents, followed by discussions with the female students. This included topics such as the confidentiality of the information gathered from them and their right to withdraw from the study at any point. After that, oral consent was gained from female students to apply to the study. Also, a social specialist from the school joined each session and gained a copy of the data collection tools and the program booklet. We assured the female students and their parents that their students' non-participation would not impact their academic or social status. Confidentiality of the obtained information was ensured as each assessment sheet was coded, and the female students' names did not appear on the questionnaire forms.

2.4 Instruments

A total of **three tools** were employed for data collection in this study. These tools were created by researchers based on an extensive review of recent literature and expert consultation to ensure content validity and relevance. The tools were designed as follows:

Tool I: A Self-Administered Questionnaire was prepared and planned by the researchers based on the recent related literature review and experts' opinions. It included two sections:

Section (A): Descriptive Characteristics:

This section encompasses various descriptive data, including students' ages, family size, parents' educational levels and occupations, the presence of siblings, the number of sisters and brothers, their birth order, and the monthly income available to meet familial needs. Additionally, it involves the Family Crowding Index (FCI), which has been adapted from guidelines by the American Association of Public Opinion Research (2007). The formula for calculating this index is as follows: Family Crowding Index = number of individuals in a household/number of rooms designated for sleeping. A result of less than 3 indicates a non-crowded situation, while a result exceeding 3 signifies overcrowding. The scoring system for the crowding index classifies families as follows: non-crowded family (<3), and Overcrowded family (>3).

Section (B): Assess female knowledge pre-post-nursing educational program includes:

A purposive sample was employed in this research. The participants were school children aged 14–16 years. The total enrollment of the two educational institutions was 420, comprising 275 female students at A Preparatory School for Girls and 145 female students at the Modern Preparatory School for Girls.

Inclusion criteria:

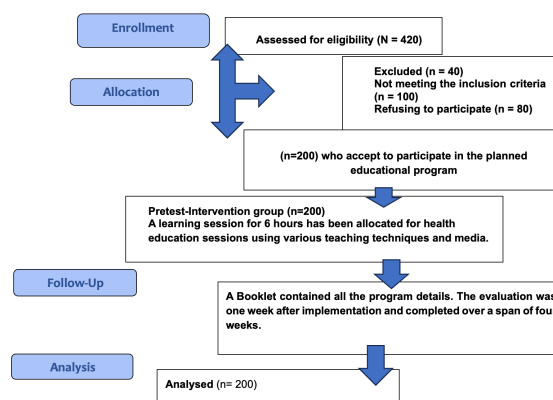
1. Enrolled in grades 7–9
2. Willing to participate
3. Parental consent obtained

$$n = \frac{N \times p(1-p)}{\left[N-1 \times \left(d^2 \div z^2 \right) + p(1-p) \right]}$$

$$= \frac{420 \times 0.50(1-0.50)}{\left\{ (420-1) \times (0.05^2 \div 1.96^2) \right\} + 0.50(1-0.50)} = 200$$

The sample size needed was determined using the standard formula for estimating a population proportion. For a 95% confidence level, Z was set at 1.96, with an expected proportion (p) of 0.5 and a margin of error (d) of 0.05. This calculation indicated that at least 200 participants were necessary, which corresponds to the actual sample size utilized in the study (Thompson, 2021).

Figure 1: Consort flow diagram



2.3 Ethical Considerations

An official permission was obtained from the Research Ethics Commission at the College of Nursing at Damanhur University, involving the intervention program (Date: March /2025; ID/Zu. Research code: 110-k) for the study. Ethical approval was obtained from the Directorate of Education in Beheira governorate and administration in the previously mentioned cities, and then the researchers contacted the schools' headmasters through written communication. Ethical considerations were

Effect of Planned Nursing Educational Program on Female Adolescents' Knowledge and Perception Regarding Early Marriage

adolescents, elevating the awareness of the community, and confirming the participation of girls.

Scoring system for perception: the rating scale consisted of a points scale, which has a score ranging from zero to two distributed as follows: Agree =2, Sometimes = 1, Disagree 0. The scale included 39 statements, with the maximum score for students being two, then the whole scale score was 78 points. The final score of students' replies was either 60% or above, representing positive perception, or less than 60%, denoting negative perception.

2.5 Validity

Content validity of the study tool was evaluated by five specialists from the Obstetric and Gynecologic Nursing Department, Faculty of Nursing, Damansara University. Internal consistency was assessed using Cronbach's alpha, which indicated moderate to high reliability, reflecting the relative homogeneity of the tool's items. A pilot study was conducted with 20 students, representing approximately 10% of the target sample, to evaluate the clarity, applicability, and time required to complete the tools. Based on the pilot study results, modifications were made, including rewording, additions, and omissions, to improve the clarity and precision of the questionnaire. Participants in the pilot study were excluded from the final study sample.

2.6 Data Collection Procedure: The study was accomplished by passing through dissimilar phases, including a preliminary phase and a fieldwork phase.

A. Primary phase:

After reviewing the literature about the research theme using accessible books, journals, articles, and nursing magazines. Then, the researcher went on to visit each school, meet the director, and clarify the purpose of the study and the content of the program. The assessment phase (pretest) was done for 200 female students and took four weeks to be completed; nearly 30 female students were evaluated per visit.

Implementation of the program was divided into 2 days/week (Monday, Tuesday), 3 hours/day from 9 am- 11 am. This was determined by the director of the school. One school was visited / day (previously mentioned schools), and the number of hours varied from one session to another. As for the evaluation

A- Female reproductive system, such as the anatomy of the internal and external reproductive system, concept, importance, and purposes.

B- Early marriage, such as the early marriage definition, a legal marriage age, a proper age for 1st pregnancy, an appropriate period between pregnancies, causes, advantages, and disadvantages for early marriage, and the presence of a law that forbids getting married young.

Scoring system for knowledge: related to female students' knowledge assessment, a correct answer scored one, and each incorrect answer scored zero; the whole knowledge question scored 38 points. A total of 60% or above was considered satisfactory, and less than 60% was considered unsatisfactory.

Tool II: Female perception pre-post-nursing educational program includes:

A: Early marriage is influenced by various factors such as parental rights to arrange marriages, societal pressures on young rural girls, and the belief that early marriage can lead to positive changes in a girl's life. However, it also significantly impacts education and health. Customs, traditions, and religious beliefs contribute to the prevalence of early marriages. Additionally, family economic conditions and maternal health issues can result in early marriages. This practice is associated with an increase in domestic violence and poses barriers to social progress and development.

B- Adverse bio-psycho-social health consequences of early marriage, which included the following items:

(a) Physical health consequences of early marriage, such as infant and maternal death, Physical health problems, Menstrual disturbance, obstetric and children's issues

(b) Psychological health consequences of early marriage regarding psychological issues, stress, and anxiety

(c) Social health consequences of early marriage, such as family and domestic violence, termination of school, social exclusion, marital issues, increased poverty, bigamy, rise in divorce, difficulty in managing issues, inability to rear children, and non-consequences.

(d) Preventive measures for early marriage, such as law application, parents, and girls' education, improving the status of economically disadvantaged

Effect of Planned Nursing Educational Program on Female Adolescents' Knowledge and Perception Regarding Early Marriage

taking into consideration using simple and clear language to suit the level of all students.

By the end of each session, a summary was made, and time was allocated for questions, answers, and a plan for the next session was made. Teaching methods and media used are lectures, group discussion, demonstration, and re-demonstration. Suitable teaching aids prepared especially for the program were used, such as printed materials and video clips about the Anatomy of the female reproductive system, and physical exercises.

Program Booklet: It included all the content of the program, which was designed and given to female students as an educational reference during program implementation and as a self-learning reference post-program implementation. It aimed to provide accurate knowledge related guideline instructions about early marriage and aspects of health promotion for female students.

C. Evaluation Phase: It focused on assessing the extent of enhancement in knowledge, attitudes, and health behaviors among female adolescents following the introduction of a prevention program. It also sought to pinpoint differences and similarities, as well as identify areas for improvement and shortcomings. The evaluation occurred one week after implementation and was completed over a span of four weeks.

2.7 Statistical Design

Data was edited, coded, analyzed, and tabulated using SPSS as a statistical technique included frequency, percentage, mean, standard deviation, chi-square (X^2), paired t-test, and p-value was used, with significance set at $p < 0.05$. Quantitative variables were summarized as mean \pm standard deviation, while qualitative variables were presented as frequencies and percentages. Inferential statistics included the Chi-square (χ^2) test to assess differences between categorical variables, the independent-samples t-test to compare means between two groups, and one-way ANOVA for comparisons among multiple groups.

3. Results

3.1 Descriptive Characteristics of the Female.

Table 1 presents that the participants had a mean age of 15.06 ± 0.91 years, with the majority being 16 years

phase (post-test), it was done over four weeks to evaluate the level of enhancement among the female students.

B. Secondary Phase:

1. Program Development:

According to the literature on many aspects of female health prevention, the researcher used data from pre-assessment tools to construct the program. Experts from Beheira University's Obstetric Health Nursing Department and Faculty of Nursing reviewed and approved the program's content.

2. Assessment:

Over four weeks, a pretest centered on gathering information on the students' knowledge and perceptions was used to assess the students' requirements; filling out the instruments took an average of 20 to 25 minutes.

3. Programming Implementation:

The program application is based on carrying out a lesson plan using various teaching techniques and media, utilizing a laptop to display data, and using a guidebook that was specially created and developed in response to the assessment needs of the students.

Program objectives: By the end of the intervention, the student will be able to:

- Gain knowledge related to reproductive health topics.
- Acquire basic knowledge about the early marriage health consequences program.
- Understand preventive actions regarding the early marriage health consequences program.
- Clarify perceptions about the adverse biopsychosocial health consequences of early marriage.

Program Sessions:

Time allowed: 4 hours have been allocated for health education sessions. Distributed as (2 hrs for theory). The implementation program was carried out two days/week, three hours/day (9 am- 11 Am), "this was determined by the school director & or students", one school was visited / day.

At the beginning of the first session, an orientation about the program and its purposes was given. It was agreed at the time of the sessions with the female Adolescent. From the 2nd session, each session started with a summary of what was covered through the previous sessions and the objectives of the new one,

Effect of Planned Nursing Educational Program on Female Adolescents' Knowledge and Perception Regarding Early Marriage

Table 6 demonstrates a strong positive relationship between knowledge and perception. Among students with satisfactory knowledge, 79.4% exhibited positive perception, whereas only 43.8% of students with unsatisfactory knowledge had positive perception ($p < 0.001$).

3.7 Association Between Female Knowledge and Perception, Pre- and Post-Planned Nursing Educational Program: -

Table 7 presents significant improvements post-program. The mean knowledge score increased from 12.7 ± 3.3 to 28.6 ± 8.2 , and perception from 28.3 ± 7.7 to 54.2 ± 7.9 , reflecting the effectiveness of the intervention.

4. Tables

Table (1): Descriptive characteristics of the studied participants ($n=200$).

Items	Category	Frequency	(%)
Female Ages (years)	14	76	38.0
	15	36	18.0
	16	88	44.0
	Mean \pm SD		15 \pm 0.91
Having Siblings	Yes	191	95.5
	No	9	4.5
Number of brothers	0	11	5.5
	1	23	11.5
	2	57	28.5
	≥ 3	109	54.5
Number of sisters	0	16	8.0
	1	47	23.5
	2	66	33.0
	≥ 3	71	35.5
Ranking among siblings (Birth Order)	1 st	44	22.0
	2 nd	43	21.5
	3 rd	77	38.5
	4 th	36	18.0
Mother Education	Illiterate	48	24.0
	Read & write	101	50.5
	Pre & secondary school	37	18.5
	University and more	14	7.0
Mother Occupation	Don't work	48	24.0
	Work	152	76.0
Kind of mother who works (N=152)	Teacher & Instructor	99	49.5
	Employer	28	14.0
	Private work	24	12.0
	Agriculturalist	0	0.0
	Trader	1	0.5
Marital Status	Single	74	37.0
	Currently married	27	13.5
	Widow	11	5.5
	Divorced	88	44.0
Women Occupation	Student	55	27.5
	Housewife	145	72.5
Father Education	Illiterate	97	48.5
	Read & write	55	27.5
	Pre & secondary school	46	23.0
	University and more	2	1.0
Father Occupation	Professional	36	18.0
	Employee	14	7.0
	Worker	70	35.0
	Farmer	47	23.5
	Trader	33	16.5

*Items not mutually exclusive

Table (2): Female satisfactory score level of knowledge pre- and post-planned nursing educational program ($n=200$).

old. Nearly all had siblings, and the third birth order was the most common. About half of the mothers could read and write, and most were employed, mainly as teachers. Almost half of the women were divorced, and most participants were housewives. Fathers were largely illiterate, with workers and farmers being the predominant occupations. Around 41% of families reported having a sufficient income, while 57% lived in overcrowded conditions, reflecting a diverse range of descriptive backgrounds.

3.2 Knowledge Pre- and Post-Planned Nursing Educational Program of the Female: -

Table 2 shows that the proportion of students with satisfactory knowledge increased substantially post-program. For example, knowledge of the female internal reproductive system increased from 19.7% pre-program to 65.7% post-program, and the total satisfactory score for early marriage increased from 9.5% to 90.5% ($p < 0.001$).

3.3 Perception Pre- and Post-Planned Nursing Educational Program of the Female: -

Table 3 depicts marked improvements in students' perceptions. For instance, agreement on "infant death because of early marriage" increased from 15.5% pre-program to 83% post-program, while agreement on "family and domestic violence" increased from 5% to 76.5% ($p < 0.001$).

3.4 Association Between Female Knowledge and Descriptive Characteristics

Table 4 indicates that satisfactory knowledge was higher among 16-year-old adolescents (77.3%) and those whose mothers could read and write (70.3%). Age, parental education, and occupation were significantly associated with adolescents' knowledge ($p < 0.05$).

3.5 Association Between Female Perception and Descriptive Characteristics

Table 5 illustrates that Positive perception was higher among 16-year-old adolescents (74.5%) compared to 14-year-olds (52.2%) and 15-year-olds (50%). Additionally, students whose mothers were teachers or employers demonstrated the highest positive perception (87.9–100%). Significant associations were observed with age, maternal education, and occupation, as well as paternal education and occupation ($p < 0.05$).

3.6 Association Between Female Total Knowledge and Perception Post Planned Nursing Educational Program: -

Effect of Planned Nursing Educational Program on Female Adolescents' Knowledge and Perception Regarding Early Marriage

	Post-program Knowledge				X ²	p
	Unsatisfactory		Satisfactory			
	N	%	N	%		
Student's age						
14-years (76)	40	52.6	36	47.4	16.192	0.000*
15-years (36)	16	44.4	20	55.6		
16-years (88)	20	22.7	68	77.3		
Mother Education						
Illiterate (48)	22	45.8	26	54.2	9.862	0.043*
Read & write (101)	30	29.7	71	70.3		
Pre & secondary school (37)	20	54.1	17	45.9		
University and more (14)	8	57.1	6	42.9		
Kind of a mother working						
Don't work (48)	15	31.3	33	68.7	11.477	0.043*
Teacher & Instructor (152)	65	42.8	87	57.2		
Father Education						
Illiterate (97)	48	49.5	49	50.5	10.626	0.031*
Read & write (55)	28	50.9	27	49.1		
Pre & secondary school (46)	20	43.5	26	56.5		
University and more (2)	4	28.6	10	71.4		
Type of father working						
Professional (36)	10	27.8	26	72.2	10.723	0.029*
Employee (14)	6	42.9	8	57.1		
Farmer (70)	20	28.6	50	71.4		
Trader (47)	15	31.9	32	68.1		
Other (33)	12	36.4	21	63.6		

*Items not mutually exclusive
p value <0.001 ** HS

Table (5): Association between female total perception post planned nursing educational program and descriptive characteristics (n=200).

Items	Post program total perception				X ²	p
	Negative		Positive			
	N	%	N	%		
Student's age						
14-years	44	47.8	48	52.2	9.046	0.029*
15-years	18	50.0	18	50.0		
16-years	28	25.5	82	74.5		
Parents' descriptive characteristics						
Mother Education						
Illiterate	22	45.8	26	54.2	11.6	0.021*
Read & write	26	51.0	25	49.0		
Pre & secondary school	8	21.6	29	78.4		
University & more	2	14.3	12	85.7		
Kind of a mother working						
Don't work	24	50.0	24	50.0	12.127	0.033*
Teacher & Instructor	12	12.1	87	87.9		
Employer	0	0.0	28	100.0		
Private work	3	12.5	21	87.5		
Agriculturalist	0	0.0	0	0.0		
Trader	1	100.0	0	0.0		
Father Education						
Illiterate	27	27.8	70	72.2	12.425	0.014*
Read & write	15	27.3	40	72.7		
Pre & secondary school	18	39.1	28	60.9		
University & more	2	100.0	0	0.0		
Type of father working						
Professional	10	27.8	26	72.2	13.250	0.010*
Employee	5	35.7	9	64.3		
Worker	20	28.6	50	71.4		
Farmer	18	38.3	29	61.7		
Trader	12	36.4	21	63.6		

*Items are not mutually exclusive
p value <0.001 ** HS

Table (6): Association between 'total knowledge and perception post planned nursing educational program (n=200).

Knowledge	Perception				X ² (P)	
	Negative		Positive			
	N	%	N	%		
Unsatisfactory	45	56.3	35	43.8	47.512	<0.001**
Satisfactory	33	20.6	87	79.4		

p value <0.001 **HS

Items	Preprogram		Post program		X ²	p-value
	Satisfactory Knowledge		Satisfactory Knowledge			
	No	%	No	%		
Reproductive system						
Anatomy of the male internal	27	19.7	90	65.7	59.203	<0.001**
Anatomy of the male external	35	25.5	89	65	42.956	<0.001**
Reproductive health concept	37	27	100	73	19.681	<0.001**
Importance of reproductive health	49	35.8	95	69.3	30.971	<0.001**
Reproductive health purposes	44	32.1	126	92	104.207	<0.001**
Total	27	19.7	110	80.3	135	<0.001**
Early marriage						
Early marriage definition	44	32.1	137	100	140.785	<0.001**
Legal marriage age	40	29.2	136	99.3	146.404	<0.001**
Optimal age for first pregnancy	29	21.2	134	97.8	166.962	<0.001**
Appropriate period between	13	9.5	131	95.6	203.802	<0.001**
Early marriage causes	39	28.5	122	89.1	103.753	<0.001**
Early marriage advantages	76	55.5	131	95.6	59.763	<0.001**
Early marriage disadvantages	44	32.1	133	97.1	126.411	<0.001**
The law forbidding early marriage	19	13.9	109	79.6	118.761	<0.001**
Total	13	9.5	124	90.5	217	<0.001**

*Items not mutually exclusive
p value <0.001 ** HS

Table (3): Female perception pre- and post-planned nursing educational program (n=200).

Items	Pre-Program			Post-Program			X ²	p-value
	Agree (%)	Sometimes (%)	Disagree (%)	Agree (%)	Sometimes (%)	Disagree (%)		
	Adverse physical health consequences of early marriage							
Death	15.5	22.5	62.0	83.0	13.0	4.0	139	<0.001**
Alcohol death	12.5	28.5	59.0	73.0	21.0	6.0	120	<0.001**
Health problems	24.0	21.0	55.0	70.0	18.0	12.0	69.3	<0.001**
Mental disturbance	14.5	18.0	67.5	84.0	12.5	3.5	146	<0.001**
Acute issues with children	5.0	19.0	76.0	67.0	26.0	7.0	154	<0.001**
Psychological health consequences of early marriage								
Acute issues	14.0	17.0	69.0	76.0	22.0	2.0	146	<0.001**
Acute issues	11.5	26.5	62.0	80.0	12.5	7.5	136	<0.001**
Acute issues	13.0	36.5	50.5	66.5	31.5	2.0	110	<0.001**
Social health consequences of early marriage								
Acute issues and domestic	5.0	14.0	81.0	76.5	16.5	7.0	173	<0.001**
Acute issues	12.5	19.5	68.0	81.5	16.0	2.5	155	<0.001**
Acute issues	5.5	25.5	69.0	73.0	19.5	7.5	147	<0.001**
Acute issues	7.5	19.0	73.5	86.0	5.5	8.0	173	<0.001**
Acute issues	4.5	36.5	59.0	82.5	14.5	3.0	179	<0.001**
Acute issues	2.0	35.0	63.0	81.0	14.0	5.0	182	<0.001**
Acute issues	1.5	22.5	76.0	75.0	19.0	6.0	180	<0.001**
Acute issues	6.5	25.0	68.5	67.0	30.5	3.0	154	<0.001**
Acute issues	4.5	17.0	78.5	79.5	17.5	3.0	189	<0.001**
Acute issues	6.5	27.0	66.5	0.0	2.0	98.0	46.1	<0.001**

*Items not mutually exclusive
p value <0.001 ** HS

Table (4): Association between female total knowledge post planned nursing educational program and descriptive characteristics (n=200).

Effect of Planned Nursing Educational Program on Female Adolescents' Knowledge and Perception Regarding Early Marriage

adolescent health knowledge. The findings of the present study reflected that the parents' education and occupation affect female students' readiness to preserve and promote their health. This should work as a motive for parents to increase their awareness because they should be the main source of knowledge for their children.

These findings are in the same line with **Gebeyehu et al. (2023)**, who found that lower than the findings in Ethiopia's country-wide finding, which was 82%, Amhara region, which was 66.5% among rural residents, and West Gojjam (96%). Among girls married before age 15, 63% had parents with no education. This comes in agreement with a study by **Handebo et al. (2023)**, who found in the studied sample that their age ranged between 16 and 17 years old. One-third of mothers can't read and write, and many of them weren't working, while the majority of fathers had a primary education and were working.

Overall, the program's effectiveness was evident through highly significant improvements across all measured outcomes ($P < 0.001$), confirming the value of health education in promoting adolescent well-being. These results are in line with studies by **Burgess et al. (2022)**, **Adola & Wirtu (2024)**, and others, who emphasized that planned interventions lead to improved knowledge, and attitudes, regarding reproductive and marital health. All these results confirm that giving health education to female adolescents can help improve their knowledge, and perception, subsequently leading to health promotion and prevention. This accentuates that the health prevention program applied through health education in the present study was useful.

6. Implications for Nursing Practice

Our findings may have several practical implications. Planned nursing educational

- First, this research discovered the impacts of early marriage, a topic that has been largely overlooked on a global scale, particularly in Egypt, where limited studies exist. The findings may offer foundational data for the region under investigation. The comparison of knowledge and perception before and after the implementation of the prevention program indicated that most participants lacked awareness of suitable health knowledge before the program's execution. Conversely, following the

Table (7): Association between total mean score for knowledge, and perception pre- and post-planned nursing educational program (N=200).

Items	Pre (Mean ± SD)	Post (Mean ± SD)	Student's t-test	p-value
Total Knowledge Score	12.7 ± 3.3	28.6 ± 8.2	21.126	<0.001**
Total Perception Score	28.3 ± 7.7	54.2 ± 7.9	27.286	<0.001**

*p value <0.001 ** HS*

5. Discussion

Early marriage continues to pose significant biopsychosocial and developmental challenges in the Arab region, particularly in rural areas where it remains more prevalent (**Enweonwu, 2024; Elnakib et al., 2025**). Our research demonstrated that the planned nursing educational program significantly enhanced female adolescents' knowledge and perceptions related to early marriage and reproductive health.

The findings revealed a substantial improvement in students' knowledge of the female reproductive system and early marriage post-intervention, consistent with prior studies conducted in Ethiopia, Saudi Arabia, and Egypt (**Erulkar & Muthengi, 2009; Ibrahim et al., 2017; Putri & bin Sansuwito, 2025**). Similar improvements were observed in perception, where post-program implementation led to a significant shift toward negative views of early marriage and increased awareness of its adverse consequences (**Handebo et al., 2023; Seta, 2023; Adola & Wirtu, 2024**).

Pre-intervention, only a minority had positive perceptions of early marriage prevention strategies. Post-intervention, most students demonstrated improved understanding and support for preventive measures, aligning with findings from **Ahmed and Elsayed (2021)**. Students also reported greater awareness of the physical, psychological, and social harms of early marriage, confirming earlier results by **Burgess et al. (2022, 2023)**, **Khan et al. (2024)**, and **Seta (2023)**.

Statistically significant associations were observed among students' knowledge, perception, and descriptive aspects such as age, parental education, and occupation. These results contradict the findings of **Pourtaheri et al. (2024)**, who found no significant relationships in a similar context, but support the observations of **Khan et al. (2024)**, who reported a significant link between parental education and

Effect of Planned Nursing Educational Program on Female Adolescents' Knowledge and Perception Regarding Early Marriage

There was a highly significant difference between the pre- and post-program implementation ($P < 0.001$), with a minority of students having a positive perception of early marriage health consequences and its preventive measures before program implementation, compared to over two-thirds of them after the program.

Author Contributions: Abobaker R. Belal S, contributed to the conceptualization and methodology of the study. Ahmed A. , Saber A. was responsible for the study design, as well as data collection. Salem N. shared in methods and processing. Mohamed N. handled data analysis and interpretation. Abobaker R. participated in the literature review and writing of the manuscript. Hassan Gh, Belal S. contributed to the literature review and writing. Fadlalmola H was responsible for data collection and data analysis.

Acknowledgments

The authors were grateful to the schoolchildren and their parents in Damanhour Governorate, Egypt, for their participation.

Ethics Statement

The Research Ethics Committee-Faculty of Nursing at Damanhour University provided ethics permission (Reference no: Date: March /2025; ID/Zu. Research code: 110-k).

Conflicts of Interest

No conflicts of interest are disclosed by the researchers.

Data Availability Statement

The data supporting this study's results are accessible from the corresponding author upon reasonable request.

program, a significant number of participants reported adopting healthier practice patterns, with results showing a highly statistically significant difference.

- The planned nursing educational program regarding early marriage described a notable enhancement in the participants' knowledge, and perception, about the health risks and their consequences.

7. Limitations and Recommendations

The research conclusions emphasize the following suggestions:

Improve adolescent knowledge of the negative health effects of early marriage by:

- a. Applying health education programs to students in various educational settings, emphasizing the health consequences of early marriage and implementing hands-on training courses particularly for female students regarding nutrition, personal hygiene, and physical activity during menstruation.

- b. Maternity nurses should educate female students about these issues and improve their perspective to prevent them from getting married young and becoming pregnant.

- c. For the community to avoid falling into that circumstance, the mass media is important in increasing awareness about early marriage and pregnancy.

- d. The subjects of reproductive health should be taught in schools and universities, with an emphasis on the negative health effects of early marriage and ways to avoid them.

Conclusion

The study concluded the following after considering the findings and answering the research hypothesis, which included that:

The mean age of the study sample was 14.7 ± 0.566 years, with a range of 14–16 years. The knowledge, perceptions, and health habits of female students regarding the health effects of early marriage varied significantly before and after the program was implemented.

Before the program, most students knew very little about the female reproductive system, menstruation, early marriage, nutrition, personal hygiene, and physical activity; however, after the program, they were able to, with a very statistically significant difference between before and post-program implementation ($P < 0.001$), and almost two-thirds of them possessed adequate knowledge.

Effect of Planned Nursing Educational Program on Female Adolescents' Knowledge and Perception Regarding Early Marriage

10. El-Kady, R. (2025). Early Marriage as a Model of Child Trafficking: Exploring the Legal Safeguards for Victims. In *Social, Political, and Health Implications of Early Marriage* (pp. 291–326). IGI Global Scientific Publishing.
11. Elnakib, S., Ali, A. K., Mieth, K., & Chandra-Mouli, V. (2025). Mapping the evidence on interventions that mitigate the health, educational, social, and economic impacts of child marriage and address the needs of child brides: A systematic scoping review. *Sexual and Reproductive Health Matters*, (just accepted), 1–38.
12. Elsayed, R., & Zembe-Mkabile, W. (2024). Women's access to sexual and reproductive health services and information in Ismailia, Egypt. *BMC Women's Health*, 24(1), 163.
13. Enweonwu, E. (2024). *International Law and the End of Child Marriage: A Case Study of Nigeria* (Doctoral dissertation, Birmingham City University).
14. Gebeyehu, N. A., Gesese, M. M., Tegegne, K. D., Kebede, Y. S., Kassie, G. A., Mengstie, M. A., ... & Adella, G. A. (2023). Early marriage and its associated factors among women in Ethiopia: Systematic reviews and meta-analysis. *PloS One*, 18(11), e0292625. <https://doi.org/10.1371/journal.pone.0292625>
15. Gidmark, T. (2025). Bound by Floodwaters: A quantitative analysis examining the impact of natural disasters has on the age of marriage in Mozambique.
16. Handebo, S., Demie, T. G., Gessese, G. T., Woldeamanuel, B. T., & Biratu, T. D. (2023). Effect of women's literacy status on maternal healthcare services utilization in Ethiopia: A stratified analysis of the 2019 mini-Ethiopian Demographic and Health Survey. *BMJ Open*, 13(11), e076869. <https://doi.org/10.1136/bmjopen-2023-076869>.
17. Hailu, B.A., Beyene, J. (2025). Adolescent marriage, maternity, and limited access to education in 106 countries: Bayesian analysis of prevalence, trend, and prediction. *Scientific Reports*. 15(9584). <https://doi.org/10.1038/s41598-025-93893-7>.
18. HENDY, R. (2024). The State of Marriage in Egypt. In *The Handbook of Marriage in the Arab World* (pp. 263–305). Springer Nature Singapore.
19. John, N. A., Kapungu, C., Seban, M., & Tadesse, S. (2023). Do gender-based pathways influence mental health? Examining the linkages between early child marriage, intimate partner

References

1. Abd-El-Kareem Hegazy, M., & Nasr-El-Deen Elsadek, A. (2019). Early Marriage and Associated Health Consequences among Female Children in Giza Governorate. *Egyptian Journal of Health Care*, 10(1), 420–435.
2. Adola, S. G., & Wirtu, D. (2024). Effects of early marriage among women married before reaching 18 years old (qualitative study approach). *Frontiers in Sociology*, 9, 1412133.
3. Ahmed, A. L., & Elsayied, H. A. (2021). Knowledge of female preparatory students regarding early marriage and health consequences. *International Egyptian Journal of Nursing Sciences and Research*, 2(1), 7–10.
4. Anzari, P. P., & Fitri, R. (2024). Empowering Women's Leadership Through Community Mobilization to Prevent Early Marriage. *KnE Social Sciences*, 221–238.
5. Banerjee, P., Pillai, S., & Chakravarty, J. (2024). A Descriptive Study to identify the determinants and assess knowledge of married women regarding the Biosocial consequences of early marriage in selected rural areas of Bhilai (CG). *Asian Journal of Nursing Education and Research*, 14(1), 12–16.
6. Berliana, S. M., Kristinadewi, P. A. N., Rachmawati, P. D., Fauziningtyas, R., Efendi, F., & Bushy, A. (2021). Determinants of early marriage among female adolescents in Indonesia. *International Journal of Adolescent Medicine and Health*, 33(1).
7. Burgess, R. A., Jeffery, M., Odero, S. A., Rose-Clarke, K., & Devakumar, D. (2022). Overlooked and unaddressed: A narrative review of mental health consequences of child marriages. *PLOS Global Public Health*, 2(1), e0000131. <https://doi.org/10.1371/journal.pgph.0000131>
8. Burgess, R. A., Sheibani, F., Kelly, I., Jeffery, M., Gumbonzvanda, F., Lewis, G., & Gumbonzvanda, N. (2023). Bringing an end to the silence: identifying priorities and solutions to addressing the mental health consequences of child marriage. *Health Policy and Planning*, 38(4), 421–434.
9. Chandel, A., Yadav, M., & Hung, T. H. (2025). Social and Economic Consequences of Early Marriage on Women's Education and Workforce Participation. In *Social, Political, and Health Implications of Early Marriage* (pp. 261–290). IGI Global Scientific Publishing.

Effect of Planned Nursing Educational Program on Female Adolescents' Knowledge and Perception Regarding Early Marriage

factors of girl child marriage: A meta-synthesis of qualitative research. *BMC Public Health*, 24(1), 428. <https://doi.org/10.1186/s12889-023-17626-z>.

25. Seta, R. (2023). Child marriage and its impact on health: A study of perceptions and attitudes in Nepal. *Journal of Global Health Reports*, 7, e2023073.

26. Shukla, S., Ezebuihe, J. A., & Steinert, J. I. (2023). Association between public health emergencies and sexual and reproductive health, gender-based violence, and early marriage among adolescent girls: A rapid review. *BMC Public Health*, 23(1), 117.

27. Sütülü, S., & Kutlu, Ö. (2025). Early Marriage from a Health Perspective: Risks and Intervention Strategies. In *Social, Political, and Health Implications of Early Marriage* (pp. 213–236). IGI Global Scientific Publishing.

28. Thompson, S. K. (2012). *Sample Size*. Wiley Series in Probability and Statistics. John Wiley & Sons.

29. Whitman, A., De Lew, N., Chappel, A., Aysola, V., Zuckerman, R., & Sommers, B. D. (2022). Addressing social determinants of health: Examples of successful evidence-based strategies and current federal efforts. *Off Heal Policy*, 1, 1–30.

violence, and psychological well-being among young Ethiopian women (18–24 years old). *Youth & Society*, 55(6), 1155–1172.

20. Kanji, S., Carmichael, F., Darko, C., Egyei, R., & Vasilakos, N. (2024). The impact of early marriage on the life satisfaction, education, and subjective health of young women in India: A longitudinal analysis. *The Journal of Development Studies*, 60(5), 705–723.

21. Khan, M. N., Khanam, S. J., Khan, M. M. A., Billah, M. A., & Akter, S. (2024). Exploring the impact of perceived early marriage on women's education and employment in Bangladesh through a mixed-methods study. *Scientific Reports*, 14(1), 21683.

22. Lassi, Z. S., Rahim, K. A., Stavropoulos, A. M., Ryan, L. M., Tyagi, J., Adewale, B., ... & Ali, M. (2024). Use of contraceptives, empowerment, and agency of adolescent girls and young women: A systematic review and meta-analysis. *BMJ Sexual & Reproductive Health*, 50(3), 195–211.

23. Nhampoca, J. M., & Maritz, J. E. (2024). Early marriage, education, and mental health: Experiences of adolescent girls in Mozambique. *Frontiers in Global Women's Health*, 5, 1278934.

24. Pourtaheri, A., Mahdizadeh, M., Tehrani, H., Jamali, J., & Peyman, N. (2024). Socio-ecological