



Original Research Article

## Assessment of Beliefs and Practices Relating to Menstrual Hygiene of Adolescent Girls in Lebanon

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Received: 22/09/2013

Revised: 30/10/2013

Accepted: 13/11/2013

### ABSTRACT

**Introduction:** Poor menstrual hygiene prevents achieving the several Millennium Development Goals. The aim of this study was to assess menstrual hygiene practices based on sociocultural beliefs of adolescent girls in Lebanon.

**Methods:** A community-based cross-sectional survey was conducted, in 2010, among 389 post-menarcheal adolescent girls aged 13 to 19 years, at five high schools in Sidon city and suburbs, using a cluster randomized sampling and self-completed questionnaires. Collected data was analyzed by using descriptive and inferential statistics.

**Results:** Of 389 participants, 89.5% did not follow all menstrual hygiene practices recommended, they adopted menstrual practices based on the dominant sociocultural beliefs found in the Lebanese society about these matters: 66.9% and 16.5%, respectively, did not shower in the first three days of menstruation or during all days of menstruation, and activity restrictions included physical (70.3%) and social (18.2%) activity and diet (35.5%).

A significant association was found between describe menstrual hygiene practices based on sociocultural beliefs and type of school, religion, both parents' education levels, as well as family monthly income. Logistic regression analyses indicated that significant variables predicting describe menstrual hygiene practices based on sociocultural beliefs were mother level education (OR = 2.8; P < 0.001), and religion (OR = 0.7; P = 0.002).

**Conclusion:** Findings indicate the need for health school education programs during puberty; they also can help design appropriate intervention strategies.

**Keywords:** practices of menstrual hygiene, sociocultural beliefs, adolescent girl.

## INTRODUCTION

Menstruation is a normal, recurrent, physiological event. <sup>[1]</sup> The onset of menstruation is one of the most important changes occurring in girls during adolescent years. <sup>[2]</sup>

Good menstrual hygiene practices are essential during menstruation; they include 1) regular change of clothing and underwear; 2) change of hygienic pads every three to four hours; 3) daily showering, especially in instances of dysmenorrhea; 4) adequate washing of genitalia after each voiding of urine and/or feces; 5) continuing normal routine and daily activities (e.g. going to school, doing physical exercise), and 6) maintaining a balanced diet with plenty of fruits and vegetables rich in iron and calcium. <sup>[1]</sup>

Despite these recommendations, menstrual hygiene practices are poor in developing countries. <sup>[3]</sup> While it is recognized that the adoption of appropriate hygienic practices is crucial in the prevention of reproductive tract infections, <sup>[2-7]</sup> the incidence of gynaecological morbidity is suffered by many women in hushed silence, <sup>[8, 9]</sup> bearing in mind that having a safe personal and cultural environment to manage menstruation hygienically and with dignity is the right of every woman and adolescent girl. <sup>[10]</sup> In fact, good menstrual hygiene will directly contribute to achieve the MDG-2 on universal education and the MDG-3 on gender equality and women empowerment. <sup>[8,9,11]</sup>

Nevertheless, it has been demonstrated that menstrual hygiene practices are still lacking and vary according to sociocultural beliefs prevalent in different societies. <sup>[12,13]</sup>

This situation potentially jeopardizes the sexual reproductive health of millions of postmenarcheal women and adolescent girls living in developing countries <sup>[14,15]</sup> and its

consequences constitute a significant burden due to the enormous financial costs of health care services particularly in these countries. <sup>[16-18]</sup>

Very few studies, conducted in developing countries, have revealed that girls usually share the customs and sociocultural beliefs of their parents. <sup>[4, 5, 19-22]</sup> Additionally, mothers, teachers and friends are the primary source of information related to menstrual awareness <sup>[19, 21,23]</sup> for adolescent girls. Social prohibitions and negative attitudes of parents in discussing the related issues openly have blocked the access of adolescent girls to the appropriate of information. <sup>[9]</sup> As concerns menstrual hygiene, this is often synonymous in these countries with folk wisdom and traditions handed down from one generation to the next, some of which may be traced back to very ancient times. <sup>[5]</sup> Many adolescent girls today live in communities where traditional beliefs run counter to, and prevent them from adopting what is generally considered good menstrual hygiene practices. <sup>[4, 15]</sup> Instances of such problematic practices may be observed during a girl's menstrual cycle; in fact, some adolescent girls eating foods rich in vitamin C, and exercising may be avoided during menstruation on the presumption that they stop menstrual flow and induce amenorrhea. <sup>[5, 24]</sup>

Promoting sexual and reproductive health of adolescent girls concerns all community members, educators, and health care professionals, particularly specialists in health promotion. It requires an enabling environment both physically and socially, as suggested in the International Conference on Population and Development in 1994, Cairo <sup>[3, 25, 26]</sup> to which Lebanon is a signatory.

However, the attention on this issue is far from sufficient. <sup>[27]</sup> In Lebanon, to the best of our knowledge, studies on MHPBSB in Lebanese teenage girls are inexistent. The

aim of the present study was to identify of current beliefs, practices and the level of awareness in adolescent Lebanese schoolgirls as prerequisite for development appropriate interventions to promote their optimal quality of life.

## **METHOD**

### ***Study design and sample***

The data presented in this paper is part of a larger community-based, cross sectional study that was conducted among Lebanese adolescent girls living in Sidon city and suburbs, in 2010. [28] Usually, schoolgirls, in this area, receive an education session (45 minutes) on menstrual hygiene practice from non-governmental organizations in collaboration with the Lebanese Ministry of Education. The educational program started 10 years ago with an objective to improve awareness and menstrual hygiene practices for girls, in grade 7, both in public and private schools. A variety of information is provided with an overview about puberty, the physiology of the menstrual cycle, and lifestyle during menstruation. [29]

For determining the appropriate sample size in this study, we calculated a sample size using an alpha of 0.05 and power > 0.90. The sample size estimated to be at least 131 participants in each school for this study was sufficient to detect a difference in the use for cleaning purpose of 0.13 between private and public schools.

### ***Data collection***

#### ***Field procedures***

After obtaining the approval of “Sidon’s School Network” and the schools’ principals, participants were recruited using a cluster random sampling technique and all the students who met the inclusion criteria within the selected schools were recruited on a voluntary basis. First, a list of all the schools in greater Sidon, Lebanon, was obtained from the Ministry of Education and

Higher Education, Centre for Educational Research and Development.

Inclusion criteria were being post-menarcheal schoolgirls in academic years (grades) 8 to 12 (age 13–19 years) in the 5 selected schools (n = 435 schoolgirls). 36 girls did not meet the inclusion criteria and 9 refused to participate yielding a total number of 389 girls who completed the questionnaire and were included in the final analysis of this study (response rate of 97.7%).

During data collection, participants were asked to answer anonymously a self-administered and structured questionnaire. On average 25 minutes were needed to complete the questionnaire printed in English. Questionnaires were administered and collected on the same day during a class. Data collection took place between February 2010 and March 2010.

### ***Study instrument***

The questionnaire consisted of five parts:

- 1) Demographic questions, including 8 multiples choice items about nationality, age, type of school, school grade, parents’ educational level, and family monthly income.
- 2) Personal hygiene during menstruation. This consisted of 4 multiple-choice and open-ended questions to investigate the personal hygiene during menstruation, the type of sanitary pads used and frequency of changing pads, genital cleaning methods and showering during menstruation.
- 3) Awareness about menstruation. This section included 4 semi-open-ended questions (yes and No, why?) concerning menstruation, information of menstruation before menarche, sources of information, need for more information about menstrual hygiene and the ideal

resource person to provide further information on the subject.

- 4) Menstrual Hygiene Practices Based on Sociocultural Beliefs scale (MHPBSB). The scale included 7-item dichotomous and open-ended questions (yes and No, why?). Items assessed relevant information: not remove unwanted hair (depilation), eating habits like not drinking cold water, or foods with vitamin C, touch plants or baby, walk barefoot, and participate in social activities or physical activity. If the subject answered correctly, it was rated as 1; if answered incorrectly, it was rated as 0. All the correct responses were accumulated from 0 to 8. For each girl the mean score on the 8 items formed a composite score (between 0–1) where 1 reflected more favourable overall MHPBSB. The cut-off point of 0.5 in this composite score was used to divide the schoolgirls into 2 groups: unfavourable MHPBSB (score 0–0.5) and favourable MHPBSB (score > 0.5–1). The Kuder-Richardson reliability coefficient was 0.75 in this study.
- 5) The adolescent's perception of menstruation. This consisted of one open-ended question: "What do you want to tell your daughter in the future about menstruation and menstrual hygiene?"

All these questions were inspired by previous studies that revealed a significant relationship between socio-demographic factors, practices, and sociocultural beliefs regarding menstrual hygiene. [4, 19, 20, 30-32]

#### ***Ethical Considerations***

The study protocol was approved by the Ethics Review Board of the Lebanese Ministry of Education. Participant and

parental consent were obtained. Participants were recruited after being informed of the purpose of the study and assured of confidentiality. They were also assured of their right to withdraw from the study at any time without consequences, and that participation was entirely voluntary.

#### ***Statistical Analysis***

Data are presented in tables reporting frequencies and percentage as appropriate. The chi-squared test was used to examine the relationship between personal hygiene during menstruation and demographic characteristics, MHPBSB and demographic characteristics. Test-retest was performed over a 2-week period with 33 volunteers. Logistic regressions were applied to predict MHPBSB among adolescent girls in Sidon, Lebanon based on demographic characteristics.

Data were analyzed using SPSS statistical software package, version 16. (SPSS Inc., Chicago, IL USA). A *p*-value of less than ≤ .05 was used to indicate a statistically significant association.

## **RESULTS**

In total, 389 out of 418 adolescent girls participated in the study, for a response rate of 97.7 %.

#### ***Demographic and menstruation characteristics***

The majority of participants were Lebanese (87.5%), ranging in age from 13 to 19 years, with a mean of 15.1 years (Table 1). Grades 8 to 10 were almost equally represented (23.4%, 23.4%, and 27.0%, respectively), with the remainder of the participants split evenly between grades 11 and 12. Fully one-third of parents were university-educated (33.6% of mothers and 34.2% of fathers). Family income was below \$1000 US for 15.2% of the families and above \$3000 US for 21.6% of families (the mid-to-upper income bracket) (Table 1).

Table 1: Demographics characteristics among adolescent girls in Sidon city, Lebanon (n = 389).

Variables	Total No.	%*
<i>Nationality</i>		
Lebanese	331	85.1
Another	58	14.9
<i>Age (years)</i>		
[13-15]	150	38.6
[16-19]	239	61.4
<i>School</i>		
Private	245	63.0
Public	144	37.0
<i>Grade</i>		
8 <sup>th</sup>	91	23.4
9 <sup>th</sup>	91	23.4
10 <sup>th</sup>	105	27.0
11 <sup>th</sup>	57	14.7
12 <sup>th</sup>	45	11.6
<i>Religion</i>		
Sunnite	260	66.8
Shiite	129	33.2
<i>Father education</i>		
Primary	65	16.7
Elementary	104	26.7
Secondary	87	22.4
University	133	34.2
<i>Mother education</i>		
Primary	35	9.0
Elementary	103	26.5
Secondary	120	30.8
University	131	33.7
<i>Monthly family income</i>		
<1000\$	59	15.2
1000-2000\$	145	37.3
2000-3000\$	101	26.0
>3000\$	84	21.6

\* Percentages rounded up to the nearest whole number

### ***Awareness and Personal hygiene about menstruation***

Table 2 shows an overview of key girls' awareness and personal hygiene followed by adolescents during menstruation.

- Personal hygiene during menstruation. All participants (100%) used disposable absorbency products. About half of the girls (51.5%) changed sanitary pads every

8 to 10 hours; 40.4%, every 3 to 4 hours; and 8.7%, once every 24 hours. The majority of the adolescents did not shower until after the third day of menstruation (66.9%) or during all days of menstruation (16.5%) to avoid the putative risks of "bleeding" (hypermenorrhea), "cessation of menstrual flow" (amenorrhea) and/or "water cysts" (ovarian cysts). Most adolescent girls (95.4%) said they washed their genitalia after urination during menstruation, with 42.2% using ordinary soap and water so as to remove impure blood and 40.9% using water only.

- Awareness about menstruation. Most girls (95.4%) reported receiving information regarding menstruation from a number of sources simultaneously. The principal source was the mother (86.9%), followed by school (65.0%), friends (33.2%), older sister (21.6%), television (12.9%), health care professionals (12.3%), and grandmother (11.6%). Over half (54.0%) were interested in receiving further information regarding proper hygiene. The preferred provider of information was the mother (50.0%), followed by school (23.8%) and health care professionals (15.5%).

### ***Menstrual Hygiene Practices Based on Sociocultural Beliefs Scale***

Regarding different types of restrictions practiced during menstruation (Table 3), 189 (49.4%) girls did not practice any restriction. Two hundred (50.6.5%) girls said they followed customs and practiced different restrictions during menstruation based on their sociocultural beliefs. For instance, 24.0% would not remove unwanted hair (depilation) because hair was impure during menstruation, 35.5% changed their eating habits with 22.0% not drinking cold water, 20.0% avoided foods with vitamin C so as to prevent risks of amenorrhea, 20.0% did not touch plants or baby, 19.0% would not walk barefoot, 18.2% did not participate in social activities or in doing

housework. Among the 47.6% of adolescents who were usually physically active, 70.3% avoided such activities due to the perceived risk of “bleeding” (hypermenorrhea). To summarise, 49.4% had unfavourable MHPBSB scoring below 0.5 and 50.6 % had favourable MHPBSB, scoring between 0.5 and 1.

Table 2: Information related to personal hygiene and awareness about menstruation among adolescent girls in Sidon city, Lebanon (n = 389)

Variable	Total	
	No.	%
<b>Personal hygiene during menstruation</b>		
<i>Material use for absorbing blood</i>		
Sanitary pads	389	100
New cloth pieces	0	0.0
Old cloth pieces	0	0.0
Some combination	0	0.0
<i>Cleaning of external genitalia</i>		
Yes	371	95.4
No	18	4.6
<i>Use for cleaning purpose</i>		
Only water	159	40.9
Ordinary soap and water	164	42.2
Detergent & water	19	4.8
Gentle hygiene product & water	29	7.5
Non-precise	18	4.6
<i>Frequency to change of sanitary pads</i>		
Once every 24 hours	4	1.0
Twice every 24 hours	43	11.1
Three every 24 hours	152	40.4
Every 3 to 4 hours	157	40.4
Another	30	7.7
<i>Showering during menstruation</i>		
First day	91	23.4
Second day	141	36.2
Third day	93	23.9
Last day	64	16.5
<b>Awareness about menstruation</b>		
<i>Information of menstruation before menarche</i>		
Yes	371	95.4
No	18	4.6
<i>Source of awareness about menarche*</i>		
Mother	338	86.9
School	253	65.0
Friend	129	33.2
Old sister	84	21.6
Television	50	12.9
Health professional	48	12.3
Family member	47	12.1
Grand-mother	45	11.6
Internet	25	6.4
Father	15	3.9
Another	3	0.8
<i>Need for more information of menstrual hygiene</i>		
Yes	210	54.0
No	179	46.0
<i>Ideal resource person to provide further information (n=181)</i>		
Mother	92	50.8
School	43	23.8
Health care professionals	28	15.5
Friend	10	5.5
Non precise	8	4.4

\* For this question, schoolgirl can choice multiple source from list at the same time.



Table 3: Information related to sociocultural belief and practices about menstrual hygiene among adolescent girls in Sidon city, Lebanon (n = 389)

Variable	Negative		Positive	
	No.	%	No.	%
<i>Score of sociocultural beliefs regarding menstrual hygiene</i>	348	89.5	41	10.5
Remove hair	294	75.6	95	24.4
Food habits change	222	64.5	167	43.0
Touch plants or baby	331	80.0	78	20.0
Walk barefoot	315	81.0	74	19
Participate in social and household activities	338	86.8	51	17.2
Take shower	129	33.1	260	66.9
Physical Activity (n= 293)	87	29.7	206	70.3

### **Perception of Menstruation**

When asked, 28.3% of participants intended to tell their daughters about menstruation using “negative terms”, 57.0% responded that “this is everything I know” or “this is what my mother told me” and 14.7% didn’t answer.

### **Inferential analysis**

Personal hygiene and demographic characteristics. The washing of genitalia after urinating during menstruation was associated with most demographic variables listed in table 4. Schoolgirls, aged between 15 and 19 were more likely to washing genitalia after urinating or feces during menstruation ( $p= 0.044$ ), in the private schools (65.0%) in comparison with schoolgirls in the public schools (35.0%) with  $p < 0.001$ . Sunni Muslims tends more to say yes (69.0%) in comparison with Shiite Muslims schoolgirls (31.0%) with  $p=0.004$ . The percentage also increases as father’s education level increase ( $p= 0.008$ ).

Adequate “cleaning purpose” was significantly increased for schoolgirls in private schools compared with schoolgirls in public schools were, 458.2% and 1.2% respectively ( $p < 0.001$ ), and for Sunni Muslims schoolgirls compared with Shiite Muslims schoolgirls, were 75.9% and 24.1% respectively ( $p < 0.001$ ).

Number of changes of sanitary pads was directly associated with the type of school attended ( $p < 0.001$ ) where girls in private

schools tended more to say yes (54.3%) in comparison with girls in the public school (45.7%), and the percentage increased as monthly family income increased ( $p = 0.048$ ). Similarly, the percentage of showering during menstruation was significantly increased with the increase the father’s education level ( $p = 0.011$ ). No other significant demographic characteristics were noted.

MHPBSB and demographic characteristics. Chi-square tests showed a highly significant association between MHPBSB score and the type of school attended ( $p < 0.001$ ), the religion ( $p < 0.001$ ), the mother’s and the father’s education level, were  $p < 0.001$  and  $p = 0.002$  respectively, and the family monthly income ( $p < .001$ ). In fact, schoolgirls in private school (72.5%) were more likely to have a positive MHPBSB score in comparison with girls in public schools (27.5%), Sunni Muslims (78.3%) compared with Shiite Muslims (21.7%), as well as with the mother’s and the father’s education level increase, and the family monthly income increase. No significant relationship was found between MHPBSB and nationality, age, or grade level (Table 5).

### **Predictive of MHPBSB**

The results of logistic regressions with MHPBSB as the dependent variable show that the risk of unfavorable score was significantly higher at Shiite Muslims

schoolgirls (OR = 0.716; 95% CI: 0.577-0.888) and win the mother's level education

decrease (OR = 2.840; 95% CI: 1.819-4.434).

Table 4: Personal hygiene during menstruation and Demographic characteristics among adolescent girls in Sidon city, Lebanon (n = 389)

Variables	Personal hygiene during menstruation																			
	Cleaning of external genitalia					Use for cleaning purpose(n=371)					Frequency to change of sanitary pads			Showering during menstruation						
	Yes		No		P-value	Yes		No		P-value	Yes		No		P-value	Yes		No		P-value
	No.	%	No.	%		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%	
<b>Nationality</b>	0.191					0.270					0.292			0.350						
Lebanese	313	84.4	18	12.9	22	75.9	291	85.1	202	87.1	129	82.2	257	86.2	74	81.3				
Another	58	15.6	0	0.0	7	24.1	51	14.9	30	12.9	28	17.8	35	11.7	13	14.3				
<b>Age (years)</b>	0.044*					0.119					0.601			0.336						
[13-15]	139	37.5	11	61.1	20	69.0	127	37.1	87	37.5	63	40.1	111	37.2	39	42.9				
[16-19]	232	62.5	7	38.9	9	31.0	215	62.9	145	62.5	94	59.9	187	62.8	52	57.1				
<b>School</b>	<0.001*					0.001*					<0.001*			0.361						
Private	241	65.0	4	22.2	20	58.8	221	64.6	126	54.3	119	75.8	184	61.7	61	67.0				
Public	130	35.0	13	77.8	14	41.2	121	35.4	106	45.7	38	24.2	114	38.3	30	33.0				
<b>Grade</b>	0.124					0.414					0.773			0.971						
8 <sup>th</sup>	83	22.4	8	44.4	7	24.1	76	22.2	54	23.3	37	23.6	71	23.8	20	22.0				
9 <sup>th</sup>	86	23.2	5	27.8	8	27.8	78	22.8	56	24.1	35	22.3	71	23.8	20	22.0				
10 <sup>th</sup>	101	27.2	4	22.2	6	20.7	95	27.8	63	27.2	42	26.8	80	26.8	25	27.5				
11 <sup>th</sup>	57	15.4	0	0.0	4	13.8	53	15.5	36	15.5	21	13.4	43	14.4	14	15.4				
12 <sup>th</sup>	44	11.9	1	5.6	4	13.8	40	11.7	23	9.9	22	14.0	33	11.1	12	13.2				
<b>Religion</b>	<0.001*					<0.001*					0.072			0.609						
Sunnite	256	65.8	3	16.7	22	75.9	234	68.4	146	62.9	113	72.0	196	65.7	102	34.2				
Shiite	114	29.2	15	83.3	7	24.1	107	31.3	86	37.1	43	27.4	102	34.2	27	29.7				
<b>Father education</b>	0.008*					0.058					0.832			0.011*						
Primary	63	17.0	2	11.1	4	13.8	59	17.3	42	18.1	23	14.6	46	15.4	19	20.9				
Elementary	93	25.1	11	61.1	7	24.1	86	25.1	62	26.7	42	26.8	89	29.9	15	16.5				
Secondary	84	22.6	3	16.7	7	24.1	77	22.5	51	22.0	36	22.9	58	19.5	29	31.9				
University	131	35.3	2	11.1	11	37.9	120	35.1	77	33.2	56	35.7	105	35.2	28	30.8				
<b>Mother education</b>	0.501					0.609					0.218			0.802						
Primary	32	8.6	3	16.7	2	6.9	30	8.8	24	10.3	11	7.0	29	9.7	6	6.6				
Elementary	97	26.1	6	33.3	10	34.5	87	25.4	59	25.4	44	28.0	78	26.2	25	27.5				
Secondary	115	31.0	5	27.8	6	20.7	109	31.9	78	33.6	42	26.8	90	30.2	30	33.0				
University	127	34.2	4	22.2	11	37.9	116	33.9	71	30.6	60	38.2	101	33.9	30	33.0				
<b>Monthly family income</b>	0.065					0.252					0.048*			0.686						
< 1000\$	53	14.3	6	33.3	4	13.8	49	14.3	43	18.5	16	10.2	47	15.8	12	13.2				
1000-2000\$	137	36.9	8	44.4	12	41.4	125	36.5	89	38.4	56	35.7	114	38.3	31	34.1				
2000-3000\$	98	26.4	3	16.7	8	27.6	90	26.3	58	25.0	43	27.4	76	25.5	25	27.5				
> 3000\$	83	22.4	1	5.6	5	17.2	78	22.8	42	18.1	42	26.8	61	20.5	23	25.3				

\*Significant association with p ≤ 0.05



Table 5: Menstrual Practices Based on Sociocultural Beliefs and Demographic characteristics among adolescent girls in Sidon city, Lebanon (n = 389)

<b>Menstrual practices based on sociocultural beliefs regarding menstrual hygiene</b>							$\chi^2$	P-value
<b>Variables</b>	<i>Favourable</i>		<i>Unfavourable</i>		<b>Total</b>			
	No.	%	No.	%	No.	%		
<b>Nationality</b>							0.17	0.918
Lebanese	162	85.7	169	84.5	331	85.1		
Another	27	14.3	31	13.0	58	14.9		
<b>Age (years)</b>							0.0	0.230
[13-15]	121	38.6	29	38.5	150	38.6		
[16-19]	168	61.4	71	61.5	239	61.4		
<b>School</b>							14.3	< 0.001*
Private	137	72.5	108	54.0	245	63.0		
Public	52	27.5	92	46.0	144	37.0		
<b>Grade</b>							3.46	0.484
8 <sup>th</sup>	42	22.2	49	24.5	91	23.4		
9 <sup>th</sup>	40	21.2	51	25.5	91	23.4		
10 <sup>th</sup>	51	27.0	54	27.0	105	27.0		
11 <sup>th</sup>	29	15.3	28	14.0	57	14.7		
12 <sup>th</sup>	27	14.3	18	9.0	45	11.6		
<b>Religion</b>							23.1	< 0.001*
Sunnite	148	78.3	112	43.1	260	66.8		
Shiite	41	21.7	88	68.2	129	33.2		
<b>Father education</b>							9.1	0.027*
Primary	29	15.3	36	18.0	65	16.7		
Elementary	39	20.6	65	32.5	104	26.7		
Secondary	48	25.4	39	19.5	87	22.4		
University	73	38.6	60	30.0	133	34.2		
<b>Mother education</b>							20.5	< 0.001*
Primary	18	9.5	17	8.5	35	9.0		
Elementary	36	19.0	67	33.5	103	26.5		
Secondary	52	27.5	68	34.0	120	30.8		
University	83	43.9	48	24.0	131	33.7		
<b>Monthly family income</b>							16.1	< 0.001*
< 1000\$	21	11.1	38	19.0	59	15.2		
1000-2000\$	59	31.2	86	43.0	145	37.3		
2000-3000\$	57	30.2	44	22.0	101	26.0		
> 3000\$	52	27.5	32	16.0	84	21.6		

Table 6: Multiple logistic regression analysis of predictive factors of Practice and sociocultural beliefs regarding menstrual hygiene among adolescent girls in Sidon city, Lebanon (n = 389).

Variable	$\beta$	P-value	OR	95% CI
Mother level education	1.044	<0.001	2.840	1.819-4.434
Religion	-0.334	0.002	0.716	0.577-0.888

Model fit = 51.4%,  $-2 \log$  likelihood = 505.895,  $\chi^2$ . = 33.062.691,  $P < 0.001$

OR = odds ratio, CI = confidence interval

## DISCUSSION

In this study, we sought to determine the MHPBSB of adolescent girls in Lebanon with respect to menstruation. We found that beliefs affected diet, participation in social activities, physical activity, and lifestyle during menstrual periods. The type of school attended (public or private), religion and both parents' education levels affected MHPBSB. Similarly, the father's education level was directly related to showering or lack thereof.

Indeed, the mother was the primary provider of information about menstruation and related hygiene for most participants (86.9%). This finding was consistent with those of other studies: 80% in Malaysia, [23] 64.9% in India, [21] 60.7% in Taiwan, [32] and 61.0% in Iran. [33] Furthermore, in this study we identified the MHPBSB decreased with the decrease of the mother's level education.

Up to 4.6% of adolescent girls did not receive any information regarding menstrual hygiene. This result, however, was well below the level found in other countries. For example, two studies in Iran found that 22.0% and 33.0% of girls, respectively, did not receive information about menstruation before puberty, [33, 34] as compared to 37.3% in Ananda, [32] and 44.8% in Niger. [19] Furthermore, over half of the adolescent girls in the current study requested more information. As in other developing countries, the amount of information received was deemed insufficient by participants. [11, 30, 32, 34, 35]

Although all participants used disposable sanitary products and 95.1% cleaned their genitalia after urination, the practices of menstrual hygiene did not attain the standards described by UNICEF. [1] Only 40.4% of adolescent girls changed sanitary pads every 3 to 4 hours; fewer than 25.0% showered on the first day of menstruation; and 7.5% said they cleaned their genitals after urination using gentle soap and water. While it is unrealistic to expect intimate genital washing in public restrooms (variously known as "toilets" or "washrooms") in schools or at the workplace, adherence to proper wiping from front to back with clean toilet paper and changing pads at each visit to the toilet should be emphasized.

Research conducted with adolescents in Niger and India showed that only 32.7% [38] and 11.25% [2] used disposable sanitary pads. In addition, Moawed's [5] study showed that 42.5% of adolescent girls changed their pad every eight hours and 65% never cleaned their genitalia during menstruation. [5] The study by Dasgupta and Sarkar, [2] however, showed that, though bathing and a proper change of absorbent materials were insufficient, 85.0% of respondents cleaned their genitalia at least once a day during menstruation, 97.5% of these with ordinary soap and water. [2] This finding must be due to the schools' infrastructure. Public schools in the current Lebanese economic climate are lacking in sanitary facilities and usually do not have an environment adequate for allowing girls to change pads every 4 hours.

The current study revealed that menstruation restricted the social life of 89.5% of students. Among participants, almost one-quarter would not do hair depilation during their period or drink lemon beverages or cold water; one out of five do not share in social activities or in doing housework during menstruation. This was

consistent with the study of Gujjars in India showing that 15.0% of adolescent girls did not participate in social ceremonies during menstruation. [39] In addition, Indian adolescent girls did not participate in ceremonies (43.7%) or social activities with family (36.2%) during menstruation. [32] In Saudi Arabia, young girls did not drink juice with vitamin C and indeed changed their eating habits during menstruation. [5]

### ***Strengths and limits of the study***

Despite these findings that will surely contribute to an increased understanding of beliefs and practices surrounding menstrual hygiene in Sidon and its suburbs in the 21<sup>st</sup> century, some limitations to our study must be addressed. The cross-sectional nature of the survey distribution prevented us from determining a temporal sequence of events. Secondly, the risk of bias related to social desirability was practically inevitable in the context of self-reporting of such a sensitive subject. [40, 41] However, the guarantee of anonymity and the conduct of the study at a familiar environment (school) have probably helped to diminish over/under-reporting of this nature. As concerns generalizability to other populations and contexts, it is important to realize that customs and beliefs may vary between regions and peoples, although certain beliefs based on ancient principles are shared.

Nevertheless, this study succeeded in providing useful information about menstrual health care issues among Lebanese schoolgirls and could help the Ministry of Education to develop and initiate appropriate steps for updating school curricula in order to educate schoolgirls regarding this important health issue. Health education should be developed to empower schoolgirls with sufficient awareness so that they shift to appropriate health practices.

## **CONCLUSION**

The results of this study indicate a need for establishing a comprehensive school health education program that addresses components of puberty education. Appropriate strategies must be developed to increase awareness and address some of the issues raised, and thus empower adolescent girls with the necessary life skills to ensure a healthy future lifestyle. At the community level, mothers of adolescent girls should be educated about menstrual and pubertal hygiene. Furthermore, this study confirms that MHPBSB in the observed sample of Lebanese girls are inadequate to prevent risk of reproductive tract infections, and that adolescent girls in Lebanon are a population at risk. Underlying these practices are sociocultural beliefs that control social life as well as adequate hygiene practices during menstruation.

In the future, it would be beneficial to adopt a combination of quantitative and qualitative approaches that would explore sudden changes in growth during the perimenarcheal phase, and to conduct longitudinal experimental studies to assess effectiveness of programs taking into consideration sociocultural beliefs. Research should use larger sample sizes and include mothers along with adolescent girls is needed to produce sufficient and comprehensive results on a national level.

Proper sexual and reproductive health promotion interventions would be more than welcome to alleviate this problem [19, 30, 39] and promote health of these girls and women. A key priority for women and girls is to have the necessary awareness, facilities and the cultural environment to manage menstruation hygienically and with dignity. [9]

Promotion for menarche should ideally begin in the early years. Hence, schools and families should collaborate to help adolescents during their puberty

through a unique interaction with School nurses. Through a cooperative effort, adolescents can receive continuous, quality care both at home and at school. <sup>[42]</sup>

### ACKNOWLEDGMENTS

The authors are grateful to the authorities of the Sidoon's School Network in Sidon city and its Suburbs, school principals, the students and their families for the kindly cooperating during data collection. Also we extend our gratitude to the Antonine University represented by the Department of Nursing and all its members.

They would also like to acknowledge with thanks Dr. Sophie Dupéré, Dr. Michel O'Neill and Dr. Francois Desbiens of Université Laval for critical revision of the manuscript.

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How to cite this article: Santina T, Wehbe N, Ziade FM et. al. Assessment of beliefs and practices relating to menstrual hygiene of adolescent girls in Lebanon. *Int J Health Sci Res*. 2013;3(12):75-88.

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