

Original Article

Syrian mothers, why to accept or to refuse HPV vaccine for their teen girls

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Abstract

Background: Cervical cancer (CC) ranks the eighth most frequent cancer among Syrian women with crude incidence rates 1.4 per 100, 000 populations per year. This study aimed to test the acceptance of the human papillomavirus (HPV) vaccine among mothers of schoolgirls in sixth-grade class.

Methods: A cross-sectional survey was conducted through a structured and self-administrated questionnaire. A total of 400 Syrian mothers of schoolgirls were selected randomly by the cluster sampling method in Aleppo city, Syria, in 2011. Significant variables from univariate analysis were included in an enter technique multiple logistic regression analysis.

Results: The response rate was 86%. If the vaccine was free, 282 (81.7%) mothers would accept the vaccine for themselves and 236 (68.4%) for their daughters, respectively. However, the acceptance rate grossly decreased to 24.6% and 15.1%, respectively, if the vaccine was not provided free. The high cost of the HPV vaccine and lack of knowledge were the significant barriers for mothers' acceptance of the HPV vaccine. Protection of daughters and the trust with health authority were the main encouraging reasons to accept the HPV vaccine. Findings from logistic regression analysis revealed that the employed mothers (odds ratio = 2.4; 95% CI: 1.3–4.4), with a positive history of gynecological examination (OR = 2.1; 95% CI: 1.6–2.9) and having sound knowledge (OR = 2.4; 95% CI: 1.0–5.7) are independent factors related to the acceptance of the HPV vaccine for their daughters.

Conclusion: The results from this study suggest that mothers from different cultural backgrounds, including Syrian mothers, are holding different beliefs on privacy and health that may affect their willingness to accept the HPV vaccine.

Keywords: Human Papillomavirus, Cervical Cancer, Vaccine, Aleppo, Syria

Background

Human papillomavirus (HPV) is one of the common sexually transmitted viral infections [1]. HPV16 and HPV18 are known as high-risk serotypes due to their ability to cause cervical cancer (CC), while serotypes 6 and 11 were confirmed to cause genital warts [2]. The first HPV vaccine was approved by the United States Food and Drug Administration (USFDA) in 2006 to be used in girls and women ages 9-26 years old. The HPV vaccine was designed only to prevent infection and not for treatment. Nevertheless, this vaccine gives protection against the four high-risk serotypes; HPV16 and HPV18, which correspond to 70% of all cervical cancer cases; and HPV6 and HPV11, which cause 90% of anogenital warts [3]. Parents greatly influence HPV vaccine acceptance. Particularly, the

mothers' acceptance has found to be positively associated with HPV vaccine uptake among their daughters [4]. The acceptance rate of HPV vaccine among mothers is approximately in the range between 55 to 96% worldwide [5-8]. Several factors found to influence the mothers' acceptance of HPV vaccines, such as lack of knowledge [5,9-11], risk perception [9,12,13], and doctors' recommendations [5,9,12,14-20]. Some other factors are disputable such as mother's age [6,13,21,24], education level [7,12,21], vaccine cost consideration [8,9,17-19,26], overall belief and attitude toward vaccines [5,7,12,17,25,26]. At the end of 2010, Syria has an estimated total population of more than 20 million people. Females of 15 years and older (the age for developing CC) were about 6.01 million women [27].

The crude incidence rates of CC related to HPV are 1.4 per 100 000 population of Syrian women per year compared to 6.2 in Tunisia, 4.5 in Sudan, 2.4 in Jordan, 2.1 in Iraq, and 1.3 in both Egypt and Saudi Arabia [27]. Recently, the HPV vaccines

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have been licensed in over 120 countries, including some of the Arab world countries such as Egypt, Saudi Arabia, Kuwait, Bahrain, United Arab Emirates, and Morocco. However, in 2012 only six of low and middle-income countries (LMICs) were implementing national HPV vaccination program [28,29], that is why assessing of mother's acceptance of this vaccine before developing and implementing similar vaccination program is very important.

Methods

Study design and participants

This quantitative cross-sectional survey was conducted through a structured and self-administrated questionnaire at the primary schools in Aleppo Governorate, Syria. At the beginning of the year 2011, the Aleppo governorate was the largest city in the northeast part of Syria, with an estimated total population of 6,235,000. The purpose of the study was explained to all potential participants, and all those who agreed to take part gave written consent before participation.

Sampling technique

Between April and May 2011, a cluster sampling technique was recruited to collect a sample of 345 mothers of sixth-grade schoolgirls. In the first stage, twenty schools randomly selected in an average of four schools from each of the north, south, east, west, and central areas of Aleppo. In the second stage, one of the sixth-grade classes in each of these 20 schools randomly selected. All the schoolgirls (aged 12-13 years old) in the selected classes with their mothers were encouraged to participate in the study. Only female, primary, public schools in Aleppo city that function during the day time were included. Schools that only serve special needs students and evening schools were excluded.

Study instrument

The questionnaire was based on and virtually identical to previously published two studies in Belgium and Turkey, respectively [7,21]. With the help of two gynecologists and one family physician, minor modifications were made before and after a pilot trial (20 mothers) aimed at adapting the questionnaire to the Arabic population. The questionnaire contained a total of forty questions divided into three sections: socio-demographic and economics (part 1), knowledge of mothers about HPV infection and vaccination (part 2), and mother acceptance of the HPV vaccine for their daughters and reasons for acceptance and non-acceptance (part 3).

Sample size calculation

Because of the regional, cultural, religion and socio-demographical considerations, the acceptance rate of 76% from the Turkish study [8] was assumed to calculate the sample size using the formula: $n = (Z_{1-\alpha})^2 [(P(1-P)/D^2)]$. So, $n = (1.96)^2 \times (0.76) \times (0.24) / (0.05)^2 = 280$. Non-response correction = 20%. Thus, the total sample size with provision for drop-outs from the study = $280 + 20\% (56.0) = 336$.

Statistical analysis

Data are presented as mean \pm standard deviation (SD) or as numbers. All statistical analysis was carried out using the SPSS

program, version 16 (SPSS Inc, Chicago, IL, USA). The bivariate analysis was done using the chi-square test. Multiple logistic regressions (Enter technique) were done to control for confounders and to obtain a predictive model of mother's acceptance of the HPV vaccine. All tests were two-sided, and a P-value of < 0.05 was considered statistically significant.

Results and Discussion

Descriptive analyses

Out of 400 questionnaires distributed to mothers, 345 of them returned the completed forms through their daughters, making the response rate of 86%. At baseline, the sample studied was mostly young, unemployed mothers with low education (secondary school or less) and low economic status. The mean age was 37 ± 6.4 years old (Table 1).

Table 1 Mothers' socio-demographic, gynecological and daughters' vaccination histories (n=345)

Characteristics	N	%
Age (years)		
40 years old or more	115	33.3
Less than 40 years old	230	66.7
Education level		
High education (higher than secondary school)	86	25.0
Low education (secondary school or less)	259	75.0
Employment		
Yes	70	20.3
No /unknown	275	79.7
Family income level (Syrian Lira)		
Low (15,000 & less)*	109	31.6
High (more than 15,000)	236	68.4
Unknown	134	38.8
History of gynecological examination in the last five years		
Yes annually	50	14.5
Yes some times	184	53.3
No	111	32.2
History of cervical cancer screening		
Yes	35	10.1
No	310	89.9
History of Pap smear / and result		
Yes / abnormal	4	1.2
Yes / normal	50	14.5
No or I don't know	291	84.3
Mother or one of her relatives had been diagnosed with cancer		
Yes	124	35.9
No	221	64.1
Daughter's History of childhood immunization		
Yes, immunized with all childhood vaccination	318	92.2
Not immunized or Unsure	27	7.8
Daughter's History of adverse effects in previous vaccination		
Positive	39	11.3
Negative	306	88.7

* USD 1 = Syrian Lira 48 in 2011

Gynecological and vaccination outcomes

At the time of the study, most of the mothers reported a positive history of gynecological examination in the last five years with a positive family history of cancer in 35.9%. However, most of

them had a negative history of cervical cancer screening and Pap smear tests. The highest percent 92.2% of schoolgirls in the sixth grade had received their all childhood vaccines, and few of them experienced some adverse effects after vaccination, such as rising in temperature or localized swelling (Table 1).

Level of knowledge

A 14 item questionnaire tested mothers' knowledge in three areas; cervical cancer (4 questions), HPV infection (6 questions), and HPV vaccine (4 questions) [11]. The total knowledge score is the sum of all the knowledge questions and can range from 0 to 14. A score of 7 or more was considered good knowledge. The mean knowledge score was 2.67±2.3, and only 42 (27.8%) mothers had good knowledge (score seven or more) compared to 303 (72.2%) mother had poor knowledge (score six or less) (Table 2). An internal consistency value of 0.8 Cronbach's Alpha was reported for all questions.

Table 2 Descriptive statistics of mothers' knowledge score in cervical cancer, HPV infection, HPV vaccine and total knowledge score (n=345)

Knowledge scores	Cervical cancer (4 items) f (%)	HPV infection (6 items) f (%)	HPV vaccine (4 items) f (%)	Total score (14 items) f (%)
0/ not heard	46 (13.3)	292 (84.6)	264(76.5)	35 (10.1)
1	77 (22.3)	11 (3.2)	47 (13.6)	56 (16.2)
2	117 (33.9)	16 (4.6)	27 (7.8)	53 (15.4)
3	86 (24.9)	8 (2.3)	5 (1.4)	70 (20.3)
4	19 (5.5)	7 (2.0)	2 (0.6)	37 (10.7)
5	-	10 (2.9)	-	37 (10.7)
6	-	1 (0.3)	-	15 (4.3)
7-8	-	-	-	25 (7.2)
9-10	-	-	-	12 (3.4)
11-12	-	-	-	4 (1.2)
13-14	-	-	-	1 (0.3)

Mothers' acceptance of HPV vaccine

The vast majority of 282 (81.7%) of mothers had accepted the vaccine for themselves and 236 (68.4%) for their daughters. However, the acceptance rate grossly decreased to 24.6% for mothers and 15.1% for daughters, respectively, if the vaccine was not provided free of charge (Table 3).

Reasons to accept or to refuse HPV vaccine

About tow third 236 (68.4%) mothers had accepted the HPV vaccine for their daughters, either they want to protect their daughters (184, 77.9%), or because of the vaccine is approved by a health authority (53.9%). Other less important reasons such as their belief in all vaccinations (29.2%), respect for doctor's recommendation (24.1%), and risk perception of cervical cancer (23.7%). While the 109 (31.6) mothers who refused the vaccine for their daughters, mostly 48 (44.0%), need more information before making the final decision. However, the vaccine's adverse effects and believing that their daughters are not at risk of cervical cancer are also other important reasons (Table 4).

Table 3 Acceptance of HPV vaccine for mothers and for their daughters (n=345)

Option and responses	Acceptance	
	Oneself N (%)	Daughter N (%)
(A) Mother's acceptance of HPV vaccine provided free of charge		
Yes	282(81.7)	236 (68.4)
No	63(18.3)	109 (31.6)
(B) Mother's acceptance if the price of the HPV vaccine would be 15000-20000 Syrian Liras (USD 300-500)		
Yes, the price is no problem for me	85 (24.6)	52 (15.1)
No, because it is too expensive	85 (24.6)	71 (20.6)
No, because I need more information before I accept	162 (47.0)	161 (46.7)
No, due to other reasons	13 (3.8)	20 (5.8)
No, I will wait for my husband to decide	-	41 (11.9)

Table 4 Reasons to accept (n=236) and to refuse (n=109) HPV vaccination for daughters

Reasons to accept HIV vaccine	N	%
I want to protect my daughter	184	77.9
Cervical cancer is a serious disease and can affect any woman.	56	23.7
Since the health authority approves this vaccine, it is save	127	53.9
Since this vaccine recommended by doctors, it is important to my daughter	57	24.1
I accept all vaccination, HPV no different	69	29.2
I have one relative or friend affected by cervical cancer	3	1.3
Reasons to refuse HIV vaccine	N	%
I need more information to make a decision	48	44.0
I am afraid of the vaccination side effect	17	15.6
This is a new vaccine, and not enough research has been done	7	6.4
My daughter is not at risk of cervical cancer	15	13.8
My daughter is too young to take vaccination against sexually transmitted diseases	9	8.3
I don't believe in vaccines and HPV is no different	6	5.5
Other reasons	7	6.4

Bivariate analysis

Seven factors are found to play a role in improving mothers' acceptance of the HPV vaccine for their daughters. These factors, including the employed mothers, with high family income, having a positive history of gynecological examinations, have undergone screening for CC, having a positive history of Pap smear test, with a positive attitude toward vaccination themselves and those with good knowledge (Table 5).

Table 5 Mother's socio-demographic and health-related factors associated with free HPV vaccine acceptance for their daughters

Factor	Free HPV vaccine acceptance for daughter		p-value
	N	F (%)	
Employment status			0.019
Yes	70	56 (80.0)	
No / unknown	275	180 (65.5)	
Family income level(Syrian Lira)			0.037
Low(15000& less)/unknown	243	158 (65.0)	
High (more than 15000)	102	78(76.5)	
Gynecological examination in last 5years			0.014
Yes (annually/ sometimes)	234	170 (72.6)	
No	111	66 (59.5)	
History of cervical cancer screening			0.020
Yes	35	30 (85.7)	
No	310	206 (66.5)	
Mother's knowledge level			0.026
Good	42	35 (83.3)	
Poor	303	201(66.3)	
Mothers acceptance of free vaccine for themselves			0.0001
Accepted	282	223 (79.1)	
Refused	63	13 (20.6)	
Pap smear /result			0.010
Yes / (normal /abnormal)	54	45 (83.3)	
No/ I don't know	291	191(65.6)	

Logistic regression analysis

Multiple logistic regression was run to determine which of the study variables best explain the variation in mothers' acceptance for HPV vaccine for their daughters (enter technique). The total model was significant (p<0.001) and accounted for 22.8% of the variance (Nagelkerke R Square=0.228). The Hosmer and Lemeshow Test indicated a good fit (p= 0.33). Employed mothers (OR) = 2.4; confidence interval (CI): 1.3–4.4; P < 0.005) with positive history of gynecological examination (OR = 2.1; CI: 1.6–2.9; P < 0.001) and good knowledge (OR = 2.4; CI: 1.0–5.7; P < 0.041) were independent factors related to the acceptance of the HPV vaccine (Table 6). The probability of mother to accept the HPV vaccine for her daughter is $=1/1+e^{-z}$, $Z= (0.874*\text{employment status}) + (0.750*\text{Gynecological examination}) + (0.885*\text{good knowledge level})$.

Table 6 Logistic regression of mothers' acceptance for HPV vaccine for their daughters

Variables	B	S.E.	Sig.	Exp (B)	95% C.I L-U*
Employment					
No (Reference)					
Yes	0.874	0.314	0.005	2.4	1.3-4.4
Gynecological examination					
No (Reference)					
Yes	0.75	0.157	0.000	2.1	1.6-2.9
Knowledge level					
Poor (Reference)					
Good	0.885	0.434	0.041	2.4	1.0-5.7

*L: lower; U: upper

Discussion

WHO report, published in 2010, estimated around 147 new cases of cervical cancer in Syria each year [27]. However, the number of unknown cervical cancer cases due to undiagnosed or unrecorded cases expected to be high. Moreover, the sensitivity of sexual issues in Arab societies increases the chances of denied cases of sexually transmitted diseases (STDs).

In the current study, out of 345 participated mothers, only 35 (10.1%) had undergone cervical cancer screening, and 50 (14.5%) have had an annual gynecological examination. Clearly, this study showed a low coverage rate of the cervical cancer screening program in Syria. The previous study from Turkey supports this finding indicated that around 38% of women (aged 17-80 years old) have had an annual gynecological examination [30].

Unfortunately, very few Syrian mothers (12, 3.5%) have correctly defined females (aged 15-24 years old) as the age group at higher risk of HPV infection. This low-risk perception of HPV infection and poor knowledge levels may partly explain why they were more accepting of HPV vaccination for themselves (81.7%) than for their daughters (68.4%). Similarly, findings have been seen among Turkish women (90% vs. 64%) [30]; however, the reverse has been reported in some other studies from United States [24-26] and Belgium [21].

Determinants of mothers to accept HPV vaccination for their daughters

Employment and family income are interrelated factors and differently affecting the acceptance of HPV vaccination. In the present study, employed mothers had a significantly higher acceptance rate towards the HPV vaccination for daughters (OR=2.4, 95%CI 1.3-4.4, p =0.005) compared to unemployed mothers. Moreover, about 76.5% of mothers who had higher family income (more than 15,000 Syrian lira /monthly) accepted the HPV vaccination for daughters compared to 65% of mothers with either unknown or low family income (OR=1.7, 95% CI 1.01-3, p =0.037). Dursun et al. [30] found that the employed Turkish women were more accepting of the HPV vaccine than unemployed women (61% vs. 40%, P < 0.0001), however, there was no significant difference in the HPV vaccine acceptance rate according to family income and most of them (88%) were believed that the government should pay the cost of vaccination.

Contrary to our findings, conditions when the parents not gainfully employed [7] or at lower income were more likely to support the acceptance of HPV vaccination [5]. Although most respondents in this study, 303 (72.2%) lacked good knowledge concerning CC, HPV infection, and its vaccine, however mothers who had good knowledge accepted the HPV vaccine for their daughters more than mothers who had poor knowledge. Understandably, willingness and the intention to vaccinate associated with awareness and knowledge about HPV [7,12].

Medical counseling has a significant impact on family attitude and the final decision to vaccinate the daughters even prior to the sexual debut [22]. Moreover, the more trained caregivers were, the more likely to correctly classify illnesses and help mothers to make the right decision [31].

In this study, mothers who had a positive history of gynecological examination and positive history of cervical cancer screening were more likely to accept the HPV vaccine for their daughters than their counterparts. Moreover, among the participants, 54 (15.7%) mothers have experienced Pap smear tests, and only four cases were reported with abnormal history; however, these mothers are significantly more accepting of the HPV vaccine for their daughters than the others. Similar findings were reported among Turkish women [30].

Results from countries such as the USA [22,24], Canada [12] and the Netherlands [23] found that the younger mothers or parents are more likely to accept HPV vaccination than older women or parents. However, in this study, there was no significant relationship between the age of mothers and their decision to accept the HPV vaccine for their daughters. Surprisingly, families with higher education levels were associated with a decreased likelihood of having daughters receive the HPV vaccine [6,7,13]. In previous studies [5,9,11], maternal education was related to excellent knowledge of CC and HPV infection; however, in our study, there was no significant association between higher maternal education and the acceptance rate of the HPV vaccine.

Why mothers accept HPV vaccine for daughters

The majority of Syrian mothers who have accepted the HPV vaccine for their daughters have cited the protection and the trust in health authority approval as the most important reasons or additional reasons. Similar findings were reported in the USA [32] and Canada [6].

In most developed [5,9,15,17] and developing countries [14,19] including our study, the recommendations from the healthcare providers have indicated to be the most important influencing factor in deciding to get vaccinated. However, future research on health care providers' attitudes toward the vaccine could improve the interplay between health care providers and patients. Therefore information from health care providers could be important for successful vaccine uptake. Considerably, one-third of Syrian mothers accepted the HPV vaccine because they strongly believed in all vaccinations. The effectiveness of vaccine seven and the parents' belief in vaccines were other prominent factors [32].

Why mothers refuse HPV vaccine for daughters

About one third (31.6%) of Syrian mothers did not accept the HPV vaccine for their daughters. The economic burden and testing the willingness to pay are essential considerations before introducing the vaccine. The acceptance rate came down to only 15.1% for daughters and 24.6% for Syrian mothers if the vaccine is chargeable. Similar findings are found among Swedish parents of children (aged 12-15 years old); 76% of them were willing to vaccinate their daughters if the vaccine is for free, and 63% were willing to pay for the vaccine [7].

In the current study, the average monthly income of the families was 21, 201 (SD 14, 495) Syrian lira. The HPV vaccine appears to be very costly for Syrian families. This high cost makes mothers hesitate to pay for the HPV vaccine and consequently could influence the vaccine uptake in all over Syria. Moreover, Syrian people have a high vaccine uptake in the national vaccination program (92.2% in this study). Except

for the HPV vaccine, the national vaccination program offers free vaccinations through public health services. That is why some of the Syrian mothers might expect the HPV vaccine to be free as well. The financial situation and decision of the family is the prerogative of the husband in most Syrian families, which may also explain the tending of about 11.9% of mothers waiting for their husbands to make the final decision [20].

The lack of sufficient information negatively reflected in the opinion of about half (46.7%) of Syrian mothers. Mothers have hesitated and asked for more information about the HPV vaccine before accepting to pay for vaccination. This fact has also been reported by Onan et al. (2009) among Turkish women; 61.5% required more information about the vaccine before they could decide to get the vaccine [9]. Dempsey et al. (2009) found evidence that low-risk perception of HPV infection was one of the common reasons for refusing the vaccine [9]. As expected, among Syrian mothers who participated in this study, only 8.7% of them knew that both men and women could be affected by HPV infection and 96% of them either chose the incorrect age group at highest risk for acquiring HPV or they did not know the age-associated with this. Of the Syrian mothers surveyed, 10.4% were aware that HPV is transmitted via sexual intercourse. Moreover, the minority, only 8.4% of mothers, realized that HPV infection could lead to cancer.

A picture of low-risk perception about HPV infection appeared among Syrian mothers who refused the HPV vaccine because they thought that their daughters are not at risk of cervical cancer (13.8%); afraid of the possible unknown side effects of the vaccine (15.6%); thought that their daughters were too young to be vaccinated against sexually transmitted diseases (8.3%); thought that no enough research had been done on this new vaccine (6.4%) and the negative attitude towards vaccines in general (5.5%).

Such findings are supported by Dempsey et al. (2006), who found that parents concern about the lack of knowledge, safety, and the perception that their daughter was too young as factors associated with declining acceptance of the HPV vaccine [9]. In Canada, Ogilvie et al. [6] also found that the overall attitude to vaccines was predictive of parents having a daughter receive the HPV vaccine in a publicly funded school-based HPV vaccine program. The main reasons for not having a daughter receive the HPV vaccine were concerned about the HPV vaccine safety (29.2%), preference to wait until their daughters get older (15.6%).

Strength and limitations

We believe this study has made an essential contribution to the plan in the HPV vaccine implementation in Syria and Arabic countries. This study was clarified the reason behind mothers' acceptance in two ways. Directly, we asked Syrian mothers about the reasons for accepting or refusing the HPV vaccine. Statistically, we tried to found a significant relationship between mother acceptance and factors by performing the bivariate and multivariate analysis.

The study sample was collected from schools within the city of Aleppo and did not include the rural areas around Aleppo. For that, we can claim that the result of the study is representative of Syrian mothers' acceptance from the urban

area but not rural areas. Because CC is a disease of women, we assumed that the acceptance of the mothers for the HPV vaccine is essential to the success of the vaccination program. Some previous studies were done among both parents, while this study was done among mothers only. Decision-making in some families may involve both the father and mother.

Conclusions

The results from this study suggest that the Syrian mothers who participated differ from other populations in terms of their reasons for accepting the HPV vaccine. Mothers from different cultural backgrounds hold differing beliefs on privacy and health that may affect their willingness to accept the vaccine that prevents STDs. The acceptance rate of the HPV vaccine is positively related to low cost or free of charge vaccine. Lack of knowledge was a significant barrier for mothers to accept the HPV vaccine. Protection of daughters and the trust with health authority were the main two reasons encouraging mothers to accept the HPV vaccine for their daughter. However, mothers who are working with a positive history of gynecological examination and good knowledge were the most influential factors affecting the acceptance of the HPV vaccine in logistic regression.

We recommend further studies to confirm the findings of this study. Cost-effectiveness studies to test the affordability of vaccines are critical. More effort must need to educate Syrian mothers through the media and educational campaign about sexually transmitted diseases (including HPV) and an association between HPV infection and CC.

Abbreviations

CC: Cervical Cancer; HPV: human papillomavirus; USFAD: United States Food and Drug Administration; LMICs: Low and Middle-Income Countries; UKMMC: University Kebangsaan Malaysia Medical Centre; Odes Ratio: OR; Standard Deviation: SD; Sexual Transmitted Diseases: STDs.

Declarations

Acknowledgment

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Availability of data and materials

Data will be available by emailing drsaadalezzi@gmail.com.

Authors' contributions

MA is the principal investigator of the study who designed the study and coordinated all aspects of the research, including all steps of the manuscript preparation. SAJ contributed to the study design, analysis, and interpretation of data, drafting the work, writing, reviewing, editing, and approving the manuscript. All authors read and approved the final manuscript.

Ethics approval and consent to participate

We conducted the research following the Declaration of Helsinki, and the protocol was approved by the Research and Ethics Committee, University Kebangsaan Malaysia Medical Centre (UKMMC), and approved by the Council of College of Medicine (FF-186-2011 in 26th April 2011). Moreover, written informed consent was obtained from

each mother willing to participate after an explanation of the study objectives and the guarantee of secrecy.

Consent for publication

Not applicable

Competing interest

The authors declare that they have no competing interests.

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