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ORIGINAL ARTICLE

Awareness and practices related to cervical cancer among women in Jeddah, Saudi Arabia: cross-sectional questionnaire-based study

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ABSTRACT

Objective: This study aimed to assess the awareness and practices related to cervical cancer (CC) among women in Jeddah, Saudi Arabia, to improve awareness and preventive strategies.

Methods: The study was a cross-sectional design to collect data from 513 women in Jeddah. Convenience sampling was used for data collection, with questionnaires distributed online via social media.

Results: The results showed that 426 females (83%) had poor awareness of CC. However, 87 females (17%) had good awareness. Furthermore, 93.9% of participants correctly identified vaginal bleeding as a symptom of CC, while more than half recognized pain during urination (57.2%) and dyspareunia (61.1%) as significant symptoms. Regarding risk factors, 61.4% mentioned family history, and 58.7% cited sexually transmitted viruses. For screening, 73.5% were aware of the Pap smear test, but only 24.1% knew the correct annual frequency, and 22.8% recognized the 3-year interval. Awareness of the human papillomavirus (HPV) vaccine was at 53.0%, with a low uptake of 6.6%. Age and marital status showed statistically significant differences in CC awareness (p-value < 0.05).

Conclusion: This study revealed significant awareness gaps regarding CC symptoms, risk factors, and preventive measures among women in Jeddah, Saudi Arabia. Awareness levels were significantly influenced by socio-demographic factors like age and employment status. Public health education campaigns are crucial to improve awareness and promote preventive measures such as HPV vaccination and Pap smear tests.

Keywords: Cervical cancer, awareness, HPV, vaccination.

Introduction

Cervical cancer (CC), the fourth most common among females, is a type of cancer that occurs in the cells of the cervix and is the second leading cause of death in women of reproductive age [1]. According to the World Health Organization, there were about 600,000 new cases of CC in 2022 globally, with about 350,000 deaths being recorded in the same year [2].

In Saudi Arabia, the crude incidence rate per 100,000 women in 2020 was 2.4, with a cancer mortality-to-incidence ratio of 0.5 [3]. The human papillomavirus (HPV) is the most common risk factor for CC, with HPV-16 and HPV-18 being the most common viruses [4]. Other major CC risk factors include smoking, early age of onset of sexual activity, and prolonged use of birth control contraceptives.

Despite its deadly nature, CC is also one of the most preventable cancers, with most cases occurring in women

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who had not been screened [5]. The availability of pap smear screening tests has greatly reduced the incidence and mortality rates of CC. The importance of screening for CC is highlighted by the fact that most patients do not experience symptoms until the disease reaches its advanced stage [6]. Therefore, knowledge, attitude, and practices related to CC are critical to the management of the disease. Adequate knowledge of the disease enhances the ability to take preventive measures, such as vaccination, safe sexual activity, and screening [7].

In Saudi Arabia, the Ministry of Health has established HPV screening guidelines and has run several awareness campaigns. However, screening rates remained significantly low in Saudi Arabia. Alkhamis et al. [3] determined that the prevalence of CC screening among Saudi females was 22.1%, with the common reason for failure to undergo CC screening is that it is "never recommended by a physician".

Given that CC-related morbidities and mortalities are highly preventable, it is important to explore the degree to which women in Saudi Arabia know about the disease. Existing research established a strong linkage between knowledge of CC and reduced incidence and mortality rates [8]. Knowledge of the disease would include such things as being aware of the nature of the disease, its risk factors, preventive measures, and so on. This study aimed to assess the awareness and practices related to CC among women in Jeddah, Saudi Arabia. This study would be crucial for enhancing better awareness campaigns and creating approved strategies for dealing with the disease.

Subjects and Methods

A cross-sectional study was conducted to evaluate awareness and practices related to CC among women in Jeddah City, Saudi Arabia. The study focused on adult women aged between 18 and 55 years who resided in Jeddah.

The study included females aged between 18 and 55 years residing in Jeddah. Only Saudi nationals were considered for inclusion. Exclusion criteria encompassed males, individuals under 18 years of age, non-Saudi nationals, those not residing in Jeddah, and individuals who did not give consent. Additionally, participants were excluded if they were unable to comprehend or respond to the survey due to cognitive impairments or language barriers, if they submitted duplicate responses, or if their surveys had significant missing data that would affect the analysis.

Cochrane sample size formula was employed to ascertain the sample size. The formula used was; $n = Z^2p\ (1 - p)/d^2$. Where n represented the sample size, Z denoted the critical for 95% CI, 50% was the predetermined proportion, and d was the margin of error (5%). The initial calculation yielded a minimum acceptable sample size of 384. However, to enhance the reliability of the results, a slightly larger sample size of 513 participants was selected. The participants were enrolled by convivence sampling technique.

Data for this study were collected using an online self-reported questionnaire adapted from a previous study conducted in Al-Madinah Al-Munawwarah [9]. The questionnaire was provided in English and Arabic language, and it was distributed through multiple social media applications (WhatsApp and Twitter). The first section of the questionnaire was composed of social demographic variables, and the second section of the questionnaire, comprised of 20 items, assessed CC awareness, scoring each response to create a continuous variable ranging from 0 to 20 points. Items covered symptoms, risk factors, knowledge of HPV and Pap smear tests, and frequency and benefits of screening, awarding points for correct responses and zero for incorrect ones. The final section of the questionnaire assessed practices related to CC screening and prevention with two items: whether participants had performed a Pap smear test and whether they had received the HPV vaccine, with responses coded as "yes" (1) and "no" (0).

The questionnaire was translated from the English language to Arabic by a forward-backward translation approach. The translation was conducted by two language experts, who translated the questions into Arabic, and then the back-translation into English was conducted by another two independent language experts. To ensure face and content validity, the questions were revised by two experts in public health who revised the questionnaire to confirm coverage of the question of study objectives and understandability of the questions. The required changes were made.

Data were extracted, reviewed, cleaned, coded, and entered into IBM's Statistical Package for Social Sciences software version 28 for statistical analysis. All statistical tests were two-tailed, with a significance level set at a p-value of less than 0.05. To assess participants' awareness of CC, an overall score was computed by summing the points from specific questions (1-9, 11, 13, 14) that measured awareness. Each correct response received one point, while incorrect responses or answers of "No" or "I don't know" were scored as zero. Participants scoring below 60% of the maximum possible score were categorized as having poor awareness, whereas those scoring 60% or higher were classified as having good awareness. Descriptive statistics were presented through frequency and percentage distributions for all variables, including demographic data and information on CC symptoms, risk factors, screening, and vaccination. Additionally, cross-tabulation, Pearson's chi-square test, and exact probability tests were utilized to analyze the data. Statistical significance was determined with a threshold p-value of less than 0.05.

Results

The study included 513 female participants. Among them, the largest group was aged 18-24 years, comprising

271 individuals (52.8%). Regarding marital status, 309 participants (60.2%) were single. When considering educational status, the majority (n = 414, 80.7%) had completed a university education. Employment status revealed that 409 (79.7%) of participants were unemployed. Additionally, the duration of marriage showed that 309 (60.2%) participants were not married, while 162 (31.6%) had been married for 7 years or more (Table 1).

Vaginal bleeding was reported by a significant majority, with 476 participants (93.9%) recognizing it as a potential symptom. Pain during urination was acknowledged by 290 participants (57.2%), indicating a moderate level of awareness. Similarly, 310 participants (61.1%) identified dyspareunia, or pain during sexual intercourse, as a symptom of CC. Bacterial transmission through sexual contact was acknowledged by 185 participants (36.1%), while 219 participants (42.7%) identified long-term use of contraceptives as a potential risk factor. Multiple births were recognized as a risk factor by 51 participants (9.9%), and smoking was identified by 136 participants (26.5%) (Table 2).

The majority of the participants, 303 (59.1%) had HPV. In terms of the Pap Smear test, 377 participants (73.5%) had heard of the test. Among those who were aware of the Pap Smear test, 347 participants (92.0%) correctly identified it as a screening test for CC. Additionally, the majority of participants (n = 315, 83.6%) believed that Pap Smear tests could be conducted in hospitals. Regarding the benefits of early screening, 343 participants (69.9%) correctly identified that it aids in the treatment, prevention, and detection of cancer before noticeable signs and symptoms occur when asked if they had undergone a Pap Smear test, 81 participants (15.8%) responded affirmatively. Reasons for not taking the test included being too shy or uncomfortable (41, 9.5%) (Table 3).

The results indicated varying levels of awareness and knowledge regarding the HPV vaccine. Approximately, 53% of participants were aware of the HPV vaccine. Among those who were aware, the main sources of information were social media, awareness campaigns, and doctors. In terms of vaccine uptake, the majority of participants (93.4%) in the survey had not received the HPV vaccine. Among those who had not taken the vaccine, various reasons were cited. A significant portion (48.9%) expressed a willingness to receive the vaccine, indicating a positive attitude towards vaccination. However, concerns about potential side effects and a lack of awareness about them were voiced by 11.3% of participants (Table 4).

Table 1. *Social demographic variables of the respondents (n = 513).*

Sociodemographic data	Category	Frequency (*N*)	Percentage (%)
Age groups (years)	18-24	271	52.80
	25-34	84	16.40
	35-44	80	15.60
	45-55	63	12.30
	More than 55	15	2.90
Marital status	Single	309	60.20
	Married	176	34.30
	Divorced	18	3.50
	Widow	10	1.90
Educational status	Illiterate	1	0.20
	Primary	5	1.00
	Intermediate	6	1.20
	High School	87	17.00
	University	414	80.70
Employment status	Employed	96	18.70
	Unemployed	409	79.70
	Retired	8	1.60
	Not married	309	60.20
Duration of marriage	1-2 Years	21	4.10
	3-4 Years	15	2.90
	5-6 Years	6	1.20
	7 years or more	162	31.60

Table 2. *Awareness of CC symptoms and risk factors (n = 513).*

CC symptoms and risk factors	Category	Frequency (*N*)	Percentage (%)
Symptoms	Vaginal bleeding	476	93.90
	pains during urination	290	57.20
	Dyspareunia	310	61.10
	Leg pain	101	19.90
	Headache	36	7.10
	Dyspnea	36	7.10
Risk factors	Family history	315	61.40
	Virus transmitted sexually	301	58.70
	Bacteria transmitted	185	36.10
	Long-term uses of contraceptive	219	42.70
	Multiple births	51	9.90
	Smoking	136	26.50

Participants could choose more than one answer.

Table 3. *Awareness and practices of CC screening (n = 513).*

Awareness and practices of CC screening questions	Category	Frequency (*N*)	Percentage (%)
Have you heard of the Human Papilloma Virus?	No	210	40.90
	Yes	303	59.10
Have you heard of (the "Pap Smear") test?"	No	136	26.50
	Yes	377	73.50
If yes, what is the Pap Smear test?	Test for identifying CC	347	92.00
	Test for detecting pregnancy	5	1.30
	I don't know	25	6.60
Frequency of the Pap Smear to be executed?	Every 6 months	70	18.60
	Every 1 year	91	24.10
	Every 3 year	86	22.80
	I don't know	130	34.50
Where can we perform a Pap Smear test?	Conducted by participants	13	3.40
	Hospitals	315	83.60
	Primary care centers	70	18.60
	I don't know	33	8.80
Which of the following are the benefits of performing early screening for CC?	Treatment will be more straightforward	180	36.70
	Cancer signs and symptoms may not be easily noticeable	102	20.80
	For preventing cancer	151	30.80
	All of the above	343	69.90
	I don't know	6	1.20
Have you done Pap Smear test?	No	432	84.20
	Yes	81	15.80
If no, what are the reasons for not taking Pap Smear test?	Too shy or uncomfortable to undergo it	41	9.50
	Uncertain about where to get it done	45	10.40
	Unable to take the test due to never having been married	131	30.30
	Unaware of its importance	128	29.60
	Other reasons	87	20.10

Table 4. *Awareness and practices related to HPV vaccination (n = 513).*

Awareness and practices related to HPV vaccination questions	Category	Frequency (*N*)	Percentage (%)
Have you heard of the HPV vaccine?	No	241	47.00
	Yes	272	53.00
If yes, what is the main source of your information?	Social media	121	44.50
	Awareness campaign	98	36.00
	Doctor	87	32.00
	Other sources	52	19.10
What is the appropriate age to receive the HPV vaccine?	25 years or less	119	43.80
	More than 25 years	98	36.00
	I don't know	55	20.20
Have you received HPV vaccine?	No	479	93.40
	Yes	34	6.60
If you have not taken Vaccine, do you mind take it? If not - Why?	I don't mind	234	48.90
	I mind, concerned and unaware of its	54	11.30
	I mind, need to know more about it	151	31.50
	I mind, only if I	26	5.40
	Not married	14	2.90

HPV, human papilloma virus.

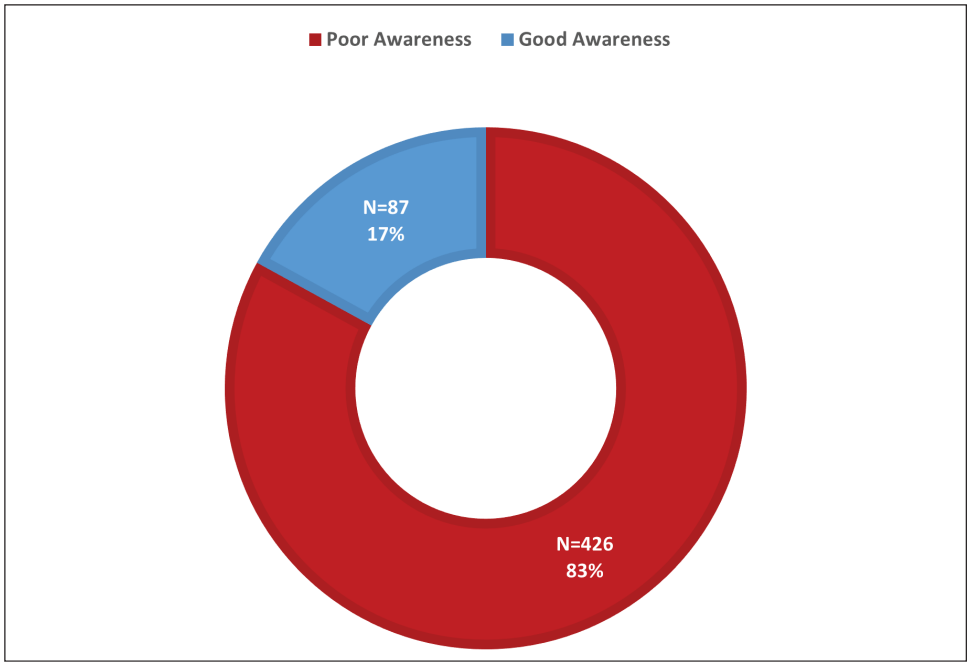

Figure 1. *Pie chart depicting the awareness level of the participants.*

Results showed that 426 females (83%) had poor awareness of CC (Figure 1).

Results revealed that there was a significant association between age and awareness level (p-value = 0.007). The percentage of individuals with poor awareness levels was higher in the 18-24 years age group (54.5%), compared to the participants with good awareness levels (44.8%). Although there was no significant association between marital status and awareness level (p-value = 0.485), it was worth noting that single individuals had poor awareness levels (61.3%), while married individuals had better awareness levels (41.4%). There was no significant association between educational status and awareness level (p-value = 0.416); however, a significant association was found between employment status and awareness level of CC (p-value = 0.007). Employed individuals had

a good awareness level (29.9%), while the unemployed had a poor awareness level (81.7%) (Table 5).

Discussion

CC remains a significant public health concern globally, exacerbated by low awareness levels and inadequate screening practices among women [10]. This study aimed to assess the awareness levels of CC among the general population of Jeddah, Saudi Arabia. Among the surveyed women, an overwhelming majority (93.9%) correctly identified vaginal bleeding as a symptom of CC. Most women recognized family history (61.4%) and sexually transmitted viruses (58.7%) as major risk factors for CC. However, only about half of the participants identified long-term use of contraceptives (42.7%) and bacterial infections (36.1%) as risk factors. These findings indicated a significantly higher level of awareness compared to a study conducted among 490 Omani women, where only 68.9% were aware that vaginal bleeding was a main symptom, and just 28.5% were aware of its risk factors [11]. In comparison, another study conducted in the Al Madinah Province of Saudi Arabia found that the majority of participants mentioned vaginal bleeding (79.8%) and dyspareunia (43.7%) as the main clinical features, with family history, also recognized as a significant risk factor [9].

As far as screening was concerned, nearly three-quarters of the participants (73.5%) knew about the Pap Smear test, with 92% of those who knew it, being aware it is a test to detect CC. However, there were misconceptions, with 1.3% of the women thinking it was a pregnancy test and 6.6% having no idea about the test. The frequency of use among the surveyed women seemed ambiguous. At the same time, 24.1% correctly identified the annual frequency, only 22.8% recognized the 3-year interval as an option, and a significant 34.5% needed to know the recommended frequency. The perceived benefits of early screening were identified by more than two-thirds of the participants (69.9%), with a higher proportion being aware that Pap Smear test hospitals offer this service. A study among 53 women from Sub-Saharan Africa revealed high perceived awareness. However, it was also found that more than half of the participants expressed fear of pelvic examinations, and exactly 34% stated they avoided routine pap tests [12].

The study results revealed that slightly more than half (53.0%) of the women were aware of the HPV vaccine, while nearly half (47.0%) remained unaware. These

Table 5. *Association of social demographic variables with overall awareness levels (n = 513).*

Social demographic variables	Category	Overall awareness level				*p*-value
		Poor (*n* = 426)		Good (*n* = 87)		
		n	%	*n*	%	
Age grouping	18-24	232	54.50	39	44.80	0.007*
	25-34	65	15.30	19	21.80	
	35-44	58	13.60	22	25.30	
	45-55	56	13.10	7	8.00	
	More than 55	15	3.50	0	0.00	
Marital status	Single	261	61.30	48	55.20	0.485
	Married	140	32.90	36	41.40	
	Divorced	16	3.80	2	2.30	
	Widow	9	2.10	1	1.10	
Educational status	Illiterate	1	0.20	0	0.00	0.416
	Primary	5	1.20	0	0.00	
	Intermediate	4	0.90	2	2.30	
	High School	76	17.80	11	12.60	
	University	340	79.80	74	85.10	
Employment status	Employed	70	16.40%	26	29.90	0.007*
	Unemployed	348	81.70%	61	70.10	
	Retired	8	1.90%	0	0.00	
Duration of marriage	Not married	261	61.30%	48	55.20	0.412
	1-2 Years	15	3.50%	6	6.90	
	3-4 Years	13	3.10%	2	2.30	
	5-6 Years	6	1.40%	0	0.00	
	7 years or more	131	30.80%	31	35.60	

Chi-square test used to determine statistical significance. *p-value < 0.05 considered statistically significant.

awareness levels were significantly lower compared to a study conducted in Great Britain, which revealed that more than three-quarters (77.6%) of the women were aware of the HPV vaccine [13]. The differences between the two could be attributed to several factors, such as varying levels of public health education, differences in healthcare policies, cultural attitudes toward vaccination, and the availability of information about HPV in each region. The uptake of the vaccine was even lower, with only 6.6% of the women having received it. Among those aware, social media emerged as the leading source of information (44.5%), followed by awareness campaigns (36.0%) and doctors (32.0%). Significant knowledge gaps were evident, with less than 43.6% of the surveyed women being aware that it can be administered to those aged 25 years or younger. Patel et al. [14]'s findings were consistent with the results, showing that only 5.5% had taken the HPV vaccine despite being well-informed about it.

Age emerged as a significant socio-demographic factor influencing awareness of CC. Notably, individuals in the 35-44 years age group demonstrated a higher level of awareness. This could be attributed to experience interacting with healthcare providers and a likelihood of being more attuned to health-related information, particularly as they approach midlife when health screenings, including those for cancer, become more relevant [15]. Additionally, employment status played a crucial role, as employed individuals had a markedly higher level of good awareness (29.9%) compared to their unemployed counterparts. The contrast between the employed and unemployed was significant, with only 16.4% of employed individuals falling into the poor awareness category, highlighting the potential impact of employment on access to information and health education. This could be attributed to better access to education resources through workplace health programs, health insurance, regular health check-ups, and frequent interactions with colleagues [16]. Other social demographic variables were not significantly associated with awareness.

Despite many strengths, this study was marred by a few limitations. One of them was the reliance on a descriptive research design, which was effective for identifying associations between variables but did not establish causality. Additionally, the collection of data online introduced the potential for bias, as responses depend on participants' self-reporting without verification. This limitation was mitigated by piloting the questionnaire with a small group to improve question clarity. Additionally, the study's focus on women in the Jeddah region limited the generalizability of the results to the wider population of Saudi Arabia. Future research should consider longitudinal studies to track changes over time and explore causal relationships.

Conclusion

The study highlighted significant awareness gaps regarding CC symptoms, risk factors, and preventive measures among women in Jeddah, Saudi Arabia. While a majority correctly identified common symptoms and risk factors, misconceptions and lack of knowledge about screening practices and the HPV vaccine remain prevalent. Socio-demographic factors such as age and employment status significantly influence awareness levels. Public health education campaigns are imperative to enhance CC awareness and promote preventive measures such as the HPV vaccination and effective screening practices like the Pap smear test.

List of Abbreviations

CC	Cervical Cancer
HPV	Human Papilloma Virus
SPSS	Statistical Package for Social Sciences

Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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None.

Consent to participate

Informed consent was obtained from all the participants.

Ethical approval

The study was approved by the Institutional Review Board of Dr. Soliman Fakeeh Hospital in Jeddah, Saudi Arabia, via the approval number 330/IRB/2022, Dated: June/19/2022.

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