

## ORIGINAL RESEARCH

# Knowledge, attitude and practice related to reproductive health among female adolescents

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## ABSTRACT

**Objective:** Reproductive health (RH) is a crucial aspect of general health; it is a reflection of health during adolescence and adulthood. The period of adolescence in females is a period of physical and psychological preparation for safe motherhood. As direct reproducers, adolescent girls' health influences not only their own health but also the health of the future generation. This study aimed to assess knowledge, hygiene practices during menses, and attitudes of female adolescents in Riyadh female secondary schools regarding RH aspects.

**Methods:** A quantitative descriptive cross-sectional design was used for this study conducted on 350 female students selected from governmental secondary schools in Riyadh using multistage random sample type. Two tools were used for data collection in the current study: a self-administered questionnaire and an Attitudinal Assessment scale.

**Results:** The findings showed that more than two-thirds (66.3%) of the participants had inaccurate knowledge, while about one-third (33.7%) of them had correct knowledge regarding RH. With respect to overall hygiene practices during menstruation, about 95.4% had correct menstruation hygiene practice, while only 4.6% had incorrect practices. The majority (88.3%) of students had positive attitudes regarding RH, while only 11.7% had negative attitudes. Mothers are a vital source of information regarding RH.

**Conclusions:** The present study concluded that female adolescents had unsatisfactory knowledge, inadequate hygiene practices, and positive attitudes toward RH. It is recommended to improve adolescents' knowledge regarding RH issues and involve their parents and teachers to provide appropriate education related to RH issues.

**Key Words:** Knowledge, Adolescent, Reproductive health, Practice, Attitude

## 1. INTRODUCTION

The World Health Organization (WHO, 2017) identifies adolescence as the period of human growth and development that occurs after childhood and before adulthood, from 10 to 19 years of age.<sup>[1]</sup> This period of adolescence is further categorized into three stages, namely early adolescence (10 to 13 years), mid-adolescence (14 to 15 years), and late adolescence (14 to 15 years).<sup>[2]</sup> The period of adolescence for

a girl is a period of physical and psychological preparation for safe motherhood.<sup>[3]</sup> Reproductive health (RH) covers all aspects of adolescent health. The WHO defines RH as "a state of complete physical, mental and social well-being, and not just the absence of disease or debility, in all circumstance relating to the reproductive system and its functions and processes."<sup>[4]</sup> It is an important aspect of female adolescents' global health milestones. Menarche is one of these mile-

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stones. A female individual's RH status is greatly influenced by their perception to menarche during adolescence, beliefs and attitude regarding menstruation, and more importantly, the behavior during this period.<sup>[5]</sup> Another aspect of the RH is the age of marriage. Early marriage is generally associated with early childbearing and high fertility, both of which are health risks for women and their children.<sup>[6]</sup> In terms of family planning, adolescent girls globally are probably the most vulnerable group as they are the victims of early marriage and early and frequent childbearing, all of which lead to high morbidity and mortality.<sup>[7,8]</sup> Controlling both the number and timing of births through utilization of contraception is associated with improved maternal and neonatal health outcomes. Reports from around the world reveal that many women suffer from illnesses and disabilities resulting from easily preventable pregnancies and childbirth-related complications. Family planning (FP) has been associated with positive health effects on children, mothers, and the entire family.<sup>[9-12]</sup>

In the new era of globalization, adolescents are exposed to unlimited information from numerous resources. Television, movies, music, magazines, and internet play a vital role in providing information on every topic, particularly RH. However, in many instances, the information provided is not accurate or culturally competent. While parents and schools should play a significant role in providing sex education, studies show that parents rarely talk in a timely and comprehensive manner to their children, and schools are limited in what they can teach.<sup>[13]</sup> The hygiene-related practices in the adolescent period related to menstruation can have an effect on their health. The event of menarche may be associated with taboos and myths existing in our traditional society which has a negative implication for women's health, particularly their menstrual hygiene.<sup>[14]</sup> Studies have shown that lack of knowledge about menstruation and lack of hygiene are likely to lead to STDs in adolescents.<sup>[15,16]</sup> Therefore, accurate and adequate RH knowledge at this age is crucial for proper practices and behavior regarding RH for the future.<sup>[17]</sup> A study was conducted by Al-Quaiz et al. (2013) to assess sexual health knowledge, attitudes, and resources among adolescent girls in public and private schools in Riyadh, SA; it was identified that 42% of students discuss RH topics with their friends, 15.8% with their parents, and 17% with their household servants.<sup>[18]</sup> Adolescents often lack basic RH knowledge and behavior and are less comfortable accessing RH services than adults due to embarrassment or discomfort in discussing sensitive topics with their healthcare provider and less favorable attitudes toward the use of healthcare services and providers.<sup>[19]</sup>

## 1.1 Statement of the problem

In most of the MENA countries, sexual and reproductive health is socially and culturally sensitive issue. As a result, RH information and services do not reach the majority of adolescents, leading to misconceptions, confusion, and lack of awareness among this vulnerable group. Few countries such as Tunisia, Morocco, Yemen, Turkey, and Iran have begun to focus on youth sexual and reproductive issues using international policy frameworks to map out their approach.<sup>[13]</sup>

Research on youth sexuality in MENA countries is still in the early phase of establishing a baseline for information on knowledge, attitudes, and behaviors among diverse populations. There are some unpublished reports regarding the level of sexual education imparted through the schools in the Kingdom of Saudi Arabia (KSA), but no scientific, epidemiological survey on sexual health in KSA has been conducted among adolescent girls.<sup>[13]</sup>

## 1.2 Significance of the study

Adolescents represent great potential human resources for the overall development of a nation. Presently, almost 1 in 5 persons in the world is an adolescent, which is 1.2 billion people between the ages of 10 and 19 years, accounting for 17 percent of the global population.<sup>[19-21]</sup> Currently, there is a low level of access to high-quality RH information and services, especially for adolescents.<sup>[22]</sup> There is limited discussion of issues concerning RH in general, and specifically, in the MENA countries.<sup>[23]</sup> In the past few years, the issues of RH have been increasingly perceived as a social problem; they have been emerging as a topic of increasing concern in both developed and developing countries.<sup>[24]</sup> Therefore, focusing on adolescents' RH is both a challenge and an opportunity for healthcare providers. While adolescence generally is a healthy period of life, many adolescents are less informed, less experienced, and less comfortable accessing health services for RH than do adults.<sup>[19]</sup> In this light, it is essential to investigate this matter in some areas of KSA to establish a baseline for information on knowledge, especially among secondary school adolescents. The Health Belief Model (HBM) was used as the conceptual framework for this study. The HBM is one of the most widely used conceptual frameworks for understanding health behaviors and is believed to lay the foundation of a study, which enables the researcher to identify what is known or unknown about the topic of interest in order to conduct research that adds to the body of knowledge.<sup>[25]</sup> This study aimed to assess the knowledge, attitude, and practices of female adolescents regarding RH in Riyadh.

## 2. METHODS

### 2.1 Research design

A quantitative descriptive cross-sectional design was used in this study.

### 2.2 Setting

The study was conducted at 6 governmental secondary schools representing the eight educational zones of the central Riyadh city.

### 2.3 Population and sampling type

Multistage sampling technique was used as follows:

**Stage I:** Riyadh city is divided into 5 sectors: north, south, east, west, and central of city. The governmental secondary schools for females in Middle of Riyadh city were selected randomly.

**Stage II:** Middle of Riyadh includes 8 areas, and there are a total of 12 governmental female secondary schools distributed in those 8 areas; six secondary schools were chosen by simple random sampling technique.

**Stage III:** From each grade, 58-59 students were selected systematically, and 350 female students who met the criteria were included in this study.

### 2.4 Sample size

Statistically, calculated sample size equals 350 female students from the total of 2,452 female students based on the last census for the Ministry of Education at the governmental secondary schools in the middle of Riyadh city (Saudi Arabia Ministry of Education Census, 2014). 350 female students were divided on 6, the results were 58-59 students were collected from each school.

### 2.5 Sample criteria

The inclusion sampling criteria were: Secondary school girls of all grades (1st, 2nd, 3rd), Saudi & non-Saudi nationalities, enrolled in a governmental school in Riyadh city during the time of the study, willingness to participate in the study, while the exclusion criterion was refusal to participate in this study.

### 2.6 Tools of data collection

Two tools were used for data collection in the current study.

**Tool I:** The self-administered questionnaire: The questionnaire was designed by the researchers, and it consists of three parts as follows:

*Part I:* Included participants' sociodemographic data such as, educational level, mother's age, mother's level of education and employment status, menstrual and gynecological history.

*Part II:* Knowledge regarding RH aspects, which are described as follows:

- (1) Domain 1 (Knowledge about puberty and marriage): Female adolescents' knowledge regarding the female reproductive system, puberty in girls, menstrual cycle, and marriage.
- (2) Domain 2 (Knowledge about pregnancy and childbirth): This consists of questions about the time of ovulation each month, timing of conception, appropriate age for the first pregnancy, signs of pregnancy, the ideal gap between delivery and the next one, abortion, causes of abortion, and precautions for the prevention of abortion.
- (3) Domain 3 (Knowledge about family planning methods for females): This includes family planning methods and the proper way to obtain contraceptives.
- (4) Domain 4 (Knowledge about STDs): Knowledge regarding what STDs are, possibility of recovery, and the effect of infection of STD on RH.
- (5) Domain 5 (Source of knowledge): This domain comprises fourteen items that address the source of information regarding RH.

*Part III:* This involved obtaining an insight into the hygiene practices during menstruation. It comprised of 10 items related to menstruation, which included the number of times of changing sanitary pads and the method of disposal, medium used for cleaning, washing the genitalia while showering, number of baths taken during menstruation, activities and exercise during menstruation, foods and drinks that should and should not be taken during menstruation, underwear type used during menstruation.

**Tool II:** A three point Likert-type scale was developed to assess students' responses to attitude items regarding RH. This scale consist of 8 items that include the adolescents' attitude towards puberty, menstrual cycle, pregnancy and childbirth, family planning methods, STDs, and the use and access of RH services for adolescents.

### 2.7 Pilot study

To assess the clarity, feasibility, and applicability of the tools used in this study for data collection, a pilot study was conducted with 10% of the predetermined sample size according to the study criteria. The results of the pilot study helped in the necessary modifications of the tools according to the content validity and results of the pilot study. The sample used in the pilot study was excluded from participation in the main study.

### 2.8 Reliability and validity of the instrument

The content validity of the questionnaire was reviewed by five experts from the same field in order to establish the relevance of the questionnaire items to the study objectives. The experts conducted their review separately. To sustain the self-determination of the reviews, all reviewers were asked to carry out the reviews alone; the reviewers' identities were not revealed to each other aside from the researcher. The results indicate that expert reviews have a significant impact on identifying the issues with the questions. Therefore, some changes were applied based on experts' recommendations. The internal consistency was also measured. Student's answers related to knowledge were scored and calculated. According to the answers, students' responses were evaluated using the model key answer sheet previously prepared by the researchers based on literature review. To score students' knowledge regarding RH, correct and complete answers were scored as 2, while an incorrect wrong answer was scored zero. An attitudinal assessment scale—a three-point Likert-type scale (agree, uncertain, disagree)—was developed to examine students' responses to the items assessing attitude towards RH. It consists of 8 statements to which the students were asked to respond by selecting one of the choices. To score students' attitude towards RH, a score of 3 was given for 'agree', 2 for 'uncertain' and 1 for 'disagree'. Each question was scored, and the maximum possible attitude score was 24 points. The total score ranging from 21-24 indicates a positive attitude towards RH, and a total score less than 12 (50%) indicates negative attitude towards RH.

### 2.9 Ethical consideration

Approval from the KSU Nursing College and Ministry of Health were obtained prior to data collection. The participants were provided the data collection tool, which contained the study explanation, its purpose, and the instructions for the participants. The responses were anonymous, and their consent to share the results in the study was obtained. Participation was voluntary, and the participants had the right to withdraw from the study at any time without affecting their rights. All answers were kept confidential and for the purpose of the current study. There was no known harm or conflict to the participants in relation to participation in this study.

### 2.10 Data analysis

After data collection, the data were checked for their quality and completeness. Each questionnaire was coded and scored on the basis of the appropriate scoring method. Data were loaded and analyzed using Statistical Package for Social Science (SPSS) Version 22 (SPSS Inc, IBM). Descriptive statistics were used to describe the sample variables frequen-

cies, means, and standard deviations. *p*-value was significant at  $< .05$ . Chi-squared test was used to examine the distribution of the data, and independent sample *t*-test was used to compare the variables.

## 3. RESULTS

More than half (52.3%) of the adolescents' age ranged from 17 to 19 years, while less than half (43.1%) were aged 15 to 17 years old. Regarding the student's grades, 31.4%, 42%, and 26.3% were in the 1st, 2nd, and 3rd grades, respectively. More than half (56.3%) of their mothers had completed compulsory school education, while 28% completed university education. Regarding the age, about 61.4% of mothers were aged 35 to 45 years old. The majority of the mothers (79%) were unemployed.

With respect to knowledge of female adolescents regarding puberty and marriage as shown in Table 1, it is evident that more than half (54.3%) of the participants had correct knowledge about the female reproductive organs, while 45.2% did not have correct knowledge, with no significant statistical differences ( $p = .086$ ). More than half (59.4%) had correct knowledge about puberty signs in girls, while 40.3% have incorrect knowledge. The differences are highly significant with  $p < .000$ . Concerning knowledge about menstrual cycle, it was noticed that female adolescents had a high rate of correct answers (92%) about the cause of menstruation with significant differences ( $p < .000$ ). Regarding knowledge about marriage, the majority (88%) had correct knowledge about the appropriate age for marriage with significant difference ( $p < .000$ ).

Table 2 shows the distribution of female adolescents in terms of knowledge about pregnancy and childbirth.

Table 3 shows that most of the students (87.1%) had correct knowledge about contraceptive pills, and 72% were knowledgeable about breastfeeding as a method of family planning ( $p < .000$ ). Knowledge about female sterilization and male sterilization was poor (85% and 79%, respectively) with a significant difference ( $p < .000$ ).

Table 4 shows the distribution of female adolescents in terms of their knowledge about STDs. For 15% and 16.4% of the female adolescents, the sources of knowledge about female reproductive system and STDs were books, newspapers, magazines, school textbooks, Fiqh books, while the source of knowledge about puberty.

Table 5 shows the distribution of female adolescents according to their RH practices during menstruation. Most of female students (99.4%, 93.7%, 93.4%, 92.9%, 87.7%, 87.1%, and 85.1%) had correct practices with respect to the number

of times of changing sanitary pads each day, the way of disposing sanitary pads, washing the genitalia while showering, foods and drinks that should not be taken during menstruation, number of baths during the menstrual cycle, underwear type used, and towels used during menstruation, respectively.

However, more than two-third (68.6%) had incorrect knowledge about the tools used for cleaning during menstrual cycle, and also the majority (82.6%) did not practice any activities or exercise during menstrual cycle ( $p < .000$ ).

**Table 1.** Distribution of female adolescents related to their knowledge about puberty and marriage (n = 350)

Items	Correct Answers		Incorrect Answers		p value
	No.	%	No.	%	
<b>Knowledge of female adolescents regarding the female reproductive system</b>					
Female reproductive organs	190	54.3	158	45.2	.086
<b>Knowledge about puberty in girls</b>					
Puberty signs in girls	208	59.4	141	40.3	.000
<b>Knowledge about menstrual cycle</b>					
Cause of menstruation	321	91.7	29	8.3	.000
Source of menstrual blood	244	69.7	106	30.3	.000
Menstrual blood discharge site	201	57.4	149	42.6	.005
<b>Knowledge about Marriage</b>					
Appropriate age for marriage	307	87.7	43	12.3	.000

Note. N.B significant at .05.

**Table 2.** Distribution of Female Adolescents in terms of knowledge about Pregnancy and Childbirth (n = 350)

Items	Correct Answers		Incorrect Answers		p value
	No.	%	No.	%	
Time of ovulation each month	41	11.7	309	88.3	.000
Timing of conception	5	1.4	345	98.6	.000
Appropriate age for the first pregnancy	317	90.5	33	9.5	.000
Signs of pregnancy	219	62.6	131	37.4	.000
Ideal gap between delivery and the next one	206	58.8	144	41.2	.001
Meaning of abortion	24	6.9	326	93.1	.000
Causes of abortion	273	78	77	22	.000
Precautions for the prevention of abortion	320	91.4	30	8.6	.000

**Table 3.** Distribution of Female Adolescents in terms of knowledge about Family planning methods (n = 350)

Items	Correct Answers		Incorrect Answers		p value
	No.	%	No.	%	
<b>Known family planning methods</b>					
Female sterilization (severing the fallopian tubes)	54	15.4	296	84.6	.000
Contraceptive pills	305	87.1	45	12.9	.000
Intrauterine device (IUD)	221	63.1	129	36.9	.000
Breastfeeding	252	72	98	28	.000
Hormonal injection	81	23.1	269	76.9	.000
Condom	145	41.4	205	58.6	.001
Male sterilization	74	21.1	276	78.9	.000
Localized methods	56	16	294	84	.000
Temperature measurement/evaluation method	96	27.4	254	72.6	.000
Isolation (withdrawal)	81	23.1	269	76.9	.000
<b>Obtaining contraceptives</b>					
The proper way to obtain contraceptives	279	79.7	71	20.3	.000

**Table 4.** Distribution of Female Adolescents related to knowledge About sexually transmitted diseases (n = 350)

Items	Correct Answers		Incorrect Answers		p value
	No.	%	No.	%	
<b>1. Sexually transmitted diseases are</b>					
Gonorrhoea	132	37.7	218	62.3	.000
Syphilis	108	30.9	242	69.1	.000
Chlamydia	35	10.0	315	90	.000
Human immunodeficiency virus, HIV/AIDS	293	83.7	57	16.3	.000
Genital herpes/ulcer	130	37.1	220	62.9	.000
<b>2. The possibility of recovery from all sexually transmitted diseases</b>					
Recovery from sexually transmitted diseases	152	43.4	198	56.6	.014
<b>3. Curable sexually transmitted diseases</b>					
Curable sexually transmitted diseases	16	4.6	334	95.4	.000
<b>4. Effect of infection of sexually transmitted diseases on RH</b>					
The effect of infection of STD on RH	162	46.3	188	53.7	.165

**Table 5.** Distribution of Female Adolescents in terms of practices regarding RH during menstruation (n = 350)

Items	Correct Answers		Incorrect Answers		p value
	No.	%	No.	%	
Number of times of changing sanitary pads per day	348	99.4	2	0.6	.000
Towels used during menstruation	298	85.1	52	14.9	.000
Number of baths during the menstruation	307	87.7	43	12.3	.000
Genitalia washing	327	93.4	23	6.6	.000
Tools used for cleaning during menstruation	110	31.4	240	68.6	.000
The method of disposing sanitary pads	328	93.7	22	6.3	.000
Activities and exercises during menstruation	61	17.4	289	82.6	.000
Foods and drinks that should not be taken during menstruation	325	92.9	25	7.1	.000
Foods and drinks that should be taken during menstruation	154	44	196	56	.032
Underwear type used during menstrual cycle	305	87.1	45	12.9	.000

Table 6 illustrates that the highest positive attitudes (96.6% and 96.3%) were toward education about puberty associated changes and attention to personal hygiene during menstruation, respectively.

**Table 6.** Distribution of Female Adolescents in terms of their attitude toward RH (n = 350)

Items	Positive Attitude		Negative Attitude		p value
	No.	%	No.	%	
Education about puberty and associated changes is essential for adolescent girls	317	90.6	33	9.4	.000
Attention to personal hygiene during menstruation is essential to avoid infections and STD	337	96.3	13	3.7	.000
Pregnancy at young age affects the health of the fetus and the mother	167	47.7	183	52.3	.000
Closed rapprochement of pregnancy and childbirth affects the mother and fetus	158	45.1	192	54.9	.000
The use of family planning methods is useful	230	65.7	120	34.3	.000
STDs affect the fetus	258	73.7	92	26.3	.000
Adolescent girls are in need of RH services	194	55.4	156	44.6	.000
Adolescents need to know about the health services for RH	250	71.4	100	28.6	.000

Table 7 shows that a positive statistically significant correlation was found between educational level of the students ( $p = .01$ ) and their mother ( $p = .001$ ) and their knowledge about the female reproductive system. A significant positive correlation was found between students' information about puberty in girls and their educational level ( $p = .008$ ). Inversed correlation between information about the menstrual cycle and mother's employment status was found ( $p = .034$ ),

as well as information about pregnancy and childbirth ( $p = .008$ ).

Table 8 illustrates the inversed correlation between adolescents' ages with their practice regarding underwear type used during menstrual cycle ( $p = .043$ ); while a positive correlation was found with their mothers' age ( $p = .038$ ) and mothers' educational level ( $p = .000$ ).

**Table 7.** Correlations between Demographic profile of the mothers and Female adolescents and their Knowledge of RH (n = 350)

No.	Knowledge	Demographic data						
				Adolescents' Age	Adolescents' Educational level	Mother's age	Mother's Educational level	Mother's employment status
1.	Knowledge of adolescents regarding the female reproductive system	Correct	N	190	190	190	190	190
		Incorrect	N	156	156	156	156	156
		<i>t</i>		-809	2.580**	1.568	3.287**	-1.204
		Sig.		.419	.010	.118	.001	.229
2.	Knowledge about puberty in girls	Correct	N	207	207	207	207	207
		Incorrect	N	141	141	141	141	141
		<i>t</i>		1.310	2.655**	-.639	-.587	1.241
		Sig.		.191	.008	.523	.557	.216
3.	Knowledge about the menstrual cycle	Correct	N	264	264	264	264	264
		Incorrect	N	84	84	84	84	84
		<i>t</i>		.473	1.390	-1.342	1.754	-2.125*
		Sig.		.637	.165	.180	.080	.034
4.	Knowledge about marriage	Correct	N	306	306	306	306	306
		Incorrect	N	42	42	42	42	42
		<i>t</i>		.453	.586	-.260	1.149	1.028
		Sig.		.651	.558	.795	.251	.305
5.	Knowledge about pregnancy and childbirth	Correct	N	184	184	184	184	184
		Incorrect	N	164	164	164	164	164
		<i>t</i>		.916	1.423	.267	-.667	-2.648**
		Sig.		.360	.156	.789	.506	.008
6.	Knowledge about family planning methods for females	Correct	N	108	108	108	108	108
		Incorrect	N	240	240	240	240	240
		<i>t</i>		-.361	-.321	-.999	.091	.205
		Sig.		.719	.749	.318	.928	.838
7.	Knowledge about STDs	Correct	N	132	132	132	132	132
		Incorrect	N	216	216	216	216	216
		<i>t</i>		-.655	.466	.573	-.646	1.504
		Sig.		.513	.641	.567	.519	.133
8.	Knowledge about request for treatment	Correct	N	149	149	149	149	149
		Incorrect	N	199	199	199	199	199
		<i>t</i>		-.145	.590	-.879	-.325	-2.140*
		Sig.		.885	.556	.380	.745	.033

\* Correlation is significant at .05 levels (2-tailed). \*\* Correlation is significant at .01 levels (2-tailed).

Table 9 revealed that attitudes toward menstrual cycle had a statistically positive significant relationship with students' age ( $p = .015$ ) and mother's age ( $p = .015$ ); while mother's education level was inversely correlated with point of view regarding family planning methods ( $p = .004$ ) and point of

view regarding STDs ( $p = .004$ ). A statistically positive significant relationship was found between point of view regarding RH services and adolescences' age ( $p = .002$ ), educational level ( $p = .002$ ), and mothers' employment status ( $p = .049$ ).

**Table 8.** Correlations between Demographic profiles of Female Adolescents and their mothers toward RH Practice (n = 350)

No.	Practice	Demographic data						
				Adolescents' Age	Adolescents' Educational level	Mother's age	Mother's Educational level	Mother's employment status
1.	Number of times of changing sanitary pads each day	Correct	N	347	347	347	347	347
		Incorrect	N	1	1	1	1	1
		<i>t</i>		-.680	-1.393	.429	-1.092	-.493
		Sig.		.497	.164	.668	.276	.623
2.	Towels used during menstruation	Correct	N	297	297	297	297	297
		Incorrect	N	51	51	51	51	51
		<i>t</i>		-1.300	-.555	-.797	.220	.379
		Sig.		.194	.579	.426	.826	.403
3.	Number of baths during the menstruation	Correct	N	306	306	306	306	306
		Incorrect	N	42	42	42	42	42
		<i>t</i>		-1.552	-1.804	.483	1.385	-.583
		Sig.		.122	.072	.630	.167	.560
4.	Genitalia washing	Correct	N	326	326	326	326	326
		Incorrect	N	22	22	22	22	22
		<i>t</i>		-1.379	-.348	.086	-.570	-.229
		Sig.		.169	.728	.932	.569	.819
5.	Tools used for cleaning during menstruation	Correct	N	109	109	109	109	109
		Incorrect	N	239	239	239	239	239
		<i>t</i>		-1.086	-.464	.172	.711	-.870
		Sig.		.278	.643	.863	.478	.385
6.	The way of disposing sanitary pads	Correct	N	327	327	327	327	327
		Incorrect	N	21	21	21	21	21
		<i>t</i>		.310	.253	.669	-.337	-.123
		Sig.		.757	.801	.504	.736	.902
7.	Activities and exercise during menstruation	Correct	N	62	62	62	62	62
		Incorrect	N	286	286	286	286	286
		<i>t</i>		.542	.440	-.556	-1.121	.504
		Sig.		.588	.660	.578	.263	.615
8.	Foods and drinks should not be taken during menstruation	Correct	N	25	25	25	25	25
		Incorrect	N	323	323	323	323	323
		<i>t</i>		-1.166	-.720	.903	1.515	-1.002
		Sig.		.244	.472	.367	.131	.317
9.	Foods and drinks that should be taken during menstruation	Correct	N	179	179	179	179	179
		Incorrect	N	169	169	169	169	169
		<i>t</i>		-.195	-.880	-.957	-.791	.264
		Sig.		.846	.380	.339	.429	.792
10.	Underwear type used during menstruation	Correct	N	304	304	304	304	304
		Incorrect	N	44	44	44	44	44
		<i>t</i>		-2.026*	-.722	2.080*	.377**	-.335
		Sig.		.043	.471	.038	.000	.738

\* Correlation is significant at .05 levels (2-tailed). \*\* Correlation is significant at .01 levels (2-tailed).



**Table 9.** Correlations between Demographic profile of Female adolescents and their mother regarding RH Attitude (n = 350)

No.	Attitude	Demographic data						
				Adolescents' Age	Adolescents' Educational level	Mother's age	Mother's educational level	Mother's employment status
1.	Attitude towards puberty	Positive	N	316	316	316	316	316
		Negative	N	32	32	32	32	32
		<i>t</i>		.159	-.182	.867	-1.180	1.622
		Sig.		.874	.855	.386	.239	.106
2.	Attitude toward menstrual cycle.	Positive	N	335	335	335	335	335
		Negative	N	13	13	13	13	13
		<i>t</i>		2.434*	.852	2.444*	1.236	1.654
		Sig.		.015	.395	.015	.217	.099
3.	Attitude towards pregnancy and childbirth	Positive	N	247	247	247	247	247
		Negative	N	101	101	101	101	101
		<i>t</i>		-1.124	-.391	.664	-1.044	1.647
		Sig.		.262	.696	.507	.297	.100
4.	Attitude towards family planning methods	Positive	N	229	229	229	229	229
		Negative	N	119	119	119	119	119
		<i>t</i>		1.673	.819	-1.389	-2.925**	.017
		Sig.		.095	.413	.166	.004	.986
5.	Attitude towards STDs	Positive	N	257	257	257	257	257
		Negative	N	91	91	91	91	91
		<i>t</i>		1.153	1.941	.530	-2.911**	1.104
		Sig.		.250	.053	.596	.004	.270
6.	Attitude towards reproductive health services	Positive	N	261	261	261	261	261
		Negative	N	87	87	87	87	87
		<i>t</i>		3.048**	3.180**	.326	-1.681	1.978*
		Sig.		.002	.002	.745	.094	.049

\* Correlation is significant at .05 levels (2-tailed). \*\* Correlation is significant at .01 levels (2-tailed).

#### 4. DISCUSSION

The age of female adolescents in the current study ranged from 15 to 19 years. The age of 52.3% of the participants ranged from 17 to 19 years, while 34.1% were aged 15 to 17 years, which is similar to the findings reported by Mittal and Goel (2010) and Akhtar et al. (2012), who assessed the knowledge and perception about the RH issues among unmarried adolescent girls aged 15-19 years. More than half of their respondents were aged 18-19 years (55%).<sup>[26,27]</sup> In the present study, the majority (88.3%) of the students females being menstruated between age of 11 to less than 15 years old, and about two-thirds had regular cycles, which coincide with the studies conducted in India by Savanthe et al. (2016) and Kamath et al. (2013).<sup>[14,28]</sup> In the same context, abdominal pain followed by back pain was found to be the most frequent complaint during menstruation among the students in the present study, which is similar to the results reported by Savanthe et al.<sup>[27]</sup> Regarding knowledge about puberty and menstruation, the results of the current study revealed that

more than half of the female adolescents had correct knowledge about the signs of sexual maturation in females such as breast development, pubic hair development, menstruation, increase in height and weight, which may be due to the information they achieved in courses on religion and biology. This is in line with a study conducted in Baghdad City, which reported that half of the adolescent girls had good awareness about pubertal changes (primary sex characteristics, attaining sexual maturity, onset of menstruation and pubic hair).<sup>[29]</sup> The present study showed that 91.7% of female adolescents gave correct answers about the cause of menstruation as a normal sign of growth and puberty, while only 8.3% girls did not know the cause of menstruation. This finding is similar to the study results of Savanthe et al., who reported that most of the students (86%) understand that menstruation is normal phenomenon<sup>[28]</sup> and another finding by Das et al. (2016) in a study conducted among high school girls in Vadodara city, wherein 70% identified that menstruation is a normal process. However, the findings of another study are consistent with

the current results as it reported that 70% of the girls thought that menstruation is an unnatural process.<sup>[30]</sup>

Shatha (2013) reported that adolescents' answers about the site of menstrual blood were correct (76.0%).<sup>[29]</sup> This coincides with the findings of the present study; 69.7% of the adolescents had correct knowledge that the source of menstrual blood source is the uterus, while it is inconsistent with the finding of Savanthe et al.'s study (2016).<sup>[28]</sup> Moreover, Bhattacharjee et al. (2013) reported that approximately one-third of their sample correctly identified the source of menstrual blood (30%).<sup>[31]</sup>

This study reported that information regarding different aspects of menstruation was obtained from various resources such as mothers, relatives, media (TV or Internet), which is similar to the results found by Dasgupta et al. (2008) in a study conducted in Kolkata.<sup>[32]</sup> Further, another study carried out in Tirupati by Reddy et al. (2005) found that mothers (61.2%) were the primary source of information about menstruation. Therefore, it can be said that mothers are mainly the primary source of information for this important topic.<sup>[33]</sup> This could be due to good communication between the mothers and daughters as many mothers are being educated nowadays. Female students had inadequate knowledge regarding the time of ovulation per month and the timing of conception. This may be due lack of discussion regarding some RH topics in the school or family. Similar results were found by Parasuraman et al. (2005),<sup>[34]</sup> Patanwar et al. (2013), and Abiodun et al. (2016).<sup>[35,36]</sup> In addition, the majority of the girls in the current study had adequate knowledge about the appropriate age for the first pregnancy to be above 20-30 years; this is in agreement with a study by Patanwar et al. (2013)<sup>[35]</sup> and Lamadah et al. (2015).<sup>[37]</sup> Among the respondents of the present study, more than half of adolescent girls stated that the ideal gap between delivery and the next one is more than 2 years. This is consistent with the study done in Ludhiana, which showed that 62% of the adolescent girls preferred a gap of more than 2 years between the pregnancies.<sup>[38,39]</sup> The Child Marriage Restraint Act of 1978 raised the legal age for marriage from 15 to 18 years for girls. Awareness regarding the appropriate age for marriage was very high in the current study. These results are similar to a study done by Fatemeh et al. (2015).<sup>[40]</sup>

Regarding the knowledge about family planning methods, oral contraceptive pills (OCP) was the most known contraceptive method. This is in agreement with the findings of the study done in Ethiopia (2014) and Nigeria (2016). It was not surprising that 72% of the female adolescents gave correct answers regarding breastfeeding as a family planning method followed by intrauterine devices (IUD), which may

be due to the information received from their mothers and relatives as well as school lessons. On the other hand, long-term contraceptive methods were relatively unknown among the students in the current study similar to other adolescents in the previous studies.<sup>[36-41]</sup>

Knowledge about female sterilization and male sterilization was poor, which is somewhat similar to a study done by Patanwar et al. (2013) who reported that only 14.1% of adolescents had knowledge about female sterilization, and 7% had knowledge about male sterilization.<sup>[35]</sup> This result contradicts that of Gollakota et al.'s study (2015), who reported higher knowledge among female adolescents regarding female and male sterilization in their study.<sup>[42]</sup>

HIV/AIDS was the most known STD among the adolescents of the current study, and this is expected due to a current worldwide pandemic of the disease. This is consistent with the studies of Abiodun et al. (2016), Patanwar et al. (2013), and Gollakota et al. (2015).<sup>[35-42]</sup> The adolescents in the current study were aware of STDs like Syphilis, Gonorrhoea, and ulcer in the genital area. Although chlamydial infections are the major causes of pelvic inflammatory diseases, tubal occlusions, and infertility, only 10% of the students in the current study were aware of it. This is closely consistent with Gollakota et al.'s (2015) results.<sup>[42]</sup> The main sources of information regarding STDs for the students in the current study were school textbooks, Internet, followed by the mother and TV. They learned about the topics in the courses discussed in the school classes as it was the major source of knowledge regarding STDs. On the other hand, mothers, relatives, and the Internet were reported as the least common source of STD information. This is may be due to the society in the Middle East where parents hesitate to discuss some important RH issues with their daughter and even sons. These findings were similar to the findings of a study done in Nepal and Bangladesh.<sup>[43]</sup> Regarding the cure for STDs, the majority of the students in the current study had incorrect knowledge about curable diseases; this is consistent with the studies of Patanwar et al. (2013),<sup>[35]</sup> and Masood et al. (2015), which reported wrong perception among their samples.<sup>[44]</sup> Most of the female adolescents in the present study had overall incorrect knowledge about RH. The findings of the current study are similar to those of Lamadah et al.'s study (2015), which reported low overall knowledge in their sample.<sup>[37]</sup> However, the results of the current study contradict with that of Farih et al. (2014) who reported that half of their study sample had a good level of knowledge.<sup>[23]</sup>

The current study revealed that the majority of girls who followed correct hygienic practices during menstruation with

respect to the type of towels used were those who used sanitary pads (85.1%). This is consistent with the findings of Bhattacharjee et al. in West Bengal, India, who reported about 71.3% of their study subjects used sanitary pads as absorbents.<sup>[31]</sup> The common use of pads may be a result of high availability and increased awareness from television regarding availability and use of sanitary napkins. Moreover, a high percentage (99.4%) of girls correctly answered the question on frequency of changing sanitary pads per day. In contrast, a study by Mudey et al. reported that cleanliness of external genitalia was unsatisfactory.<sup>[15]</sup>

The present study showed that 93.7% girls followed correct practices on methods of disposal of used sanitary pads including using the correct place for waste disposal. The same results were reported by other studies.<sup>[28]</sup> Incorrect hygiene practices were common; 68.6% of female adolescents used soap or shampoo for cleaning the external genitalia in the current study. This is consistent with a study by Sreedhar et al. who reported soap and water were the most common materials used by girls (82.2%) for cleaning the external genitalia.<sup>[45]</sup> There are different beliefs and taboos related to restricted movement and feeding patterns during menstruation in different cultures, which guide the menstrual practices of female adolescent. Bathing during menstruation is traditionally forbidden in rural cultures in Egypt and Pakistan.<sup>[46,47]</sup> Aktar et al. and Mohite et al.<sup>[16,17]</sup> reported that almost all girls practiced similar personal hygiene during menstruation. However, in the present study, a high percentage of female students reported that they take a shower every day (87.7%) or after 1-2 days (93.4%) during menstruation and that washing the genitalia while showering is recommended, which is in contrast with Bhattacharjee et al.'s study in West Bengal, which observed that less than one third of girls practiced good personal hygiene. Mudey et al. reported that only 34.33% of the girls cleaned their genitalia.<sup>[15-31,48-51]</sup>

Activities and exercise restrictions were varied among the girls in the present study as the majority of them did not attend schools or perform routine household work or participate in family events; they preferred to sleep and rest. This is possibly due to different rituals in the community; the girls followed the practices of their mothers or other elderly women in the family. These findings were consistent with other previous studies on adolescents in similar communities.<sup>[45-47,52]</sup> The majority of female adolescents in the present study followed correct RH practices, which is consistent with the study by Gothankar et al. in India.<sup>[53]</sup> In regard to female adolescents' attitude toward aspects of RH, the majority had positive attitude regarding the importance of puberty education, personal hygiene during menstruation,

usefulness of family planning methods for female RH, STD risk for the fetus, and the need for RH services to be accessible for adolescents, which is consistent with the study results of Lamadah et al. and Tegegn et al.<sup>[19-37,48-51]</sup> However, these results contradict those of Fetohy who found that the mean score of students' attitudes toward personal hygiene during menstruation was low among adolescents.<sup>[5]</sup> The participants had negative attitudes toward teenage pregnancy and close frequency of pregnancies that may threaten the mother's and fetal health, which contradicts the results of Lamadah et al.<sup>[37]</sup> This may be a result of social traditions that prefer pregnancy at a young age and gestations that are not spaced apart.

## 5. CONCLUSION

In the light of the current study findings, it is concluded that RH knowledge among the adolescents was unsatisfactory based on the correct answers (33.7%), while more than two-thirds (66.3%) of the participants had incorrect knowledge. The present study revealed that the majority of the adolescents did not have correct knowledge about puberty, pregnancy and childbirth, family planning methods, STDs, and request for treatment. On the other hand, adolescents had correct knowledge about the appropriate age for marriage and HIV than other STDs. Regarding the hygiene practices, most students had correct practices with respect to menstruation, while a few had incorrect practices. The majority had positive attitudes regarding RH, while a few had negative attitudes.

## Recommendations

- (1) Health care professionals and nurses must be trained properly to provide RH services at schools and primary health care settings.
- (2) Primary health care practitioners should be well-prepared to provide education about RH to increase parental involvement to improve care quality for adolescents.
- (3) Safe RH can be achieved by incorporating family education, which focuses on learning about living, family, and social relationships through well prepared nurses who can provide education at schools for parents and teachers.
- (4) Future nursing research should focus on RH. A similar study can be conducted on the same topic with a broader perspective by evaluating a few schools from each region in the KSA.

## CONFLICTS OF INTEREST DISCLOSURE

The authors declare that there is no conflict of interest.

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