Assessment of female adolescent Reproductive health needs in Assiut city

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Abstract: Adolescents around 17million in Egypt (2005) have different needs and require different counseling approaches and more information. Adolescence is a critical stage for risk-taking because adolescents are moving toward independence and tend to experiment and test limits**. Aim of this study**: was to determine the problems of female adolescents, and provide information about reproductive health. **Subject and methods**: Cross-sectional analytic study was conducted in nursing secondary schools and technical institutes in Assiut city in Upper Egypt with total number of 514 adolescent female students which are recruited. The data were collected through a self-administered questionnaire sheet and a physical assessment sheet. **Results**: The study revealed that 94.6% of the girls were circumcised, and 98.2% had their menarche. Overall, 65.5% had satisfactory knowledge, and 81.5% had positive attitude. The main sources of information were classroom whereas parents, newspapers, and magazines were less reported. There was a statistical significance difference between knowledge and had circumcision ($p=0.002$), also, between knowledge about reproduction and their related attitudes and beliefs ($p<0.001$). **Conclusion**: unmet information needs were related to female genital mutilation, family planning, pregnancy and labor, and the preferred sources are school book, media, and parents. **Recommendations:** It is recommended that the unmet needs identified should be used for development of educational programs for adolescents. The role of the parents, as well as health care providers needs to be fostered through using of multimedia as television and radio.

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1. Introduction:

Adolescents are inherently different from adults and therefore have different needs because they are less developed physically and psychologically; they have different cognitive abilities and skills, which requires different counseling approaches and takes more time; they tend to be less well informed and therefore require more information; conflicts between culture or parental expectations and the adolescents' emerging values present serious challenges for them; and they are in a transitional state and are not sure where they fit in ***(Carrera, 2006)***.

Adolescence is a critical stage for risk-taking because adolescents are moving toward independence and tend to experiment and test limits, including practicing risky behaviors; substance or drug use typically occurs for the first time during adolescence; sexual experiences (not always voluntary) usually begin during adolescence; consequences of risky behaviors can have serious and long-term effects; adolescents are experiencing pressures from peers, family, society, and the community; and adolescents are easily influenced ***(Eaton et al., 2010)***.

Adolescence is an opportunity time for professional interventions because health education can be integrated into school, home, and religious activities; life-long health habits are established during adolescence; interventions can help adolescents make good decisions and take responsibility for their actions, often preventing serious negative consequences in the future; and there are many effective channels for reaching adolescents such as, through schools, religious institutions, youth organizations, community and recreational activities, parental communication, peer education, the media, and health service facilities ***(Brener et al., 2006; Manlove et al., 2009)***.

Nearly half of the world population and 63 per cent in the least developed countries are currently below age 25, meaning that a large contingent of people will be entering reproductive life in the near future. The population classified as youth, between ages 15 and 24, is estimated to be 1 billion and it comprises nearly 18 per cent of the world population, approximately 14 percent of the population in the more developed regions and nearly 19 per cent of the population in the less developed regions. A large majority of the world's youth lives in less developed regions: 61 percent in Asia, in Egypt around17 million person at age of adolescent***(Brown and Suellentrop, 2009)***.

Very early, adolescents' reproductive rights have been defined as those rights that grant access to

reproductive health information and services, and rights that enable young people to decide freely and responsibly on all aspects of one's sexuality. This includes making informed decisions about sexual expression, relationships, and whether or when to have sex and whether or when to have children. These rights are or should be supported by policies that facilitate access to quality reproductive health information and services for all youth ***(Kelly and Schwartz, 2007)***.

The influence of the family environment on young people's onset of sexual activity is also increasingly acknowledged ***(Munthali et al., 2006)***. Parents and other family members usually play a central role in shaping youth's knowledge, values and attitudes, including those related to sexual and reproductive health. Several studies have documented the influential role of family stability, father's presence in the household and parent-teen communication on the timing of sexual initiation and the reductin of risk-taking behavior ***(Räsänen, 2009)***.

Aim of the study:

The aim of the present study was to determine the problems of female adolescents, and to provide information about reproductive health among them.

Subjects and Methods

Research design& Setting

A cross-sectional analytic research design was used in carrying out the study. It was conducted in nursing secondary schools and technical institutes in Assiut city in Upper Egypt.

Subjectsand Sample size:

The subjects of this study consisted of 514 female adolescents in nursing secondary schools and technical institutes in Assiut city.

The sample size was estimated to determine an expected satisfactory knowledge rate among adolescent girls of 50% or more, with 5% absolute precision and 95% level of confidence. Using the single proportion equation for dichotomous variables:

$$n = \frac{(z_{\alpha/2})^2 p(1-p)}{D^2}$$

Where:

n = sample size

p = 0.50

D = 0.50 x10% = 0.05

The estimated sample size is 384 subjects. After adjustment for a dropout rate of 25%, the sample size was increased to 514.

Fieldwork

Data collection was carried out over a period of four months, from February 2007 to May 2007. After obtaining official approvals, the researcher visited the study settings and met with the headmasters to explain the purpose and procedures of the study. This was followed by recruitment of students from various school grades. The researcher met with them and explained the purpose of the study, the components of the tool, and how to answer the questions. Filling the questionnaire took from 25 to 30 minutes for each student. The researcher was present to answer any questions.

Data collection tool

The data of this study were collected using a self-administered questionnaire sheet and a physical assessment sheet.

Self-administered questionnaire developed by the researcher based on review of pertinent data. The tool was reviewed by nursing and medical experts in obstetrics and gynecology reproductive health, as well as community health. The finalized tool included the following parts:

1st part: Socio-demographic 2nd part : history of circumcision, age, and associated complications, 3rd part: Menstrual history, age at menarche, and 4th part: Knowledge about reproductive health. After completion of the questionnaire, each student was examined using the physical assessment form. Weight and height and pelvic girth were measured according to standard methods ***(Larsson et al., 1984, Himes and Dietz, 1994)***. This was followed by assessment of the vital signs. A special room was prepared in the school for physical assessment by the researcher in special room in order to ensure privacy.

Scoring:

For the knowledge items, 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 60% or more and unsatisfactory if less than 60%.

Physical assessment sheet: developed by the researcher to record the physical examination findings. These included:

Anthropometric measurements: weight and height to calculate to body mass index (BMI) as kg/m^2 height, and pelvic girth by tape measure

Vital signs: pulse, respiration, blood pressure.

Pilot study

After development and validation of the tools, a pilot study was conducted on 50 adolescent girls representing about 10% of the sample size. Its purpose was to test the feasibility of the tools, and to identify any problems related to sequence and clarity of the questions. It also helped the researcher to estimate the time needed to fill the forms. The pilot study findings showed that the questions were clear and relevant, but some wording was modified to increase clarity. The tools were finalized and made ready for use based on the pilot study findings.

Ethical considerations

All principles of ethics in research were followed in carrying out the study. The study protocol was approved by pertinent committees. The purpose of the study was explained to participants, and their written consent to participate in the study was obtained. They were informed about their right to refuse participation, or to withdraw at any time with no reason to be given. They were assured that the information would be totally confidential and used for research purpose only. The questionnaire forms were anonymous. Professional help was provided in case of need. if any of them had a problem referral are done.

Limitations of the study

Some students were reluctant to participate for fear that the questionnaire would affect their academic evaluation. They were convinced about confidentiality, and the forms were anonymous. Others were embarrassed of having the physical assessment, but securing a private place for examination solved the problem.

IV. Statistical Design

Data entry and statistical analysis were done using SPSS 14.0 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. Statistical significance was considered at p-value <0.05.

3. Results:

Table (1): describes the socio-demographic characteristics of adolescent girls in the study sample. Their mean age was 16.2±1.1 years, and the highest percentage was in the age category 16 to <17 years (34.0%). Slightly more than half of them (54.3%) had urban residence. The highest percentage was in first and second secondary years (37.9% and 36.2%, respectively). The majority mentioned that the curriculum covered information about reproduction (92.2%). Regarding parents' socio-demographic characteristics shows that about one-fifth of the fathers (20.6%) and slightly less than half of the mothers (47.7%) were illiterate. Meanwhile, only 5.8% of the fathers and 1.8% of the mothers had university education. About two-thirds of the fathers were manual workers (64.2%), whereas the majority of the mothers were housewives (88.7%).

Table (2): demonstrates that the majority of the studied girls were circumcised (94.6%). The age at circumcision varied between less than one to 17 years, with a mean 8.8±2.7 years. He majority of the circumcised girls reported having had related acute problems (86.0%).and done by physician at clinic

Table (3): shows that almost all studied girls had their menarche (98.2%). The cycle was mostly regular (65.5%), with duration of 28 to 30 days (70.7%), three to four days menstrual period (72.5%), and an average number of pads (78.0%). The majority knew that the age at menarche ranged between 12 and less than 16 years (89.1%). As regards the beliefs related to things to be avoided during menses, the majority mentioned prayer (92.2%), followed by Ramadan fast (72.8%) and sexual intercourse (53.7%). Meanwhile, the majority (94.7%) were bathing during menses. Only less than half of the sample had correct knowledge about the time of ovulation (48.4%). In total, 42.6% of the girls had correct knowledge about menstruation, and slightly less than half of them (49.8%) had related positive attitude.

Figure (1): describes the prevalence of menstrual pain in the study sample. It indicates that more than half of the girls had moderate pain (54.5%).

Figure (2): demonstrates that school book was the main source (85.6%), followed by educational media (15.6%). Only 12.8% mentioned parents as sources of information.

Table (4): illustrates the anthropometric measurements of the studied girls. Concerning BMI, it indicates that the majority (70.2%) were normal. Meanwhile, 11.7% and 3.5% were respectively overweight and obese. Meanwhile, slightly less than half of the sample had their girth 90 to less than 100 cm, with a mean 96.0±12.1 cm.

Table (5): illustrated that the majority reported having seen a related diagram (97.9%), mostly in anatomy books (96.2%). Slightly less than half of the sample (45.9%) has correctly mentioned five female genital organs. However, 3.3% of the girls could not name any organ. The table also shows that the highest

percentage of the girls could correctly mention only one part of the vulva (38.5%), and 23.0% correctly mentioned its four parts. The majority had correct knowledge about the location of the female genitalia (90.1%), and the site of implantation (96.1%). Conversely, only one-third correctly knew the source of the menstrual blood (33.3%), and about two-fifth correctly knew the site of sexual intercourse (41.8%). Overall, slightly less than half of the girls had satisfactory knowledge (48.1%).

Table (6): showed that the majority had positive attitude towards age for marriage (90.3%), and pregnancy spacing (79.8%). For the majority of girls, breastfeeding should be two years (89.1%). Overall, slightly more than three-fourth of them had satisfactory knowledge about marriage (75.3%), and 58.0% had related positive attitudes and beliefs.

Table (7): illustrated that the majority knew that diseases could be transmitted by sexual relations (99.4%). The main complications mentioned were infertility (51.0%), followed by urinary tract infection (48.1%), and vaginal secretions (44.2%). The table also shows that the majority (98.8%) knew about AIDS, its manifestations (74.5%), lack of treatment (87.7%), and possible mother-fetal transmission (97.5%). Also, almost all studied girls agreed upon the importance of premarital counseling (98.4%). In total, slightly more than half of the girls (54.1%) had satisfactory knowledge about STDs, and the majority (98.4%) had related positive attitude.

Table (8): showed the majority had correct knowledge about contraceptive pills (96.1%), IUD (92.8%), and other family planning methods (90.7%). Conversely, only 14.4% of them had correct knowledge about the effectiveness of IUD. In total, about three-fourth of the girls had satisfactory knowledge about family planning (74.1%).

Information needs and preferred sources

Table (9): Concerning studied girls' information needs, Table 19 shows that slightly more than half of them (54.7%) have expressed such need. The needed information was mostly for FGM (38.4%), followed by family planning (7.8%), and pregnancy and labor (6.4%). The lowest needs were related to male genital system (0.7%), and male contraception (0.4%). The preferred sources of information were mainly school book (75.5%), educational media (21.2%), and parents (14.4%).

4. Discussion

The adolescence is a period of preparation for adulthood. During this time several key developmental tasks are undertaken. These include physical and sexual maturation, movement toward social and economic independence, and the development of identity. Behavior patterns established during this process, such as drug use or non-use and sexual risk taking or protection can have a long-lasting positive or negative impact on future health and wellbeing. As a result, it is during this process that providers can have the greatest impact on helping young people establish healthy behaviors (Coyle *et al.,* 2003).

The study was carried out on a sample of adolescent girls with age ranging between 14 and 20 years. This age range covers the middle and late adolescence stages as defined by the NCERT (1999). Accordingly, the mid adolescence stage is between 14 and 15 years, and is characterized by the development of a separate identity from family, and tendency to more relationships with peer groups and other sex. The stage of late adolescence is between 16 and 19 years, and is characterized by full physical development, and clear separate identity. Therefore, these stages are more suitable for assessment of issues related to reproductive health.

Slightly more than half of the girls in the present study were from urban areas. This provides a good mix of a sample representing both urban and rural communities, which have different perceptions regarding reproductive health issues. They were selected from nursing schools and institutes for two main reasons. Firstly, they must have better knowledge about reproductive health issues compared to girls in other educational sectors. In support of this, the great majority of them confirmed that their school curricula covered information regarding reproduction. Secondly, their future career implies that they themselves will have the role of educating adolescents regarding health in general, and reproductive health in particular. Therefore, it was deemed important to assess their related knowledge and beliefs.

The description of the socio-demographic characteristics of the parents of the present study adolescent girls is of great importance in shaping their knowledge and beliefs regarding reproductive health. It was found that one-fifth of the fathers about half of the mothers were illiterate. Also, most of the fathers were manual workers, while the majority of the mothers were housewives. These characteristics indicate a low socio-economic level, which will have its repercussions on the study findings as will be shown.

Table 1. Socio-demographic and educational characteristics of adolescent girls and their parents in the study sample (n=514)

Socio-demographic and educational characteristics	Frequency	Percent
Age (years):		
<16	161	31.3
16-	175	34.0
17-	123	23.9
18+	55	10.7
Range	14-20	
mean±SD	16.2±1.1	
Residence:		
Urban	279	54.3
Rural	235	45.7
Nursing education level:		
1st secondary	195	37.9
2nd secondary	186	36.2
3rd secondary	114	22.2
Technical institute	19	3.7
Number of years of education:		
Range	9-14	
mean±SD	9.9±1.0	
Curriculum covers information about reproduction:		
No	40	7.8
Yes	474	92.2
Father education:		
Illiterate	106	20.6
Read/write & Primary	198	38.5
Preparatory& Secondary	190	35
University	30	5.8
Father job:		
Employee	130	25.3
Manual worker	330	64.2
Unemployed	54	10.5
Mother job:		
Housewife	456	88.7
Working	58	11.3
Mother education:		
Illiterate	245	47.7
Read/write & Primary	168	32.3
Preparatory& Secondary	94	18.3
University	9	1.8

Table 2. History of circumcision (FGM) among adolescent girls in the study sample (n=514).

	Frequency	Percent
Had circumcision:		
No	28	5.4
Yes	486	94.6
Age at circumcision in years (n=486):		
<5	28	5.8
5-	233	47.9
10+	225	46.3
Range	<1-17	
mean±SD	8.8±2.7	
Median	9	
Had acute problems (n=486)	418	86.0
Who did the circumcision	458	89.2
By physician or nurse		5.4
By daya	28	

Table 3. Menstrual history and knowledge, attitude & beliefs about menstruation among adolescent girls n the study sample (n=514)

Menstrual history and knowledge, attitude & beliefs about menstruation	Frequency	Percent
Had menarche:		
No	9	1.8
Yes	505	98.2
Age at menarche (years):		
<12	50	9.7
12-	458	89.1
16+	6	1.2
Regularity:		
Regular	331	65.5
Irregular	174	34.5
Things to be avoided during menses:		
Prayer	474	92.2
Ramadan fast	374	72.8
Sexual intercourse	276	53.7
Physical exercises	48	9.3
Going to church	46	8.9
Bathing during menstruation:	487	94.7
Correct time of ovulation	249	48.4
Knowledge about menstruation:		
Satisfactory (60%+)	219	42.6
Unsatisfactory (<60%)	295	57.4
Beliefs and attitudes related to menstruation:		
Positive (60%+)	256	49.8
Negative (<60%)	258	50.2

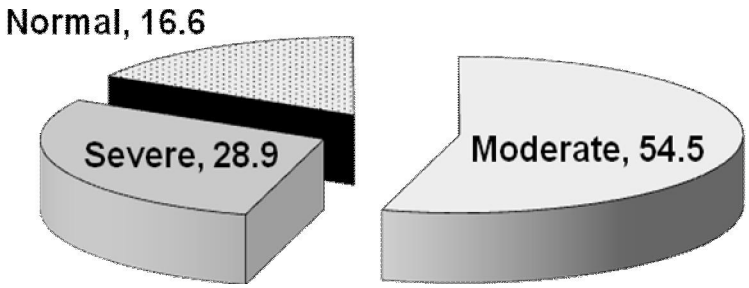

Figure 1. Prevalence of menstrual pain in the study sample (n=514).

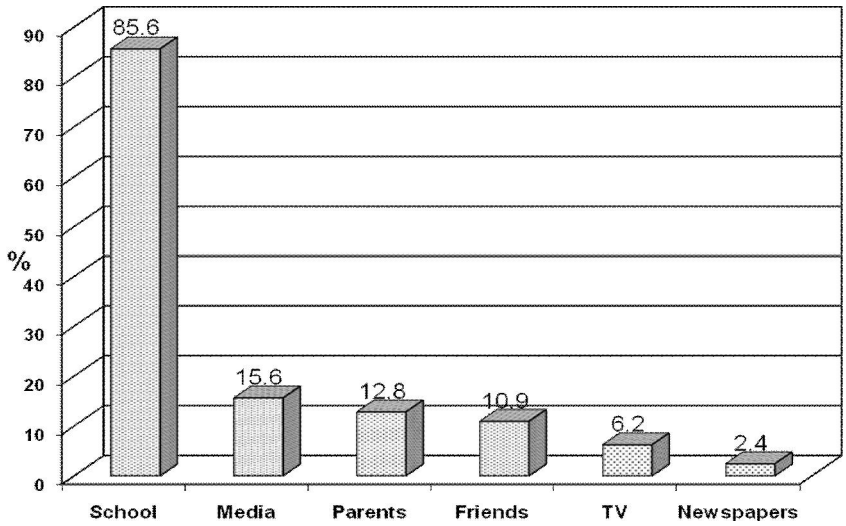

Figure 2. Sources of information about menstruation among adolescent girls in the study sample (n=514)

Table 4. Anthropometric measurements of adolescent girls in the study sample (n=514)

Anthropometric measurements	Frequency	Percent
BMI:		
<18.5 (underweight)	75	14.6
18.5- (normal)	361	70.2
25- (overweight)	60	11.7
30+ (obese)	18	3.5
Range	14.0-55.0	
mean±SD	22.1±4.5	
Girth (cm):		
<90	87	16.9
90-	242	47.1
100+	185	36.0
Range	34.0-151.0	
mean±SD	96.0±12.1	

Table 5. Knowledge about anatomy and physiology of female genital system among adolescent girls in the study sample (n=514)

Knowledge about anatomy and physiology of female genital system	Frequency	Percent
Had seen a diagram of female reproductive system:		
Saw diagram in (n=503):		
Anatomy book	484	96.2
School poster	2	0.4
Hospital poster	17	3.4
Correctly know:		
Location of female genitalia	463	90.1
Source of menstrual flow	171	33.3
Site of sexual intercourse	215	41.8
Site of ovum ready for fertilization	250	48.6
Number of fertilizable ova produced monthly	263	51.2
Site of fertilization (ovum and sperm)	262	51.0
Site of implantation	494	96.1
Total knowledge about anatomy/physiology of female system:		
Satisfactory (60%+)	247	48.1
Unsatisfactory (<60%)	267	51.9

Table 6. Knowledge, attitude, and beliefs about marriage and pregnancy among adolescent girls in the study sample (n=514)

Knowledge, attitude, and beliefs about marriage and pregnancy	Frequency	Percent
Appropriate age for marriage (years):		
Range	15-30	
mean±SD	20.3±1.9	
Median	20	
Positive attitude/ correct belief towards:		
Age for marriage	464	90.3
Pain during sexual intercourse	351	68.3
Bleeding in first marital sexual intercourse	380	73.9
Pregnancy spacing	410	79.8
Pain during labor	183	35.6
Duration of breastfeeding (years):		
<2	31	6.0
2	458	89.1
>2	25	4.9
total	458	89.1
Total knowledge about marriage and pregnancy:		
Satisfactory (60%+)	387	75.3
Unsatisfactory (<60%)	127	24.7
Beliefs and attitudes related to marriage and pregnancy:		
Positive (60%+)	298	58.0
Negative (<60%)	216	42.0

Table 7. Knowledge, attitude, and beliefs about sexually transmitted diseases (STDs) among adolescent girls in the study sample (n=514)

Knowledge/attitude/beliefs about sexually transmitted diseases (STDs):	Frequency	Percent
Correctly know:		
Diseases can be transmitted by sexual relations	511	99.4
Complications of STDs:		
Infertility	262	51.0
Urinary tract infection	247	48.1
Vaginal secretions	227	44.2
Death	180	35.0
Urinary secretions	119	23.2
Heart diseases	45	8.8
AIDS	508	98.8
Manifestations of AIDS	383	74.5
Lack of treatment for AIDS	451	87.7
Modes of transmission of AIDS:		
Sexual intercourse	483	94.0
Blood transfusion	392	76.3
Shared syringes	368	71.6
Transmission from mother to fetus	501	97.5
High-risk groups	316	61.5
Importance of pre-marital counseling	506	98.4
Total knowledge about STDs:		
Satisfactory (60%+)	278	54.1
Unsatisfactory (<60%)	236	45.9
Beliefs and attitudes related to STDs:		
Positive (60%+)	506	98.4
Negative (<60%)	8	1.6

Table 8. Knowledge about family planning among adolescent girls in the study sample (n=514)

Knowledge about family planning:	Frequency	Percent
Know about contraceptive pills (OCP)	494	96.1
Know the time of use of OCP	382	74.3
Know about IUD	477	92.8
Know duration of effectiveness of IUD	74	14.4
Site if IUD insertion	407	79.2
Local methods used by men	355	69.1
Other family planning methods	466	90.7
Permanent family planning methods for woman	377	73.3
Permanent family planning methods for men	241	46.9
Knowledge about family planning:		
Satisfactory (60%+)	381	74.1
Unsatisfactory (<60%)	133	25.9

Table 9. Information needs and preferred sources of information about reproductive health as reported by adolescent girls in the study sample (n=514)

	Frequency	Percent
Need more information about reproductive health:		
No	233	45.3
Yes	281	54.7
Information needed (n=281):[@]		
FGM	108	38.4
Family planning	22	7.8
Pregnancy and labor	18	6.4
Menstruation	17	6.0
Adolescence	13	4.6
Sexual intercourse	13	4.6
AIDS	13	4.6
Related religious issues	5	1.8
Premarital counseling	5	1.8
General information	3	1.1
Early marriage	3	1.1
Female genital system	3	1.1
Infertility	3	1.1
Personal hygiene during menses	2	0.7
Male genital system	2	0.7
Male contraception	1	0.4
Preferred sources of information:		
School book	388	75.5
Educational media	109	21.2
Parents	74	14.4
TV	65	12.6
Friends	33	6.4
Magazines	22	4.3
Newspapers	19	3.7

(@) Not mutually exclusive

The very high prevalence of circumcision in the present study is expected given the low socio-economic conditions of their parents, with high illiteracy. Also, about half of them were from rural areas. In line with this, the study of Elnashar and Abdelhady (2007) revealed that 75.8% of the studied sample was circumcised. This unexpected low rate reflects the trend towards rejection of circumcision particularly in some classes. It was attributed to the higher educational levels of the participants, where

no illiterates were found among the non-circumcised females and the majority of them were at university level or higher; additionally, the majority was working and living in urban residential areas.

According to the present study findings, the majority of the circumcised girls reported having had related acute problems. This high rate of post-circumcision complications is in line with previous studies that reported serious complications, tragic deaths, and extensive reproductive health problems among young women following this procedure (Larsen and Okonofua, 2002; Yoong *et al.,* 2004; Braddy and Files, 2007).

Almost all adolescent girls in the present study had their menarche. This is quite plausible since the youngest age in the sample was 14 years old, which is beyond the usual age at menarche. Similar age at menarche was previously reported. For example, the average statistically weighted worldwide age at menarche was found to be 13.54 years (Garg *et al.,* 2001). Meanwhile, El-Gilany *et al.* (2005) in Egypt found that the age at menarche ranged from 10-16 years, with a mean and median of 12.9 and 13 years, respectively. This median is much higher compared to the present study, and this might be explained by differences in study settings.

According to adolescent girls' reporting, about one third had irregular cycles, with longer or shorter duration of the cycle, and longer bleeding days, and more than half of them had menstrual pain, mostly of moderate severity. Also, about one-third of them had more or less than average number of pads. This average, as reported by El-Gilany *et al.* (2005) was 2.5 times per day. Concerning the irregularities in time and bleeding, this might be due to that menstruation was at its start among the girls in the study sample, and this is usually associated with irregularities due to hormonal imbalance. However, Elnashar and Abdelhady (2007) had another explanation. They found that circumcised women had more irregularity of the cycle and more dysmenorrheal, which can result from chronic pelvic infection and is also caused by pelvic congestion. Menstrual flow may be retained due to tiny vaginal opening. Scarring can be the cause of genital infection and disturbances of menstruation.

Concerning physical findings, the majority of the adolescent girls in the present study had normal body mass index (BMI). Meanwhile, about 15% were overweight or obese, and an almost similar percentage was underweight. These findings indicate that obesity is not highly prevalent among them, but on the contrary, they have a problem with underweight. The finding might be explained by the low socio-economic level of their families. In fact, the socioeconomic status has been previously reported to be associated with underweight and obesity (Rennie and Jebb, 2005).

In congruence with the percentages of overweight found in the present study, Gordon-Larsen *et al.* (2004) showed similar levels of incident overweight in the transition from adolescence to young adulthood. The 5-year incidence of overweight in participants in their study ranged from 11.2% in the age category 13-15 years, to 14.6% in those who were 18-20.

However, in disagreement with the present study findings, a study of 9-16-year old rural youth demonstrated higher rates, where 15% of adolescents were chronically obese (Mustillo *et al.,* 2003). The high rate of obesity was attributed to the rapid growth rates that make adolescents vulnerable to excess weight gain, in addition to a variety of social factors that contribute to adolescent obesity including eating and physical activity patterns, especially TV viewing and other types of sedentary physical activity. Therefore, the importance of adolescence as a critical period for development of overweight may depend on the prevalence of many other obesigenic risk factors (Wardle *et al.,* 2006).

On the other hand, lower rates of overweight and obesity, compared to the present study were reported elsewhere. Thus, Vissers *et al.* (2008) demonstrated that in a sample of 16-18-year-old adolescents in Belgium, 9.9% were overweight and 3% were obese. Studies in other European countries also showed low prevalence of overweight and obesity among adolescents (International Association for the Study of Obesity, 2004; Janssen *et al.,* 2005).

As for the sources of information about female and male genital system anatomy and physiology, the great majority of the present study adolescent girls reported that the main source was school. In agreement with this finding, *de Irala et al. (2008)* highlighted that middle and high schools' textbooks are the most common educational resource, making them the backbone of the official curriculum and, to a greater extent, of the culture transmitted in the classroom. However, in Spanish schools, sexual education is a subject that can be covered by any teacher. Sometimes, specific courses about sexuality are given by a school counselor and aimed at parents and/or pupils. However, most education about sexuality is given in biology lessons.

However, in disagreement with the present study results, *Ancheta et al. (2005)* mentioned that most studied adolescent girls reported receiving reproductive health education from both parental (80%) and formal sources (92%). Parents discussed the menstrual cycle more frequently than other sex education topics, while formal sources focused most on teaching about sexually transmitted disease

(STDs). The authors also reported that early reproductive health education and education from both parental and formal sources is associated with reduced sexual risk among high-risk adolescent girls.

Concerning knowledge, attitude, and beliefs related to menstruation, the present study revealed that almost a half of the adolescent girls had negative attitudes and related misconceptions. Their knowledge about ovulation and sexual intercourse during menstruation was low. On the other hand, the majority knew the age at menarche, avoided prayer and Ramadan fast, and bathed during menses. Their correct knowledge about age at menarche and religious practices are expected since this is part of their experience and practices. On the other hand, the low knowledge about sexual intercourse during menses is attributed to the conservatism and restrictions on discussing these issues. In agreement with these study findings, *El-Gilany et al. (2005)* reported that the majority of the studied girls were taking showers during menstruation. Also, girls in a study in India had comp8arable findings, and they expressed their need for more information *(Garg et al., 2001)*.

Similar to knowledge about the genital system anatomy and physiology, the main source of information about menstruation among adolescent girls in the present study was the school book. The role of the media and parents was minimal in provision of information. This might be attributed to that according to cultural and traditional beliefs in Egypt menstruation is not considered an appropriate topic of discussion, which leads to the lack of accurate and available information among adolescents. Also, in school most young adolescents are probably too embarrassed to ask questions. Moreover, they might not even have a chance to ask questions.

These present study findings the majority of girls the number of pads changed are available(4-6)pads78%also reported the main source of information about menstruation are school book(85.6)are in disagreement with *El-Gilany et al. (2005)* who found that almost all the girls reported the mass media as their source of knowledge about menstrual hygiene, followed by mothers. In contrast, an earlier study in Alexandria demonstrated that mothers were the most common source of information on the physiology of menstruation and care before and after menarche, with school curricula and the media having a limited role *(El-Shazly et al., 1990)*.

The majority of the present study adolescent girls had positive attitude towards age for marriage, pregnancy spacing, and breastfeeding to be two years. In total, more than three-fourth of them had satisfactory knowledge about marriage, and more than half had related positive attitudes and beliefs. The positive attitude towards pregnancy spacing is quite important since closely spaced pregnancies among teenagers will, by definition, increase the risk of repeat teen pregnancies *(Gold et al., 2004)*. The optimal interpregnancy interval for preventing adverse birth outcomes appeared to be approximately 18-23 months *(Zhu et al., 1999; 2001; Zhu and Le, 2003)*

Regarding present study adolescent girls' knowledge, attitude, and beliefs related to sexually transmitted diseases (STDs), the findings point to high general knowledge, especially as related to AIDS, its manifestations, lack of treatment, and possible mother-fetal transmission. This high knowledge about AIDS might be explained by the fact that the mass media give great importance to this disease because of its seriousness, but disregard other more common STDs as gonorrhea and herpes. In congruence with this, it was found that a considerable number of adolescents in the U.S. have never heard of chlamydia or gonorrhea, whereas many adolescents have heard of AIDS *(Clark et al., 2002; Zamora et al., 2006)*.

Meanwhile, none of their socio-demographic characteristics was significantly related to their knowledge, attitude and beliefs related to reproduction. The only exception was association between satisfactory knowledge and having had circumcision. This might be explained by the experience the circumcised went through during the process of FGM, which might have increased their knowledge about reproductive system.

Furthermore, the present study revealed a statistically significant association between adolescent girls' knowledge about reproduction and their related attitudes and beliefs. It was noticed that more girls with satisfactory knowledge had positive attitudes. The finding indicates the influence of knowledge on attitudes and beliefs, and this should lead to fostering knowledge in order to correct negative attitudes and false beliefs.

The unmet information needs about reproductive health among the present study adolescent girls were mostly related to FGM, family planning, and pregnancy and labor. Similar unmet needs were reported in the study carried out by *Bansah et al. (2007)*. They also indicated that prenatal classes needed to be flexible so that if any new issue arose, it could be discussed. Moreover, *Gagnon (2001)* showed that participants wanted to receive specific information that was not necessarily what health-care providers taught, and this was probably due to their cultural values.

Conclusion

The study findings lead to the conclusion that the great majority adolescent nursing students, as other female adolescents in Egypt are circumcised, and had related acute problems. Overweight and obesity are not major problems among them. Only less than two-thirds of them have satisfactory knowledge about reproductive health, although the majority have positive attitude. Knowledge is significantly related to having had circumcision, and also to attitudes and beliefs. Their main sources of information are classroom while parents, health care providers, and media are less reported. The preferred sources of information are school book, educational media, and parents. If this are the findings among nursing students who ought to know better about health-related issues, worse is expected among other adolescents who had no chance to study them.

Recommendations

Based on the study findings, the following recommendations are suggested.

The unmet information needs identified in the study should be the base for development of educational programs for adolescents regarding reproductive health.

Since school was mentioned as the most preferred source of information, this raises the issue of including reproductive health topics in their curricula, not only nursing schools, but also general schools.

The false beliefs identified in relation to menstruation, female genital mutilation, marriage and pregnancy, and home responsibilities must be addressed in health education programs designed for adolescents.

The principles of adult learning with open discussions and active participation of attendants must be followed in any training programs for reproductive health for adolescents.

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