

RESEARCH ARTICLE

Awareness of Cervical Cancer and Pap Smear Testing Among Omani Women

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Abstract

Background: In developed countries, awareness of cervical cancer screening is well documented. In contrast, in Oman as a developing country, public responses regarding cervical screening are unclear. This study aimed to assess the level of awareness about cervical cancer and Papanicolau (Pap) smear testing and to establish any correlations between knowledge and demographic factors among Omani women. **Methods:** In this cross-sectional survey, participants were divided into three groups: patients who attended the Outpatient Gynecology Department in Sultan Qaboos University Hospital (SQUH), Oman, female staff from SQUH, College of Medicine and College of Nursing at Sultan Qaboos University (SQU) and graduating female students at SQU. Data collection was through interview-based and online self-administered questionnaires. Cumulative scoring was used for data analysis. **Results:** There were 204 outpatients, 133 staff and 157 students. Outpatients (79.4%), staff (97.7%) and students (75.2%) had heard of cervical cancer. Nevertheless, their specific knowledge, regarding signs and symptoms, risk factors and Pap smear, was low at 38.7%, 35.3% and 7.6% among outpatients, staff and students, respectively. Some 39.9% of the married outpatients had adequate overall knowledge as compared to none of the single women. Educational level was found to be significantly associated with outpatient knowledge with the highest awareness levels among postgraduates and medical university graduates (61.5%). **Conclusion:** Specific knowledge of cervical cancer, its risk factors and cervical Pap smear is generally poor among Omani women. This lack of knowledge may be one of the contributing factors for the high incidence of cervical cancer in Oman relative to that in developed countries.

Keywords: Cervical cancer- awareness- Pap smear

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Introduction

Cervical cancer remains one of the top most common cancers among females worldwide. It is classified as the fourth most common cancer among women worldwide and the second commonest in developing countries with an estimation of 530,000 new cases in 2012 and more than 270,000 deaths every year (Who.int, 2015). In comparison, in developed countries such as US, cervical cancer has only an estimated number of 12,990 new cases and 4,120 deaths (Siegel et al. 2016). In 2010, the estimated Omani population was 1,933,591 with a sex ratio of 975 females per 1,000 males. Only 5.2% of the total population was above the age of 60 years. Cervical cancer was classified as the second most common cancer among women with a percentage of 7.7 of all cancers in Oman (Oman Cancer Registry, 2010).

The main cause of cervical cancer is unknown but infection with human papillomavirus (HPV), especially genotypes 16 and 18, is considered the main causative agent for cervical cancer (Guan et al., 2012). Other reported factors include genetic predisposition, cigarette smoking, women's sexual activity, oral contraceptives,

multiparity, dietary deficiencies and immunosuppression (Tran et al., 2015; Al-Shaikh et al., 2014).

Cervical cancer screening programmes such as Pap smear, visual inspection with acetic acid application and HPV screening test are established as the most effective approach to control cervical cancer. However, the uptake of those programmes in many developing countries, including Oman, is low. Lack of knowledge about cervical cancer and its screening programmes are the main barriers for high incidence of cervical cancer. Numerous studies have conducted in different countries to evaluate the awareness level of cervical cancer, contributing and risk factors, cervical screening test, the attitude towards it as well as the preventative practices. (Abudukadeer et al., 2015; Strohl et al., 2015; Yaninkem et al., 2013). In Oman, according to the best of our knowledge, no studies were conducted to estimate awareness levels. Therefore, this study aimed to assess the level of awareness about cervical cancer and cervical Pap smear and to establish a correlation between the knowledge and demographic factors among Omani women.

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Materials and Methods

Study design

This is a cross-sectional survey that was carried out from August 2015 to April 2016. Participants were recruited and divided into three categories. The first group composed of Omani women from any age group who attended Outpatient Gynecology Department in Sultan Qaboos University Hospital (SQUH), Oman. The second group contained Omani female staff from SQUH, College of Medicine and College of Nursing at Sultan Qaboos University (SQU). The participants of third group were graduating Omani female students at SQU.

Data Collection

This study was ethically approved by the Medical Research Committee and Ethics Committee from the College of Medicine and Health Sciences, SQU, Oman (MREC # 1139). Written consent was obtained. All participants were ensured about the confidentiality. They were informed that their participation is voluntary and they have full right to withdraw from the study at any time without reasons.

Data collection started through an interview-based questionnaire for the first category of participants, the gynecology outpatients, to assure their complete understanding of the asked questions and to ensure the validity of received responses. However, self-administered online copy of the questionnaire was prepared for participants of SQU staff and students as they have no time for interview.

The questionnaire that was used during data collection contained focused questions in respect to the overall knowledge of cervical cancer and Pap smear test. There were 11 questions assessing the knowledge of signs and symptoms of cervical cancer, nine questions about the risk factors and nine questions evaluating the awareness of Pap smear test (Al-Darwish et al., 2014; Ortashi et al., 2013). In addition, sources of information about cervical cancer were assessed. Questionnaire contains no personal identifying information.

Statistical analysis

The data were analyzed using Statistical Package for Social Science (SPSS) version 23 program (SPSS Inc., Chicago, IL, USA). For each question, the answer was coded as 1 for correct answer and 0 for incorrect or I do not know answer. The cumulative score of all the responses was calculated by summing correct answers to a total of 11 questions regarding the signs and symptoms, nine questions about the risk factors and nine questions about the Pap smear test separately. Then, a new variable was created to assess the overall knowledge by summing all the 29 questions with a higher score indicating a higher level of knowledge. If 2/3 or more of the total questions were answered correctly ($=$ or $>19/29$), the participant is considered as having adequate knowledge (Strohl et al., 2015).

The obtained results were displayed in cross tables and data were compared among the participants from the three categories. Moreover, knowledge levels were

compared to the educational and the marital status of the participants to remark possible correlations. Chi-square analysis was used to estimate the association between the categorized variables with P-values of 0.05 or less considered as significant.

Results

A total of 494 participated in this study. There were 204 gynecological outpatients, 133 SQU and SQUH female staff, and 157 SQU female students from all the nine colleges (Agricultural and Marine Sciences, Arts and Social Sciences, Economics and Political Science, Science, Nursing, Education, Law, Engineering and Medicine and Health Sciences). Initially, the participants were asked whether they had ever heard of cervical cancer. This was followed by 29 further questions to evaluate their level of knowledge about cervical cancer, HPV and Pap smear test. The results showed that 97.7%, 79.4% and 75.2% of staff, outpatients and students had heard of cervical cancer, respectively.

The vast majority of outpatients had chosen television as their main source of awareness with a percentage of 40.2%, whereas 35.8% responded that they knew about cervical cancer through internet, followed by hospital or clinic with a percentage of 34.8%. School or college was the most chosen source among both staff and students with percentages of 47.4% and 33.1%, respectively. The second main source among staff was hospital or clinic with a percentage of 42.1%, followed by internet with 26.3% which was the second main source of knowledge among students with 29.9%. Radio was the least picked source by the participants from all three groups, outpatients, staff and students, with percentages of 2.5%, 0.0% and 5.1%, respectively. The rest of participants said that they heard of cervical cancer by other means such as family, friends and prints (Table 1).

Outpatients and staff had adequate knowledge about the signs and symptoms of cervical cancer with 55.4% and 53.4%, respectively. Students were the least knowledgeable with a percentage of 21.7. Compared to signs and symptoms, knowledge of risk factors was much lower among all three categories with outpatients having slightly higher percentage than staff. Percentages of adequate knowledge were 35.8% among outpatients, 33.8% among staff and only 15.3% among students. The awareness of Pap smear was almost equal among

Table 1. Sources of Knowledge of Cervical Cancer Among SQUH Gynecological Outpatients, SQU Female Staff and Students

Source/ Category	Outpatients	Staff	Students
1. Hospital/ Clinic	34.8%	42.1%	14.0%
2. Friends/ Family	27.0%	14.3%	19.7%
3. Television	40.2%	14.3%	28.7%
4. Radio	2.5%	0.0%	5.1%
5. School/ college	11.3%	47.4%	33.1%
6. Internet	35.8%	26.3%	29.9%
7. Prints	33.8%	16.5%	23.6%

Table 2. Knowledge of Cervical Cancer's Signs, Symptoms and Risk Factors and Pap Smear Among SQUH Gynecological Outpatients, SQU Female Staff and Students

		Category			
		Outpatients	Staff	Students	Total
Knowledge of cervical cancer's signs and symptoms					
Adequate	n	113	71	34	218
	%	55.4	53.4	21.7	44.1
Inadequate	n	91	62	123a	276
	%	44.6	46.6	78.3	55.9
Knowledge of cervical cancer's risk factors					
Adequate	n	73	45	24	142
	%	35.8	33.8	15.3	28.7
Inadequate	n	131	88	133	352
	%	64.2	66.2	84.7	71.3
Knowledge of Pap smear					
Adequate	n	116	75	37	228
	%	56.9	56.4	23.6	46.2
Inadequate	n	88	58	120	266
	%	43.1	43.6	76.4	53.8

Adequate: $\geq 2/3$ of the total questions answered correctly

outpatients and staff with percentages of 56.9% and 56.4%, respectively. On the other hand, only 23.6% of students were aware of Pap smear (Table 2). After calculating the cumulative score for a total of 29 questions, the overall knowledge among outpatients, staff and students were 38.7%, 35.3% and 7.6%, respectively.

Among outpatients, the relationship between overall knowledge of cervical cancer and their highest educational qualification was significant with a P-value of 0.003. The majority of outpatients with medical university degree as well as postgraduates were found to be knowledgeable about cervical cancer and cervical Pap

smear with a percentage of 61.5% for each. In addition, 46.2% of outpatients with non-medical university degree were considered to have adequate knowledge. On the other hand, knowledge levels were much lower among outpatients with lower educational qualifications. The percentages of adequate knowledge were 16.7%, 0.0%, 21.4% and 28.8% among the illiterates, primary educated, preparatory educated and secondary educated outpatients, respectively. Staff were found to have educational qualifications ranging from undergraduate to postgraduate. The relationship of overall knowledge and educational level was insignificant with a P-value

Table 3. Association between Overall Knowledge of Cervical Cancer and the Educational Level of SQUH Gynecological Outpatients, SQU Female Staff and Students

		Participants' highest qualification								Total n %
		Illiterate	Primary education	Preparatory education	Secondary education	Under-graduate	Medical university degree	Non-medical university degree	Post-graduate	
Outpatients										
Adequate knowledge	n	1	0	3	17	0	8	42	8	79
	%	16.7%	0.0%	21.4%	28.8%	0.0%	61.5%	46.2%	61.5%	38.7
Inadequate knowledge	n	5	5	11	42	3	5	49	5	125
	%	83.3%	100.0%	78.6%	71.2%	100.0%	38.5%	53.8%	38.5%	61.3
Staff										
Adequate knowledge	n	0	0	0	0	15	16	1	15	47
	%	0.0%	0.0%	0.0%	0.0%	40.5%	32.7%	9.1%	41.7%	35.3
Inadequate knowledge	n	0	0	0	0	22	33	10	21	86
	%	0.0%	0.0%	0.0%	0.0%	59.5%	67.3%	90.9%	58.3%	64.7
Students										
Adequate knowledge	n	0	0	0	0	12	0	0	0	12
	%	0.0%	0.0%	0.0%	0.0%	7.6%	0.0%	0.0%	0.0%	7.6
Inadequate knowledge	n	0	0	0	0	145	0	0	0	145
	%	0.0%	0.0%	0.0%	0.0%	92.4%	0.0%	0.0%	0.0%	92.4

Adequate: $\geq 2/3$ of the total questions answered correctly

Table 4. Association between Overall Knowledge of Cervical Cancer and the Marital Status of SQUH Gynecological Outpatients, SQU Female Staff and Students

		Marital status		Total n %	p-Value	
		Single	Married			
Outpatients:						
Adequate knowledge	n	0	79	79	0.048	
	%	0.0	39.9	38.7		
Inadequate knowledge	n	6	119	125		
	%	100.0	60.1	61.3		
Staff:						
Adequate knowledge	n	25	22	47		0.056
	%	44.6	28.6	35.3		
Inadequate knowledge	n	31	55	86		
	%	55.4	71.4	64.7		
Students:						
Adequate knowledge	n	12	0	12	0.279	
	%	8.3	0.0	7.6		
Inadequate knowledge	n	132	13	145		
	%	91.7	100.0	92.4		

Adequate: $\geq 2/3$ of the total questions answered correctly

of 0.151. However, percentage of knowledge among postgraduates was the highest with 41.7% of them were considered as knowledgeable. Since 100% of the students were undergraduates, no P-value was displayed to test the significance of the relation between knowledge and educational levels. However, only 7.6% of them had adequate knowledge (Table 3).

Among outpatients, the relationship between overall knowledge of cervical cancer and their marital status was significant with a P-value of 0.048. 39.9% of the married outpatients were found to have adequate overall knowledge while the percentage was 0.0% among single women. On the other hand, the association between overall knowledge and the participants' marital status was insignificant among both staff and students with P-values of 0.056 and 0.279, respectively. The percentages of adequate knowledge were 44.6% among unmarried staff and 28.6% among married women, whereas only 8.3% of the unmarried students and none of the married students were found to have adequate knowledge (Table 4).

Discussion

This is the first study that measures the knowledge of cervical cancer's signs and symptoms, its predisposing factors and cervical Pap smear among Omani females. Although more than two-third of the participants from each of the three categories heard of cervical cancer, their specific knowledge as well as their overall knowledge was found to be considerably low. Similar findings were reported in a study conducted in Qatar about knowledge, attitude and practice regarding cervical cancer and screening among women visiting primary health care. Their study showed that more than 80% of the participants had heard of cervical cancer, whereas the actual knowledge was found to be much lower (Al-Meer et al., 2011). Regarding overall knowledge among staff, results

of this study do not fully agree with a study conducted among Ethiopian health care staff which concluded that overall knowledge regarding cervical cancer was relatively high although specific awareness of etiology and risk factors was low especially among nurses and midwives (Goedken et al., 2015). In the current study, the overall awareness among students is 7.6%. This finding is in line with other study which showed the knowledge level among female university graduates in Bhutan is poor (30.1%) (Dhendup and Tshering, 2014)

This study found that knowledge level among outpatients was slightly higher than that of staff. One of the possible explanations is that a reasonable number of outpatients, 120 out of 204, who took part in this study were of high educational level ranging from undergraduates to postgraduates including some outpatients with medical university degree. Moreover, only 23 (11.3%) of outpatients surveyed were in their first time visit to the Gynecology Department while the rest of them, 181 (88.7%), had visited the department at least two to six times previously. In addition, the third main source of knowledge among outpatients is the hospital (34.8%). The findings of this study disagreed with other similar study which conducted in Serbia to examine the difference in awareness levels among health care students (83.8%), midwives (35.3%) and women from the general population (22.7%) (Antic et al., 2014).

Moreover, the results of this study showed that there is a significant association between the educational qualification of outpatients and their knowledge level of cervical cancer and Pap smear, which was much greater among those with medical and non-medical university degrees as well as postgraduates. It is important to note that Pap smear is free of charge as it is funded by the Ministry of Health in Oman. Also, the education is free of charge in all schools from grade 1 to grade 12 as the Ministry of Education is responsible for all educational

system in Oman. Thus SQU students, who come from different schools, should have the same education. The findings of this study are inline with other studies. A study conducted in Jordan showed that knowledge of cervical cancer and Pap smear was inadequate among poorly educated women (Amarin et al., 2014). Similarly, other study stated that level of education was the only significant factor independently associated with inadequate knowledge of Pap smear test among Kuwaiti women (Al Sairafi and Mohamed, 2009). Similar findings were also reported (Abudukadeer et al., 2015; Al-Meer et al., 2011).

Although, findings of this study suggest that there is no significant association between the educational qualification and the staff's knowledge level, percentage of adequate knowledge was the highest among postgraduates. A possible interpretation is that the staff's main source of knowledge is from their college education, followed by hospital as their second main source. Therefore, most of them were aware of cervical cancer and Pap smear even during their medical study years or throughout their training and working years.

Regarding the relation between adequate overall knowledge of cervical cancer and Pap smear and the participants' marital status, results of this study showed that there is a significant association among outpatients with 100% of women who were considered to have adequate overall knowledge were married. This finding is in line with a previous study in Qatar which found that level of knowledge was higher among married women who visited primary health care and levels were even higher the longer the marriage (Al-Meer et al., 2011).

In contrast, the association between overall knowledge and marital status among staff was found to be insignificant since their knowledge of cervical cancer and Pap smear is mainly from their education and practice in the medical field. Similarly, there is no association between the awareness level and student' marital status since the vast majority of those how had adequate knowledge were from the College of Medicine and Health Science as well as College of Nursing. Therefore, their source of knowledge is mainly from their medical university education independently of their marital status.

Several limitations of our study are worth noting. First, the study was restricted to participants from a single hospital and university, even though this hospital serves as a tertiary referral hospital in Oman and the university is the national university of the Sultanate of Oman. Second, the exclusion of rural areas in this study. Thus, we cannot generalize the data to all Omani women. Third, students and staff were asked to fill online self-administered questionnaire instead of interview-based questionnaire, as with outpatients, which might bias the study.

Specific knowledge of cervical cancer, its risk factors and cervical Pap smear are poor among Omani women. This lack of knowledge may be one of the contributing factors for high incidence of cervical cancer in Oman compared to that in developed countries. Therefore, there is a significant need for the implementation of educational campaigns and programs directed towards women in the general population as well as healthcare workers as an attempt to improve awareness and enhance the attitude

towards cervical screening tests.

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