

RESEARCH ARTICLE

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Factors Influencing Knowledge and Practice Regarding Cervical Cancer and Pap smear Testing among Omani Women

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Abstract

Background: Knowledge of cervical cancer and performance of Pap smear testing are influenced by several sociodemographic factors. This study aimed to describe the effect of relevant variables on knowledge and compliance with guidelines in Oman. **Methods:** In this cross-sectional survey, participants were divided into three groups: patients who attended Outpatient Gynecology Department, female medical staff and university graduate students. **Results:** There were 204 outpatients, 133 staff, and 157 students. Adequate knowledge among was seen in 38.7%, 35.3%, and 7.6%, respectively. Knowledge of cervical cancer and Pap smear was significantly lower among outpatients with secondary education, while those with high level of income were more likely to have adequate cancer knowledge. Uptake of Pap smear was significantly greater among outpatients aged ≥ 30 years, with high income and a positive history of cancer. **Conclusion:** Culturally tailored interventions that focus on improving cancer risk knowledge are needed to maximize screening uptake for cervical cancer.

Keywords: Cervical cancer- Pap smear- knowledge- performance- sociodemographic factors

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Introduction

Cervical cancer is a leading cause of morbidity and mortality among gynecological cancers worldwide, with an estimated 528,000 newly diagnosed cases in 2012 and accounting for 7.5% of all female cancer mortality (Globocan., 2016). In Oman, it accounts for 6.3% of female cancers and ranked the third among all cancers (Nooyi and Al-Lawati., 2011). Infection with human papilloma virus (HPV), mainly 16 and 18 genotypes, is the main causative factor for cervical cancer with an estimated prevalence between 85-99% (de Sanjose et al., 2010). Other risk factors include multiparous (Goddy et al., 2015), genetic predisposition, cigarette smoking, women's sexual activity, oral contraceptives, dietary deficiencies, and immunosuppression (Tran et al., 2015; Wang et al., 2010).

Pap smear test has a great potential for early prevention of cervical cancer. In fact, Pap test and HPV vaccine have significantly reduced the mortality and morbidity of cervical cancer (Al-Shaikh et al., 2014; Al-Darwish et al., 2014; Huh, 2010). Nevertheless, Pap smear uptake among females is still suboptimal due to poor awareness about cervical cancer and its risk factors, lack of specific knowledge regarding the procedure, physician's negative attitude, embarrassment and fear of receiving an abnormal result (Obeidat et al., 2012; Rosser et al., 2015). Indeed there is a poor awareness of HPV infection and screening tests, lack of screening guidelines and vaccine availability

not only in general population but also among health professionals (Berraho et al., 2013). To the best of our knowledge, cancer risk knowledge and factors contributing to Pap smear uptake are less documented in the Middle Eastern region (Ortashi et al., 2013). Thus, this study aimed to identify and estimate the effect of contributing factors with regard to knowledge of cervical cancer and Pap smear uptake.

Materials and Methods

Study design

This cross-sectional survey was carried out from August 2015 to April 2016. Participants were Omani females from three subgroups: Outpatients from any age group who attended Outpatient Gynecology Department in Sultan Qaboos University Hospital (SQUH), staff from College of Medicine and Health Science and College of Nursing at Sultan Qaboos University (SQU), and graduating students from all the nine colleges at SQU including Agricultural and Marine Sciences, Arts and Social Sciences, Economics and Political Science, Science, Nursing, Education, Law, Engineering and Medicine and Health Sciences.

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

from all participants and they were ensured about the confidentiality and that their participation is voluntary and they have full right to withdraw from the study at any time without reasons. They were also rewarded for their time with an informative gift cards given at the end of the interview.

Data Collection

Data collection was interview-based for the gynecology outpatients and self-administered online for female staff and students. The questionnaire survey, which consists of four parts with a total of 44 questions, was designed by the investigators based on the study's objectives and literature review (Al-Darwish et al., 2014; Ortashi et al., 2013). However, some of the questions were modified based on expert opinions addressing the cultural values. Knowledge items regarding warning signs and risk factors of cervical cancer were extracted from Cancer Awareness Measure (CAM) tool kit version 2.1 and modified to fit Omani culture.

Data included age, marital status, educational level, family income, husband's educational level, family history of cancer, average visits to gynecology clinic, parity, and abortion. The parity were classified into multiparous (Para ≥ 4) and non-multiparous (Para < 4) according to the average number of children in Omani families. Family income (Omani Rial (OMR/Month) was divided into $\leq 1,000$ and $> 1,000$ based on Oman's average monthly household income that was reported by the National Center of Statistics and Information (NSCI) (Gulf Business., 2016). The awareness questions assessed whether or not participants had ever heard of cervical cancer, HPV, HPV vaccine and Pap smear testing, knowledge of warning signs and risk factors of cervical cancer, knowledge and performance of females regarding Pap smear testing.

For each question, the answer was coded as one for correct answer and zero for incorrect or (I do not know) answer. The total score represents the sum of the correct responses of the 29 questions. Knowledge of cervical cancer and Pap smear was categorized as "adequate" if approximately 2/3 (i.e. 19) of the 29 knowledge questions were correct. The cut-off point for knowledge adequacy was similar to other studies (Al-Shaikh et al., 2014; Jia et al., 2013).

Statistical analysis

Results of descriptive statistics were presented using Mean \pm SD for knowledge score and frequency (N) and percentages (%) for the remaining categorical variables. Bivariate analyses were performed using χ^2 to test the association between sociodemographic characteristics and knowledge of cervical cancer and Pap smear as well as its uptake reporting odds ratios (OR) and 95% confidence intervals (CI). P-values of less than 0.05 were considered statistically significant. The data were analyzed using Statistical Package for Social Science (SPSS) version 23 program.

Results

A total of 494 females participated in this study, 204 gynecological outpatients, 133 staff, and 157 students. Participants' characteristics were shown in Table 1. Most of participants were educated and had educational degrees. A total of 56.4% outpatients and 77.4% staff reported to have a total family income of more than 1,000 OMR per month, whereas 63.7% of participated students reported a family income of less than or equal to 1,000 OMR per month. Two-thirds of staff (92.5%) and students (72.6%) had not visited the clinic. Among the married females, 19.1% of the outpatients and 11.3% of staff were found to be multiparous (Para ≥ 4), while 8.3% of students were non-multiparous (Para < 4) Table 1.

Awareness and knowledge of cervical cancer and Pap smear

More than two-thirds of outpatients and students had heard of cervical cancer with less than one-third reported to have knowledge about HPV or HPV vaccine. Only 23.6% of students were aware of Pap smear testing in contrast to the high awareness among the outpatients (61.3%) and staff (85.7%) Table 2.

Bivariate analysis using χ^2 showed no association between average visits to the gynecology clinic and hearing of cervical cancer, HPV, HPV vaccine and Pap smear among all participants ($P > 0.05$). Only 45.1% of the outpatients and 22.9% of students knew correctly HPV infection as a risk factor for cervical cancer compared to 72.9% in staff. Using cutoff score of 19 out of 29 as an adequate knowledge score, 61.3% of the outpatients and 64.7% of staff were found to have inadequate knowledge regarding cervical cancer and Pap smear versus 92.4% in students Table 2.

Factors contributing to knowledge of cervical cancer and Pap smear

Among outpatients, marital status, educational level, and family income were associated significantly with adequate knowledge scores (P 's < 0.05) in contrast to age, family history of cancer, husband's educational level, parity, and abortion history ($P > 0.05$). Age, marital status, family income, family history of cancer, parity and abortion were not significantly associated with knowledge scores among staff. The same was true about the association of knowledge scores with marital status, family income, and family history of cancer among students Table 3.

A total of 36.8% and 23.3% of outpatients and staff had performed Pap smear, respectively, whereas none of students had a prior Pap smear. About 54% of postgraduates outpatients had performed Pap smear test versus 32.2% in females at secondary level of education and 33.3% in postgraduate staff Table 4.

Screening uptake increased with age among the outpatients (OR 1.86). Married females were four times more likely to perform Pap smear than unmarried females. Marital status was also a significant factor affecting the uptake of Pap smear test among staff. Husband's level of education was significantly correlated to Pap smear

Table 1. Characteristics of Outpatients, Staff, and Students

	Outpatients (n=204) N (%)	Staff (n=133) N (%)	Students (n=157) N (%)
Age (years)			
20 – 29	90 (44.1)	92 (69.2)	157 (100.0)
30 – 39	87 (42.7)	28 (21.1)	0 (0.0)
≥ 40	27 (13.2)	13 (9.6)	0 (0.0)
Marital status			
Single	6 (2.9)	56 (42.1)	144 (91.7)
Married	198 (97.1)	77 (57.9)	13 (8.3)
Education			
Below secondary education	25 (12.3)	0 (0.0)	0 (0.0)
Secondary education	59 (28.9)	0 (0.0)	0 (0.0)
Undergraduate	3 (1.5)	37 (27.8)	157 (100.0)
Bachelor	104 (51.0)	60 (45.1)	0 (0.0)
Postgraduate	13 (6.4)	36 (27.1)	0 (0.0)
Husband Education*			
Below secondary education	21 (10.6)	0 (0.0)	0 (0.0)
Secondary education	63 (31.8)	13 (16.9)	4 (30.8)
Undergraduate	1 (0.5)	4 (5.2)	0 (0.0)
Bachelor	92 (46.5)	41 (53.2)	8 (61.5)
Postgraduate	21 (10.6)	19 (24.7)	1 (7.7)
Family income (OMR/Month)			
≤ 1000 OMR/Month	89 (43.6)	30 (22.6)	100 (63.7)
> 1000 OMR/Month	115 (56.4)	103 (77.4)	57 (36.3)
Family history of cancer			
Negative	117 (57.4)	89 (61.7)	89 (61.7)
Positive	87 (42.6)	51 (38.3)	51 (38.3)
Reproductive history			
Average visits to gynecological clinic			
Did not visit the clinic	0 (0.0)	123 (92.5)	114 (72.6)
One visit	23 (11.3)	2 (1.5)	4 (2.5)
Multiple visits	181 (88.7)	8 (6.0)	39 (24.8)
Parity*			
Non-multiparous	159 (77.9)	62 (46.6)	13 (8.3)
Multiparous	39 (19.1)	15 (11.3)	0
Abortion*			
No	95 (46.6)	55 (41.4)	12 (7.6)
Yes	103 (50.5)	22 (16.5)	1 (0.6)

*Among married females. OMR: Omani Rial

uptake among outpatients. Outpatients who had high family income (OR 1.80) and a positive family history of cancer (OR 1.99) were more likely to perform Pap smear. While husband's level of education, income more than 1,000 OMR/Month, and a positive family history of cancer were not significantly influenced the practice of Pap smear among staff Table 5.

Discussion

Several studies suggested that adequate knowledge

of cervical cancer and performance of Pap smear were influenced by several sociodemographic factors such as age, participants educational level, husband's qualification and family income (Strohl et al., 2015; Al-Shaikh et al., 2014; Al-Darwish et al., 2013; Jia et al., 2013; Obeidat et al., 2012). The findings of this study show an inadequate knowledge of Omani females with regard to cervical cancer warning signs and risk factors as well as Pap smear test. These findings are consistent with similar studies conducted on outpatients females (Barghouti et al., 2008), medical staff, e.g., nurses, doctors, and medical students

Table 2. Awareness and Knowledge of Cervical Cancer and Pap among Participants

	Outpatients (n=204) N (%)	Outpatients (n=204) N (%)	Students (n=157) N (%)
Awareness			
Heard of cervical cancer	162 (79.4)	130 (97.7)	118 (75.2)
Heard of HPV	20 (9.8)	103 (77.4)	33 (21.0)
Heard of HPV vaccine	12 (5.9)	79 (59.4)	23 (14.6)
Heard of Pap smear	125 (61.3)	114 (85.7)	37 (23.6)
Early Signs and symptoms			
Vaginal bleeding between periods	132 (64.7)	86 (64.7)	67 (42.7)
Persistent lower back pain	82 (40.2)	62 (46.6)	43 (27.4)
Persistent vaginal discharge with unpleasant smell	125 (61.3)	74 (55.6)	39 (24.8)
Discomfort or pain during sex	121 (59.3)	84 (63.2)	40 (25.5)
Menstrual periods that are longer or heavier than usual	127 (62.3)	59 (44.4)	38 (24.2)
Persistent diarrhea	118 (57.8)	88 (66.2)	65 (41.4)
Vaginal bleeding after menopause	164 (80.4)	95 (71.4)	76 (48.4)
Persistent pelvic pain	129 (63.2)	85 (63.9)	64 (40.8)
Vaginal bleeding during or after sex	127 (62.3)	83 (62.4)	49 (31.2)
Blood in stool or urine	72 (35.3)	21 (15.8)	44 (28.0)
Unexplained weight loss	116 (56.9)	85 (63.9)	45 (28.7)
Risk factors			
Infection with human papilloma virus	92 (45.1)	97 (72.9)	36 (22.9)
Smoking	125 (61.3)	82 (61.7)	50 (31.8)
Immunocompromised	177 (86.8)	94 (70.7)	72 (45.9)
Immunocompromised husband	100 (49.0)	37 (27.8)	31 (19.7)
Long term use of the oral contraceptive	121 (59.3)	57 (42.9)	57 (36.3)
Early marriage (before 17 years)	30 (14.7)	35 (56.3)	24 (15.3)
Multiparous (Para 4 and above)	26 (12.7)	22 (16.5)	19 (12.1)
Family history of cervical cancer	147 (72.1)	108 (81.2)	70 (44.6)
Not performing regular screening tests	159 (77.9)	78 (58.6)	51 (32.5)
Pap smear			
What is the best frequency of Pap smear?	35 (17.2)	55 (41.4)	18 (11.5)
Is Pap smear required only for married females?	149 (73.0)	82 (61.47)	100 (63.7)
Is Pap smear not required for females who have reached menopause?	179 (87.7)	94 (70.7)	54 (34.4)
What does it mean if you have an abnormal Pap smear?	65 (31.9)	65 (48.9)	33 (21.0)
After an abnormal Pap smear result:			
Is blood test required?	16 (7.8)	27 (20.3)	17 (10.8)
Is it needed to do another Pap smear?	193 (94.6)	100 (75.2)	101 (64.3)
Is HPV test required?	143 (70.1)	108 (81.2)	93 (59.2)
Is colposcopy needed?	172 (84.3)	84 (63.2)	85 (54.1)
Is biopsy needed?	190 (93.1)	108 (81.2)	76 (49.4)
Average knowledge score	16.8 ± 4.1	16.2 ± 5.6	16.2 ± 5.6
Adequate knowledge	79 (38.7)	47 (35.3)	47 (35.3)
Inadequate knowledge	125 (61.3)	86 (64.7)	86 (64.7)

(Mutuyaba et al., 2006, Al-Shaikh et al., 2014).

We also found that there was a lack of knowledge about warning signs and risk factors of cervical cancer among outpatients and students. As such, more than half of females did not know HPV infection as a risk

factor which could be explained by poor knowledge about HPV infection and HPV vaccine especially in Gulf countries (Al-Darwish et al., 2014; Ortashi et al., 2013). In contrast, high awareness about HPV and its vaccine was found in other Islamic countries like Turkey

Table 3. Factors Contributing to Knowledge of Cervical Cancer and Pap Smear

Characteristics	Outpatients (n=204)			Staff (n=133)			Students (n=157)		
	Inadequate knowledge	Adequate knowledge	OR	Inadequate knowledge	Adequate knowledge	OR	Inadequate knowledge	Adequate knowledge	OR
	N (%)	N (%)		N (%)	N (%)		N (%)	N (%)	
Age (years)									
< 30 ²	56 (62.2)	34 (37.8)	1	55 (59.8)	37 (40.2)	1	145 (92.4)	12 (7.6)	3
≥ 30	69 (60.5)	45 (39.5)	1.07	31 (75.6)	10 (24.4)	0.48	0 (0.0)	0 (0.0)	
P value	0.805			0.078			3		
Marital status									
Single ²	6 (100.0)	0 (0.0)		31 (55.4)	25 (44.6)	1	132 (91.7)	12 (8.3)	3
Married	119 (60.1)	79 (39.9)	3	55 (71.4)	22 (28.6)	0.49	13 (100.0)	0 (0.0)	
P value	0.001			0.308			3		
Education									
Below sec educat	21 (84.0)	4 (16.0)	0.12	0 (0.0)	0 (0.0)	3	0 (0.0)	0 (0.0)	
Secondary educat	42 (71.2)	17 (28.8)	0.25	0 (0.0)	0 (0.0)	3	0 (0.0)	0 (0.0)	
Undergraduate	3 (100.0)	0 (0.0)	3	22 (59.5)	15 (40.5)	0.96	145 (92.4)	12 (7.6)	
Bachelor	54 (51.9)	50 (48.1)	0.58	43 (71.7)	17 (28.3)	0.55	0 (0.0)	0 (0.0)	
Postgraduate ²	5 (38.5)	8 (61.5)	1	21 (58.3)	15 (41.7)	1	0 (0.0)	0 (0.0)	
P value	0.001			0.308			3		
Husband Educa ¹									
Below sec educat	17 (81.0)	4 (19.0)	0.38	0 (0.0)	0 (0.0)	3	0 (0.0)	0 (0.0)	3
Secondary educat	40 (63.5)	23 (36.5)	0.93	9 (69.2)	4 (30.8)	0.61	4 (100.0)	0 (0.0)	
Undergraduate	1 (100.0)	0 (0.0)	3	2 (50.0)	2 (50.0)	1.38	0 (0.0)	0 (0.0)	
Bachelor	48 (52.2)	44 (47.8)	1.49	33 (80.5)	8 (19.5)	0.33	8 (100.0)	0 (0.0)	
Postgraduate ²	13 (61.9)	8 (38.1)	1	11 (57.9)	8 (42.1)	1	1 (100.0)	0 (0.0)	
P value	0.125			0.232			3		
Family income (OMR/Month)									
≤ 1000 ²	67 (75.3)	22 (24.7)	1	21 (70.0)	9 (30.0)	1	95 (95.0)	5 (5.0)	1
> 1000	58 (50.4)	57 (49.6)	2.99	65 (63.1)	38 (36.9)	1.36	50 (87.7)	7 (12.3)	2.66
P value	< 0.001			0.487			0.099		
Family history of cancer									
Negative ²	74 (63.2)	43 (36.8)	1	52 (63.4)	30 (36.6)	1	101 (91.8)	9 (8.2)	1
Positive	51 (58.6)	36 (41.4)	1.22	34 (66.7)	17 (33.3)	0.86	44 (93.6)	3 (6.4)	0.77
P value	0.502			0.703			0.698		
Parity ¹									
Non-multiparous ²	93 (58.5)	66 (41.5)	1	44 (71.0)	18 (29.0)	1	0 (0.0)	0 (0.0)	3
Multiparous	26 (66.7)	13 (33.3)	0.71	11 (73.3)	4 (26.7)	0.88	0 (0.0)	13 (100.0)	
P value	0.350			0.856			3		
Abortion ¹									
No ²	59 (62.1)	36 (37.9)	1	38 (69.1)	17 (30.9)	1	0 (0.0)	12 (100.0)	3
Yes	60 (58.3)	43 (41.7)	1.18	17 (77.3)	5 (22.7)	0.66	0 (0.0)	1 (100.0)	
P value	0.580			0.473			3		

¹ Only among married females, ² Reference category, ³ P-value, OR and 95% CI cannot be calculated OMR: Omani Rial, se: secondary, educat: education, OR: Odds ratios

(45.0 – 46.0%) (Dursun et al., 2009) and non-Islamic countries like Belgium (50.0%) (Donders et al., 2008). This might be due to conservative society in Gulf countries and lack of public program for sexual and reproductive education. It was observed that countries that provide good sexual and reproductive education program like Australia showed high levels of knowledge (80.0-90.0%) (Giles and Garland., 2006). We found that knowledge of HPV as etiological factor of cervical cancer was high

among our medical staff (72.9%), in contrast to data from Jordan which showed almost half of health professionals did not know about HPV infection as a risk factor (Obeidat et al., 2012).

We assessed the influence of some independent variables on knowledge level of cervical cancer and Pap smear. Educational level and family income were significant independent predictors of knowledge level among outpatients, comparable to previous studies

Table 4. Factors Contributing to Knowledge of Pap smear

Characteristics	Outpatients (n=204)		Staff (n=133)		Students (n=157)	
	Performed	Not Performed	Performed	Not Performed	Performed	Not Performed
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Age (years)						
< 30 ²	26 (28.9)	64 (71.1)	18 (19.6)	74 (80.4)	0 (0.0)	157 (100.0)
≥ 30	49 (43.0)	65 (57.0)	13 (31.7)	28 (68.3)	0 (0.0)	0 (0.0)
P value	0.038		0.126		3	
Marital status						
Single ²	0 (0.0)	6 (100.0)	6 (10.7)	50 (89.3)	0 (0.0)	144 (100.0)
Married	75 (37.9)	123 (62.1)	25 (32.5)	52 (67.5)	0 (0.0)	13 (100.0)
P value	0.050		0.003		3	
Education						
Below sec educat	10 (40.0)	15 (60.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Secondary educat	19 (32.2)	40 (67.8)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Undergraduate	0 (0.0)	3 (100.0)	5 (13.5)	32 (86.5)	0 (0.0)	157 (0.0)
Bachelor	39 (37.5)	65 (62.5)	14 (23.3)	46 (76.7)	0 (0.0)	0 (0.0)
Postgraduate ²	7 (53.8)	6 (46.2)	12 (33.3)	24 (66.7)	0 (0.0)	0 (0.0)
P value	0.401		0.135		3	
Husband Educa¹						
Below sec educat	7 (33.3)	14 (66.7)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Secondary educat	21 (33.3)	42 (66.7)	3 (23.1)	10 (76.9)	0 (0.0)	4 (100.0)
Undergraduate	0 (0.0)	1 (100.0)	3 (75.0)	1 (25.0)	0 (0.0)	0 (0.0)
Bachelor	33 (35.9)	59 (64.1)	10 (24.4)	31 (75.6)	0 (0.0)	8 (100.0)
Postgraduate ²	14 (66.7)	7 (33.3)	9 (47.4)	10 (52.6)	0 (0.0)	1 (100.0)
P value	0.062		0.083		3	
Family income (OMR/Month)						
≤ 1000 ²	26 (29.2)	63 (70.8)	0 (0.0)	30 (100.0)	0 (0.0)	100 (100.0)
> 1000	49 (42.6)	66 (57.4)	31 (30.1)	72 (69.9)	0 (0.0)	57 (100.0)
P value	0.049		0.001		3	
Family history of cancer						
Negative ²	35 (29.9)	82 (70.1)	21 (25.6)	61 (74.4)	0 (0.0)	110 (100.0)
Positive	40 (46.0)	47 (54.0)	10 (19.6)	41 (80.4)	0 (0.0)	47 (100.0)
P value	0.019		0.426		3	
Parity¹						
Non-multiparous ²	56 (35.2)	103 (64.8)	20 (32.3)	42 (67.7)	0 (0.0)	13 (100.0)
Multiparous	19 (48.7)	20 (51.3)	5 (33.3)	10 (66.7)	0 (0.0)	0 (0.0)
P value	0.119		0.936		3	
Abortion¹						
No ²	30 (31.6)	65 (68.4)	8 (36.4)	38 (69.1)	0 (0.0)	12 (100.0)
Yes	45 (43.7)	58 (56.3)	17 (30.9)	14 (63.6)	0 (0.0)	1 (100.0)
P value	0.079		0.644		3	

¹ Only among married females, ² Reference category, ³ P-value, OR and 95% CI cannot be calculated OMR: Omani Rial, se: secondary, educat: education

(Barghouti et al., 2008; Al Sairafi and Mohamed, 2009; Al-Meer et al., 2011). Also, outpatients with higher family income had better cancer knowledge scores as confirmed by other series (Strohl et al., 2015). High level of income might have influenced cancer knowledge level directly and indirectly by providing more chances for receiving better education and highly standard healthcare where health professionals have more time to raise the knowledge level regarding important health issues.

It is noteworthy that, educational level and family income of medical staff did not influence their level of

knowledge. This finding is in line with other similar studies (Obeidat et al., 2012; Mutyaba et al., 2006). Health care providers and all of the medical staff are expected to be adequately knowledgeable about all the aspects related to cervical cancer and Pap smear because they play an active role in the provision of appropriate information about the warning signs, risk factors and importance of screening test to their patients and the public.

Most of students had inadequately knowledge about cervical cancer and screening. Similar finding was found in a study conducted on medical students in Saudi Arabia

Table 5. Factors Associated with Uptake of Pap smear among Outpatients and Staff

	Outpatients (n=204) OR (95%CI)	Staff (n=133) OR (95%CI)
Age		
< 30yrs ¹	1	1
≥ 30yrs	1.86 (1.03 - 3.34)	1.91 (0.83 - 4.40)
Marital status		
Single ¹	1	1
Married	0.95 (0.92 - 0.99)	4.00 (1.52 - 10.59)
Education		
Below secondary education	0.57 (0.15 - 2.21)	-2
Secondary education	0.41 (0.12 - 1.38)	-2
Undergraduate	-2	0.31 (0.10 - 1.01)
Bachelor	0.51 (0.16 - 1.64)	0.61 (0.24 - 1.5)
Postgraduate ¹	1	1
Husband Education		
Below secondary education	0.25 (0.07 - 0.90)	-2
Secondary education	0.25 (0.09 - 0.71)	0.33 (0.07 - 1.61)
Undergraduate	-2	3.33 (0.29 - 38.09)
Bachelor	0.28 (0.10 - 0.76)	0.36 (0.11 - 1.13)
Postgraduate ¹	1	1
Family income (OMR/Month)		
≤ 1000 ¹	1	-2
> 1000	1.80 (1.11 - 3.24)	
Family history of cancer		
Negative ¹	1	1
Positive	1.99 (1.12 - 3.56)	0.71 (.30 - 1.66)
Parity		
Non-multiparous ¹	1	1
Multiparous	1.75 (0.86 - 3.54)	1.05 (0.32 - 3.48)
Abortion		
No ¹	1	1
Yes	1.68 (0.94 - 3.01)	1.28 (0.45 - 3.61)
Knowledge level of cervical cancer and Pap smear		
Inadequate ¹	1	1
Adequate	1.55 (0.87 - 2.77)	1.01 (0.44 - 2.34)

¹Reference category, ²OR cannot be calculated, OMR: Omani Rial, OR: Odds ratios.

(Al-Shaikh et al., 2014). Our data suggests that this subgroup as a future new generation needs to be highly educated about important health issues and screening programs.

Marital status influenced significantly the level of knowledge among outpatients. This result was similar to a study conducted in Michigan (Holcomb et al., 2004). However, age and husband education were not associated with the knowledge score among females participated in the study, consistent with other similar study (Su., 2011). In addition, the findings of this study show that parity and abortion were not associated with knowledge scores among the outpatients, staff and students, in disagreement with other studies (Al-Meer et al., 2011; Su, 2011).

Among outpatients, 36.8% had undergone a Pap smear test. This, in consistent with other studies, suggests a low uptake among females possibly due to lack of national preventive health-screening program,

lack of encouragement by health professionals (Barghouti et al., 2008; Al-Meer at al., 2011; Ranabhat et al., 2014) as only 32.4% of females were recommended by health professionals to do Pap smear. In contrary, in Jordan, most of the Pap smear testing among female outpatients was encouraged by health providers (Obeidat et al., 2012).

Outpatients were more likely to perform Pap smear if they were older than 30 years, had a family income > 1,000 OMR/Month, and had a positive family history of cancer. This finding is in line with other similar studies (Barghouti et al., 2008; Al-Meer at al., 2011). This might be due to more access to health care facilities and performing regular check-ups.

As such, female outpatients who are married to a husband with secondary education or below were less likely to perform Pap smear. Although this finding is in disagreement other study (Su, 2011), education is considered as an important predictor of performance and

knowledge of Pap smear (Barghouti et al., 2008; Su, 2011).

Married female staff were more likely to perform Pap smear test than single females. This would be explained that married females are more likely to have multiple visits to gynecology clinic for their contraceptive and obstetric consultation. Unlike other study conducted among nurses (Tay et al., 2015), the present study showed that husband education is not an influencing factor on the practice of Pap smear among female staff. While, many of the demographic factors such as age, family income, family history of cancer, parity, and abortion were found to correlate positively with uptake of Pap smear test among the medical staff in previous study (Ackerson and Gretebeck, 2007), this correlation was not recorded in the present study.

In conclusion, the findings of this study showed inadequate knowledge of cervical cancer and poor uptake of Pap smear test among outpatients, staff, and medical students. As a recommendation, culturally appropriate educational health programs and interventions that focus on improving the level of knowledge are needed to maximize screening uptake with Pap smear testing.

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