

RESEARCH COMMUNICATION

Knowledge Towards HPV Infection and HPV Vaccines among Syrian Mothers

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Abstract

Cervical cancer is caused by HPV infection and can be prevented by early vaccination. **Objective:** To assess Syrian women's level of knowledge and determinants of good knowledge of cervical cancer, HPV infection and its vaccines. **Methods:** A cross sectional survey was undertaken among mothers with daughters in sixth grade classes enrolled in primary schools in Aleppo city, Syria. Samples were selected through cluster sampling and data collected using a self-administered questionnaire. **Results:** Less than a third of the mothers had heard of HPV infection and vaccines against cervical cancer and levels of knowledge were generally low. Good knowledge was associated with high education level, higher family monthly income, having few - less than four children, positive history of cervical cancer screening, and working or having relatives working in the medical field. The main source of information was television and few reported health care providers as a source of knowledge on HPV infection and vaccine. **Conclusion:** Since knowledge of HPV infection and its connection with cervical cancer and its vaccine are low, more efforts must be made to educate Syrians prior to introduction of any HPV vaccination programme. Public health efforts must focus on educating mothers, the public as well as health care providers.

Keywords: HPV infection - HPV vaccine - cervical cancer - knowledge - mothers - Syria

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Introduction

Cervical cancer burden is very high in developing countries and most of these cases were attributed to the well known HPV virus (Thun et al., 2010; Tota et al., 2011). This cancer is preventable by available and trustable vaccine and we should encourage effort for establishing and maintaining HPV vaccination programmes in our countries. Syria has a population of 6.01 million women ages 15 years and older, the age for developing cervical cancer. Every year about 147 cases were diagnosed as cervical cancer in Syria, and about 56 women will die due to the same disease. This cancer is the eighth most frequent cancer among Syrian women between the ages of 15 and 44 years, and the ninth among women of all ages. According to the WHO report on Syria and HPV related disease, the crude incidence rates of cervical cancer related to HPV is 1.4 per 100,000 population of Syrian women per year (WHO/ICO, HPV and Related Cancers Summary Report Update, 2010). Although cervical cancer is relatively low in Syria, this could be due to underreporting.

HPV knowledge and awareness in many countries especially developing countries are still low (Anorlu 2008; Cuzick et al., 2008). Onan et al., (2009) found that among Turkish women, only 24.8% claimed they had heard about HPV infection and 24.3% had heard of the HPV vaccine.

In another survey on 525 Turkish women aged between 19 and 53 years, Ilter et al., (2009) found most of them (56%) had never heard of HPV. Cooper Robbins et al., (2010) in a qualitative study about the HPV vaccine post-implementation in schools in Australia among girls and their parents said that the lack of knowledge was common in three domains. These domains were what HPV is, how HPV is transmitted, and on the HPV and cervical cancer connection. The lack of knowledge about HPV vaccination was reflected in what the vaccine protects against, how the vaccine works, HPV vaccination recommendations, the vaccine and Pap smear connection, and myths about HPV vaccination.

Donders et al., (2007) in their study among women in Belgium found that young age (youngsters, aged 25 years or less) was a risk factor for poorer knowledge about HPV, cervix cancer and the HPV vaccine than older women, 40 years old and more, even though the degree of education in this group of youngsters was significantly higher (79% had a postgraduate or university degree versus 43.4% in the ± 40 women, p value = 0.006). Of the youngsters, 27% had never heard of the vaccine versus 15% in the 40+ age group ($p = 0.0013$); 61.7% versus 39.1% answered that they did not know anything about cervix cancer ($p = 0.019$), and only 12.8% versus 32.6% knew that HPV was a virus and not a bacterium or cancer ($p = 0.01$). Of the youngsters, 78% did not know anything about HPV

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versus only half (53%) of the older women (p = 0.006). Syria is yet to have an HPV vaccination programme and we have limited knowledge on the level of knowledge and awareness of the HPV infection and vaccination among Syrian women.

We hypothesized that knowledge level is higher among older women, those with higher education level, higher monthly income and those who had undergone gynaecological examination and screening for cervical cancer or Pap smear test. Thus we conducted a study to assess Syrian women's level and determinants of knowledge of cervical cancer, HPV infection and the HPV vaccine.

Materials and Methods

Study Type, Time and Place

This was a cross sectional survey of Syrian women with daughters enrolled in Aleppo primary schools carried out between April to May 2011. The Aleppo Governorate is the most populous governorate in Syria. Aleppo is the largest city in Syria and is the capital of the Aleppo Governorate. The governorate has about 3,890 schools; 3,301 are primary schools of which 398 are in Aleppo City proper and 2,203 schools are in the smaller cities, villages and rural area in the rest of the governorate.

Population and Sample Group

Respondents were Syrian women with daughters enrolled in the sixth grade (between 12 to 13 years old) in primary schools in Aleppo city proper. We used cluster sampling and the sample frame consisted of all primary schools in Aleppo city. We first randomly selected four schools from the north, south, east, west and central parts of the city and in the 20 selected schools, we randomly selected a sixth grade class. All mothers of school girls in the selected class were recruited to participate in the study.

Data Collection

Data for the study was collected using self-administrated questionnaire. The questionnaire, consent form and respondent information sheet were sent via schoolgirls in the selected sixth grade classes to their mothers at home. We asked mothers to answer the questionnaire during their free time, on their own knowledge and awareness of cervical cancer and HPV infection and vaccination without help from anyone. The completed questionnaires with the signed consent form were returned through their daughters to the researchers the following day. The questionnaire consists of several parts, a part on the socio-demographic and economic background as well as a part for assessing their knowledge of cervical cancer, and HPV infection and vaccination. We developed our questionnaire based on two previous studies by Donders et al., (2007) in Belgium and Onan et al., (2007) in Turkey. Mother's knowledge was tested using a 14 item questionnaire. One (1) mark was given for every correct response and zero (0) for an incorrect response. The total knowledge score is the sum of all the knowledge questions and can range between 0 to 14 and a score of 7 or more is considered good knowledge.

The questionnaire was translated into the Arabic language, and then back translated into English to ensure accurate translation. The Arabic questionnaire was validated in Syria by two gynaecologists and one family physician. A pilot test was conducted to check if the questionnaire was easily understood and modifications were done to improve the phrasing of questions in the questionnaire. Internal consistency value for all knowledge questions showed Cronbach's alpha of was 0.8.

Results

A total of 400 questionnaires were distributed to mothers and 345 (86%) mothers returned the completed forms through their daughters. In the study, 66.7% of mothers were less than 40 years old and their mean age was 37±6.4 years (range 26-74 years). Among these mothers, 75% had low education (secondary school or less) and only 20.3% of these mothers were employed. With regards family income, 31.6% had low income (equal or less than 15,000 Syrian Lira), 29.6% had high income (more than 15,000 Syrian Lira) and a third (38.8%) declined to report their family income. In this study, 35.7% of these mothers reported working or having relatives who had worked in a medical setting. Fifty (14.5%) mothers reported ever having an annual gynecological examination in last 5 years, 35 (10.1%) mothers had undergone cervical cancer screening and 124 (35.9%) had positive family history of cancer.

Table 1. Respondents' Responses to Knowledge Questions (n=345)

Question	Don't know/ never heard f (%)	FALSE f (%)	TRUE f (%)
Some viruses can cause cancer (True)	129 (37.4)	35 (10.1)	181 (52.5)
Cervical cancer is caused by a bacterium (False)	154 (44.6)	57 (16.5)	134 (38.8)
Cervical cancer only effect old women (False)	94 (27.2)	222 (64.3)	29 (8.4)
Cervical cancer is a preventable disease (True)	117 (33.9)	43 (12.5)	185 (53.6)
HPV is the virus that causes herpes (False)	311 (90.1)	13 (3.8)	21 (6.1)
HPV can cause genital warts (True)	305 (88.4)	8 (2.3)	32 (9.3)
HPV don't cause cancer (False)	307 (89.0)	29 (8.4)	9 (2.6)
HPV infection can affect both women and men (True)	296 (85.8)	19 (5.5)	30 (8.7)
PAP smears are not necessary after vaccination with HPV vaccine (False)	282 (81.7)	45 (13.1)	18 (5.2)
Mode of HPV infection transmission (Sexual intercourse)	297 (86.1)	12 (3.5)	36 (10.4)
Age group at the highest risk of acquiring HPV (15-24 years old)	301 (87.2)	32 (9.3)	12 (3.5)
% of the cervical cancers can be prevented by a vaccine (70%)	272 (78.8)	46 (13.3)	27 (7.8)
Appropriate age for vaccination (10-12 year)	279 (80.9)	28 (8.1)	38 (11.0)
The number of doses required for vaccination (Three)	302 (87.5)	29 (8.4)	14 (4.1)

Table 2. Differences in Good Knowledge Scores According to Socio Demographic Factors, Odds Ratio, 95% CI and p-value

Factor	Poor		Good		n	p value	OR (95% CI)
	f	%	f	%			
Age of mother (years)							
0.727	0.9 (0.4-1.8)						
≥40	102	88.7	13	11.3	115		
<40	201	87.4	29	12.6	230		
Education level							
						0.004	2.6 (1.3-5.1)
< high school	235	90.7	24	9.3	259		
> high school	68	79.1	18	20.9	86		
Working status							
						0.310	1.5 (0.7-3.1)
Yes	59	84.3	11	15.7	70		
No	244	88.7	31	11.3	275		
Family monthly income (Syrian Lira)							
						0.006	2.5 (1.3-4.7)
< 15K	221	90.9	22	9.1	243		
> 15K	82	80.4	20	19.6	102		
Number of children							
						0.027	0.4 (0.2-0.9)
< 4	185	84.9	33	15.1	218		
> 4	118	92.9	9	7.1	127		
Working or having relatives working in medical setting							
						0.006	2.5 (1.3-4.7)
Yes	100	81.3	23	18.7	123		
No	203	91.4	19	8.6	222		
History of gynecological examination							
						0.216	1.6 (0.8-3.4)
Yes	202	86.3	32	13.7	234		
No	101	91.0	10	9.0	111		
History of cervical cancer screening							
						0.010	2.9 (1.3-6.7)
Yes	26	74.3	9	25.7	35		
No	277	89.4	33	10.6	310		
Family history of cancer							
						0.513	1.2 (0.6-2.4)
Yes	107	86.3	17	13.7	124		
No	196	88.7	25	11.3	221		

When asked about HPV infection and its vaccine, 62 (18%) asserted they had heard about HPV infection and a third of mothers had heard of a vaccine for preventing cervical cancer (n=118, 34.2%). Among those who had heard of the HPV vaccine, their main source of information was television (50%), friends and family (22.9%), their family physician (14.4%) and lastly internet (9.3%).

Table 1 shows their responses to the 14-item knowledge questions. Specifically, 64.3% knew that cervical cancer do not only affect old women, and 53.6% correctly defined cervical cancer as a preventable disease. On HPV infection, 36 (10.4%) indicated that sexual intercourse was the way of transmission for HPV infection, 29 (8.4%) mothers knew that HPV can cause cancer, and 12 (3.5%) mothers responded that the group aged 15-24 years is at highest risk of cervical cancer. Only 38 (11%) mothers correctly indicated that the 10-12 years old is the appropriate age of vaccination and only 14 (4.1%) knew the dosing scheme of the HPV vaccine.

Their mean knowledge score was 2.7±2.3 on a 0-14 scale, mode and median was 2, and 30 (10.1%) mothers had zero as their knowledge score. Only 42 (27.8%) mothers had good knowledge (score 7 or more) and 303 (72.2%) mother had poor knowledge (score 6 or less). The Chi square tests were used in this study to determine the factors associated with good knowledge scores. Table 2 shows that factors significantly associated with good

knowledge score were high education level (p=0.004), higher family monthly income (p=0.006), having less than four children (p=0.027), positive history of cervical cancer screening (p=0.01) and mothers who reported working or having relatives working in the medical field (p =0.006).

In order to determine which of the study variables best explained the variation in good knowledge score, multiple logistic regressions were done (using backward LR technique). All variables which were significantly associated with good knowledge score in the bivariate analysis were entered in the logistic regression model. The significant predictors of good knowledge in this model after controlling for confounders were higher income (OR=2.3, 95%CI= 1.2-4.5; p= 0.018), mothers who had screened for cervical cancer (OR=2.6, 95%CI= 1.1-6.2; p= 0.036) and mothers who had fewer, less than 4 children (OR=2.4, 95%CI= 1.1-5.3; p= 0.034). However the model only explained 11.4% of the variance in good knowledge scores (Nagelkerke R Square = 0.114).

Discussion

More than 5 years had passed since the US FDA licensed the HPV vaccine against HPV infection (2006). Since then many countries had introduced the HPV vaccination program. Syria has yet to do so, and to date the level of knowledge of the HPV infection and vaccine among Syrian women had so far been unexplored. To our knowledge, this study is the first attempt in the Arab countries to explore the knowledge of mothers of this new vaccine. This information can be the cornerstone for establishing suitable education programs, and deciding on appropriate strategies when implementing such vaccination programme in Syria. Results of this study showed low knowledge scores since the mean scores was 2.7±2.3. This low level of knowledge was found among women living in the Aleppo city proper and the findings may be even lower if conducted in the rural outskirts of the city of Aleppo. Knowledge of cervical cancer was acceptable but the level of knowledge was poor when it comes to HPV infection and the HPV vaccine. Donders et al., (2007) found among Belgian women, 50.4% answered cervical cancer is caused by virus compared to only 16.5% of our Syrian mothers who gave similar answer. However, more Syrian mothers (53.6%) said that cervical cancer is preventable compared to Belgian women (41.7%).

Very few, 18% Syrian mothers had heard of HPV infection at the time of the study. Similar low levels were also seen in other populations. A recent study in Indonesia conducted by Jaspers et al., (2011) among parents with at least one daughter aged 0-14 years found only 16.6% of parents had heard of the HPV infection. Slightly higher percentages were reported among Turkish women with 24.8% in the study done by Onan et al., (2007) and 45% women having heard of the HPV infection in the study by Dursun et al., (2007). In contrast, in the United States, Munsell et al., (2009) reported that 95% of American mothers in Texas had already heard of the HPV infection. However, in an earlier study only 36% of rural American women had heard of HPV infection (Fazekas et al., 2006). Syrian mothers had lower knowledge of HPV infection

regarding gender affected, mode of transmission, high risk group and its connection with cervical cancer compared to other populations (Fazekas et al., 2006; Onan et al., 2007; Munsell et al., 2009). For example, only 10% of Syrian mothers compared to 75% Turkish and over 90% American women identified sexual intercourse as a mean of transmission of HPV infection. Similarly very few Syrian mothers knew that HPV infection can affect both genders and this has important public health implications since the role of men must be considered in the control of HPV transmission.

In regards to HPV vaccines, a third of our Syrian mothers had heard of the HPV vaccine and this is higher than the 15% found among Indonesian parents in a study by Jasper et al., (2011). This is also higher compared to earlier studies among Turkish (Onan et al., 2007) and rural American women (Fazekas et al., 2006). However fewer Syrian women had heard of the HPV vaccine compared to 87.5% of Belgian women who had heard of the vaccine prior to introduction of HPV vaccine in Belgium (Donders et al., 2007). These differences could be due to the difference in the way of the questions were asked. In our study, we asked women whether they had heard of the vaccine for the prevention of cervical cancer, while the other studies asked whether they had heard of the HPV vaccine.

When asked on specifics, fewer than 15% Syrian mothers knew of the specific timing, dosing and connection between HPV vaccine and pap smear and this has important implication on the introduction of HPV vaccination programme for young girls aged 12 to 13 years old.

We found higher maternal education, higher family monthly income, having fewer children, having history of cervical cancer screening, and working or having relatives working in the medical field were significantly associated with good knowledge scores. Donders et al., (2007) found Belgian women with higher education had better knowledge. The same finding was found by Tiro et al., (2007) among American women. Logically, families with high income would make it easier for their members to access information. In the same manner, mothers who had fewer children may have more time to acquire information and knowledge on health issues including HPV vaccine. Likewise, mothers who worked or had relatives working in the medical field could have better access to health information.

Mothers who had cervical cancer screening also had good knowledge. However we do not know whether their screening experiences lead to higher knowledge or their higher knowledge lead them to cervical screening. Tiro et al., (2007) found American women who had abnormal pap smear test had more knowledge about cervical cancer. We were not able to test this association since the number of women who had abnormal screening results were too few. Donders et al., (2007) reported better knowledge among older women, while in the study by Tiro et al., (2007) the younger ones were significantly better informed. We did not find any significant association between age and good knowledge. This could be due to the younger women having better level of education compared to the

older counterpart.

In Syria, television is the most important source of knowledge among those who had heard about the HPV vaccine while very few had heard about it through the internet. This finding is consistent with previous studies in Turkey, Belgium and Texas, USA (Onan et al., 2007; Donders et al., 2007; Munsell et al., 2009). Despite the rapid shift towards the use of the Internet as a source of information, television is still the main source for disseminating medical information.

Prior to introducing any HPV vaccination in Syria, a health education and promotion campaign on the connection between HPV infection and cervical cancer, and the role of HPV vaccination must be conducted to improve awareness of this issue among Syrians. Specific information on the timing, dosing and target population related to young girls should be included since very few knew of this. Educational campaigns on this new vaccine must focus on its protective role for cervical cancer, safety of the HPV vaccine, appropriate timing of vaccination, the need for continued Pap smears and how HPV is transmitted. We must continue to use television since it is an important source for medical information among Syrians. Public health effort for increasing awareness of the HPV vaccine could be done through schools by giving information sheets for children to pass to their parents. Educating health workers on this vaccine is also needed since very few mothers reported health providers as the source of information on HPV.

Results from this study concluded that Syrian mothers had low knowledge of HPV infection and vaccination. Studies among rural women may show an even lower level of knowledge of HPV infection and vaccine. Prior to introduction of any HPV vaccination programme, public health effort must focus on the educating the public as well as the health care providers. Higher knowledge of HPV and its vaccine may influence acceptance and success of HPV vaccination programme in Syria.

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