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Knowledge, Attitude and Practice about Pap Smear among Married Women Attending Primary Health Care Centers in Duhok City

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ABSTRACT

Background: *Cervical Cancer (CC) is the only preventable cancer among all the female genital tract cancers when is detected in its pre-malignant stage, but it is a fatal disease once it gets its invasive stages. Early detection of it is performed by a medical screening procedure Pap smear (PS), which is an inexpensive and effectual procedure to look for any cervical cytological changes (pre-malignant or malignant).* ***Objectives:*** *The present study aimed to assess the knowledge, attitude, and practice (KAP) about PS, to identify the barriers that are an impediment to having it, to find out the association between KAP of PS, and find out the association between married women socio-demographic characteristics and their KAP of PS.* ***Methods:*** *A cross-sectional descriptive study was conducted among 400 women at the time of data collection from 7th April 2015 to 30th May 2015. A structured questionnaire was administrated to gather the data related to the knowledge, attitude, and practice regarding PS, in addition to the barriers that impeded women to practice it.* ***Result:*** *Among all women who were interviewed, about 35.9% heard of the Pap smear and 57.1% heard about cervical cancer. Only 7.3% of women had good knowledge about Pap smear, 33% of them had a positive attitude, and 9.5% of them practiced it. The main reason for having the PS was the health provider's advice.* ***Conclusion:*** *The majority of women had low knowledge of PS, and a negative attitude and was not practicing it. Effective media and providing health education are required to improve the level of awareness towards it. A healthcare professional should be contributing to knowledge transfer whenever the opportunity arises.*

Keywords: Knowledge, Attitude, Practice, Cervical cancer, Pap smear

INTRODUCTION

Cervical cancer in women is an important health reproductive problem in low income and in developing countries and it is one of the most common cancers in women worldwide. In spite of it is a fatal problem when it reaches its invasive stages, it is the only preventable one among all the female genital tract cancers when is detected in its pre-malignant stage [1]. Strong evidence shows that the progression of cervical cancer into its later stages can be prevented through screening and treatment of premalignant lesions. So, in developed countries, the incidence of cervical cancer has been controlled due to effective screening programs, especially the systematic use of the Papanicolaou (Pap) smear test for identifying premalignant changes in the cervix [2]. However, in many developing countries, screening services are lacking or are poorly accessible for the majority of the population [3].

The PS test which is used to look for any cytological changes (pre-malignant or malignant) the target of the screening is to discover these changes earlier, like dysplasia or metaplasia and to treat the patient as early as possible. It plays a significant role in reducing both the incidence and mortality of invasive cancer [4].

According to the World Health Organization (WHO), in 2000, globally 288,000 out of 471,000 deaths were new cases of CC, 80% of them were from the developing countries and the greater number of CC related deaths occur in these countries [5].

CC can be avoided by the primary prevention of human Papillomavirus (HPV) infection or by the secondary prevention where the early detection and treatment of precancerous lesions before their progression to an invasive stage [6].

Human Papillomavirus (HPV) accounts for 5.2% of all cancers worldwide, so it is a causative agent of a subset of head and neck, cervical, and anogenital cancers [7].

There are more than 100 types of HPV virus identified [8]. The most common high-risk HPV types associated with CC are HPV-16 and HPV-18, which are responsible for nearly 70% of CC [9].

HPV is transmitted sexually, so women who have had multiple partners or a high-risk partner or who began having intercourse at an early age are more at risk for HPV infection than others. Not every woman infected with HPV will get cervical cancer; however, research indicates that women with HPV who smoke and have used birth control pills for more than 5 years have a greater chance of getting cervical cancer [10]. Additional risk factors for CC include; marriage before 18 years, multiparous, immuno-suppression and family history [11].

In United State (US), Australia, Canada, and Europe, HPV vaccines provide the best protection for girls and boys who have received all 3 vaccine doses and have time to improve their immune response before being sexually active with another person. That's why HPV vaccination is recommended for preteen girls and boys at age 11 or 12 years [5,8]. Ultimately, beneficial assessments in any society are essential to the plans that promote healthy behavior. In Duhok city studies, there are no studies related to the KAP of the PS. While there were many studies conducted in Iraqi cities like Bagdad and Diyala related to CC and its screening [12,13]. The percentage of new cases and mortality rate of CC in Duhok city have increased gradually, but it is a very low percentage when compared to other developing countries. So as in developing countries, many women are still presenting as late with advanced disease and this could be due to lack of knowledge about the CC and PS. In Duhok city, according to Ministry of Health Statistics from 2010-2014 which showed that there is an increase in the number of new cases and some women were dying from CC. Because there was not a CC screening program and may be increasing the risk factors that are related to CC. A more effective educational program is needed to educate Iraqi women about CC and screening tests, including PS (Figure 1).

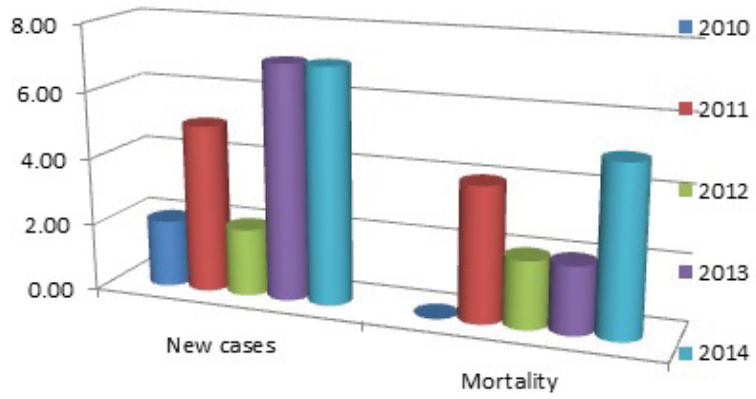

Figure 1 Distribution of the numbers of new cases and mortality data for CC by cancer department in Duhok Governorate health director from 2010-2014

PATIENTS AND METHODS

A cross-sectional descriptive study was done among married women for assessing their knowledge, attitude, and practice in relation to the PS screening in Duhok city. The subject of the present study included all married women aged 21-65 years who attended primary health care centers (PHCCs) in Duhok city, there are 14 PHCCs. Some of these centers were included in this study like Bahdinan, Shahidan, and Khabat. They were selected through using a simple random sampling. Most of the mothers from all socio-economic status attended these centers for routine vaccination, child and maternal health care, dental care, laboratory, antenatal care, family planning, and outpatient department. These services were found in all of these PHCCs. The constructive (non-probability) sampling was applied to 400 married women who attended the PHCCs in Dohuk city, 133 women from each of Bahdinan center and Shahidan center, and 134 women from Khabat center. The study was extended from the time of data collection 7th April 2015 to 30th May 2015.

Inclusion Criteria

The inclusion criteria included women who were married, aged from 21-65 years, attending the PHCCs for any reason during the time of data collection, willing to participate in the study, and were able to speak clearly in Kurdish or Arabic language.

Exclusions Criteria

The exclusion criteria included women who were single, age <21 years and >65 years, health care worker (medical staff), and who disagree to participate in the study.

A close-ended questionnaire was used, it consists of 3 parts:

- The first part of the questionnaire was aimed to collect women socio-economic and demographic characteristics, including (age, gravida, residence, occupation, level of education, and family history of CC, and socioeconomic status (SES))
- The second part attempted to assess the KAP about PS. There were 21 close-ended questions; a list of 9 questions to assess the women's knowledge, 9 items to determine the women's attitude, and 4 questions to evaluate the women's experience regarding PS
- The final section of the questionnaire focuses on the reasons behind doing PS in 4 responses and 9 responses to the barriers that preclude doing it

The overall KAPs of the study participants were assessed using the sum score of each outcome based on Bloom's cut-off point. There were about 9 questions regarding the knowledge of the PS. Putting it on modified Bloom's cut off (Bloom cut off points were adopted from Nahida's KAP) [14]. A score of 80% to 100% of correct responses meant a good knowledge, a score of 50% to 79% put a scorer in a level of medium knowledge and a low knowledge was for the respondents with a score less than 50% of the correct responses. Therefore, the scores with their respective knowledge levels were: 0-4: low knowledge, 5-7: medium knowledge, and 8-9: good knowledge.

The attitude towards PS was assessed by 9 questions put on liker's scales. The questions on this scale had positive and negative responses that ranged from completely agree, agree, no idea, disagree and completely disagree. The scoring system used with respect to respondents' responses was as follows: completely disagree scored 5, disagree scored 4, no idea scored 3, agree scored two, and completely agree scored one point. The responses were summed up and a total score was obtained for each respondent. The mean score was calculated and those scoring above the mean and the mean score had a positive attitude and scores below the mean meant negative attitude towards PS. The highest score was expected to be 45 and the lowest score to be 9, so 0-22 was considered as negative attitude and 23-45 was considered as a positive attitude.

Concerning practice was assessed by looking at the women action towards PS to find if they have been screened, have done regularly, the frequencies of screening, and when they did the first PS. Because there was no screening program in our society, the woman was considered as she had practiced it even she had it one time.

Each question in the questionnaire was coded and the data were entered and analyzed by using the statistical package for social sciences (SPSS version 19). There were two approaches for assessing the result: the first one was a descriptive data analysis approach (frequency and percentage) and the second one was the inferential data analysis approach (Chi-square test and Fisher's exact test), Chi-square test of association was used to compare the proportions. When the expected count of more than 20% of the cells of the table was less than 5, Fisher's exact test was used, while the p-value of ≤ 0.05 was considered statistically significant.

RESULTS

Total 400 women from 3 primary health care centers (PHCCs) in Duhok city were interviewed in this study, the mean age was (mean=33.54, SD=8.69), the majority of women (41.3%) aged between 30-39 years old, 61.4% of the women had 1-4 children, most of the women (97%) were living in urban areas. More than three-quarters of women (80.5%) were housewives and unemployed; 39.3% were primary school graduation, while very low percentage of women (5.3%) had university and high level of education as shown in Table 1.

Table 1 Distribution of women's age, gravida, residency, occupations, levels of education and socio-economic status (Total 400 women)

Socio-Demographic Characteristics	No.	Percentage
Age (years)		
<30	143	35.8%
30-39	165	41.3%
40-49	65	16.3%
50+	27	6.8%
Gravida		
Nulliparous	21	5.3%
1-4	246	61.4%
5+	133	61.4%
Residency		
Urban	388	97.0%
Rural	12	3.0%
Occupation		
Housewife and unemployed	322	80.5%
Manual worker and employed	75	18.8%
High rank occupations	3	0.7%
Level of education		
Illiterate	79	19.7%
Primary School Graduate	157	39.3%
Secondary School Graduate	143	35.7%
University and High Level of Education	21	5.3%
Socio-economic status (SES)		
Low class	163	40.8%
Medium class	195	48.8%
High class	42	10.4%
Total	400	100.0%

Only 144 (36%) of the participants had heard about PS, 3.5% had a family history of CC, and 57.2% had heard about CC (Table 2).

Table 2 Knowledge toward CC and PS

Knowledge toward CC and PS	Yes		No		Total	
	No.	%	No.	%	No.	%
Had heard about CC	229	57.2%	171	42.8%	400	100.0%
Family history of CC	14	3.5%	386	96.5%	400	100.0%
Had heard about Pap test	144	36.0%	256	64.0%	400	100.0%

In 144 out of 400 women who had ever heard about PS, the majority of them (63.9%) received information about PS from their friends, or from a family member among those who had a family history of cervical cancer, while 32.6% from physician or nurse, and only 3.5% of them reported that internet or TV as a source of information, as noted in Figure 2.

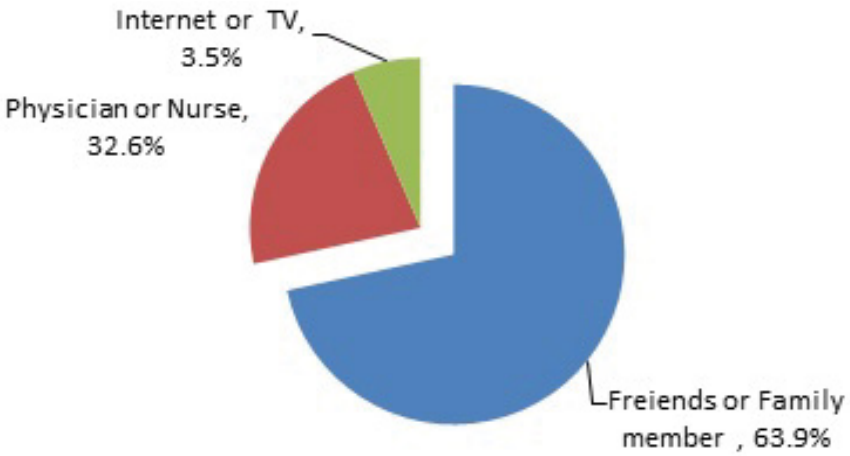

Figure 2 Distribution of women's information sources related to PS

Knowledge about PS

Among 144 of women who heard about PS, less than half (38.9%) of those who heard that PS helps to detect CC earlier, 55.5% knew that PS is done by avoiding douching 2 days before. The majority of them (90.3%) considered that PS reduces the incidence and mortality of the CC, and the highest percentage of women (70.8%) reported that every woman should be tested every 3 years. The highest percentage of women (80.6%) said that PS cannot be done during pregnancy, as shown in Table 3.

Table 3 Proportion of women's knowledge about the PS

Statements	TRUE		FALSE		I don't know	
	No.	%	No.	%	No.	%
Does PS help to detect cervical cancer earlier?	56	38.9%	21	14.6%	67	46.5%
Should the first PS be done at age 21years?	60	41.7%	21	14.6%	63	43.8%
Is PS after age 65 years unnecessary?	36	25.0%	51	35.4%	57	39.6%
Should the women be tested at least every3 years?	102	70.8%	11	7.6%	31	21.5%
Is PS done by avoiding douching two days before?	80	55.5%	10	6.9%	54	37.6%
Can PS be done among pregnant women?	12	8.3%	116	80.6%	16	11.1%
Is PS successful in reducing the chance of having CC?	130	90.3%	4	2.8%	10	6.9%
Does an HPV infection increase the risk of cervical cancer among women?	10	6.9%	11	7.6%	21	85.5%
Is PS performed on non-menstrual period?	97	67.4%	29	20.1%	18	12.5%

Distribution of Women Knowledge Levels about PS

As shown in Figure 3, about two-thirds of women (67.8%) had a low level of knowledge regarding PS.

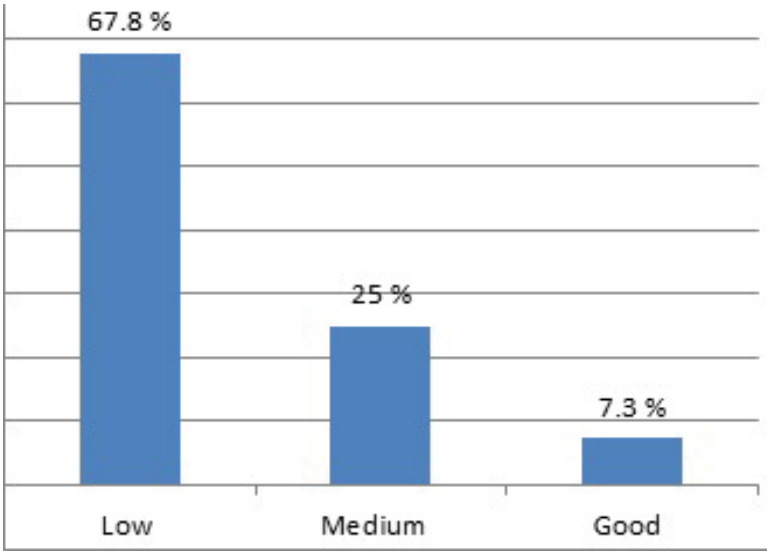

Figure 3 Grading of knowledge levels about PS

Attitude towards PS

Table 4 shows the woman attitude towards PS. About 50% of women disagree that PS is painful. Also, about 41.7% of women disagree that PS is expensive. The majority of women (67.4%) thinks that PS is not time-consuming. More than half of them (52.1%) feel that performing PS does not disturb their privacy. About 43.1% of women agreed and the same percentage of them disagreed. There were the same percentages of women (6.3%) who completely agree and completely disagree that PS is unnecessary in asymptomatic individuals. In addition, one-third of women (33.3%) agreed that PS is indicated when there is an infection or bleeding is seen, 38.2% of women believe that equipment for doing PS is not of good quality. About 43.8% of women disagree on performing PS before experiencing CC symptom.

Table 4 Assessment of women attitude toward PS by frequencies and percentage

Attitude statements	Completely Disagree		Disagree		No idea		Agree		Completely Agree	
	No.	%	No.	%	No.	%	No.	%	No.	%
Is PS painful?	2	1.4%	72	50.0%	23	16.0%	41	28.5%	6	4.2%
Is PS expensive?	2	1.4%	60	41.7%	19	13.2%	46	31.9%	17	11.8%
Is PS time-consuming?	4	2.8%	97	67.4%	12	8.3%	29	20.1%	2	1.4%
Dose Performing PS disturbs the privacy of women?	4	2.8%	75	52.1%	0	0.0%	53	36.8%	12	8.3%
Is PS necessary in asymptomatic individuals?	9	6.3%	62	43.1%	2	1.4%	62	43.1%	9	6.3%
Does PS have effectiveness in early detection of cervical cancer?	1	0.7%	20	13.9%	66	45.8%	48	33.3%	9	6.3%
Is PS equipment of good quality?	21	14.6%	48	33.3%	5	3.5%	55	38.2%	15	10.4%
Do you Prefer doing PS test before experiencing cervical cancer symptoms?	6	4.2%	63	43.8%	2	1.4%	49	34%	24	16.7%
Is it easy for you to talk about cervical cancer?	40	27.8%	36	25.0%	0	0.0%	50	34.7%	18	12.5%

Distribution of Women Attitude towards PS

According to the percentage of attitude towards PS, more than half (67.0%) of women had a negative attitude about PS, while 33.0% had a positive attitude, as shown in Figure 4.

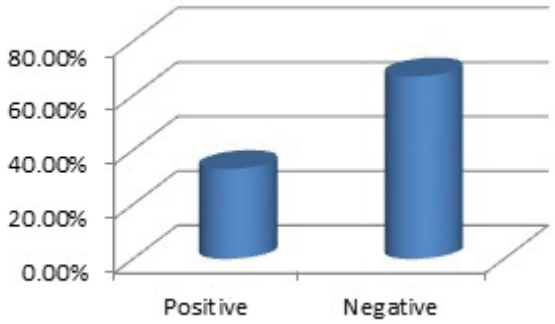

Figure 4 Grading of attitude toward PS

Practice about PS

Regarding whether participants had practiced the PS or not, a small number of them (9.5%) had practiced it, while 90.5% reported that they had never practiced it. Among those women who had practiced the test, only 5.3% had a regular PS while 94.7% of them had irregular PS, 79.0% practiced one time only, while 10.5% for both who practiced 2-3 times and more, and 68.4% had practiced before 3 years, and the same percentage (15.8%) for both who practiced during the last 6 months or last year; as noted in the Table 5.

Table 5 Practicing of women toward PS

Items	Response	No.	Percentage
Types of practice	Have been tested	38	9.5%
	been Never have tested	362	90.5%
Doing PS	Regularly	2	5.3%
	Irregularly	36	94.7%
Frequent you have done the PS	One time	30	79.0%
	Two times	4	10.5%
	Three times and more	4	10.5%
When you have done first PS	During the last 6 months	6	15.8%
	Last year	6	15.8%
	Before 3 years	26	68.4%
Total		38	100.0%

Reasons for having PS

Among 38 women who practiced PS, the main reasons for doing PS were a health provider advice in 89.6%, followed by 7.8% who heard from the mass media, as shown in Table 6.

Table 6 The reasons for having a PS among women practiced PS (N=38)

Reasons	Yes	%
Health providers' advice	34	89.6%
Self-study	0	0.0%
Discomfort in the genital tract	1	2.6%
From the mass media	3	7.8%
Total	38	100.0%

Reasons for not having PS

Concerning the women who had no practice, the major impediment to having PS was identified among those that had a lack of request by the physician (100%), followed by the reason of lack of knowledge and no discomfort in their genital tract (70.7%, 70.4%) respectively. Other barriers were neglecting despite having knowledge in 29.3%, 17.7% reported both lacks of time and embarrassment; 10.2% considered fearing from the result of the test, only 8.0% reported economic problems; 7.2% imagined that the test was painful, as shown in Table 7.

Table 7 Barriers preventing women from doing the PS

Barriers	Yes		No	
	No.	Percentage	No.	Percentage
No physician advice	362	100.0%	0	0.0%
Lack of knowledge about pap test	256	70.7%	106	29.3%
Lack of time for consulting	64	17.7%	298	82.3%
Neglecting despite having knowledge	106	29.3%	256	70.7%
Not feeling any discomfort in the genital tract	255	70.4%	107	29.6%
Too embarrassing	64	17.7%	298	82.3%
Imagination that pap test is painful	26	7.2%	336	92.8%
Fearing from the result	37	10.2%	325	89.8%
PS procedure is too expensive	29	8.0%	333	92.0%

Association between knowledge level and practice about PS

Among 400 women, only 144 (36.0%) heard about PS; from those more than 1 quarter practiced the PS 38 (26.4%). That means it was about 9.5% of the total number. There was a significant association between practicing PS and women knowledge level about PS (X^2=68.85, $p \leq 0.001$) as shown in Table 8.

Table 8 Proportion of women practicing PS according to the knowlegde level about it

Practicing PS	Knowledge level								p-value
	Low		Medium		Good		Total		
	No.	%	No.	%	No.	%	No.	%	
Yes	3	1.1%	27	27.0%	8	27.6%	38	9.5%	0.001
No	268	98.9%	73	73.0%	21	72.4%	362	90.5%	
Total	271	100.0%	100	100.0%	29	100.0%	400	100.0%	

Association between Attitude and Practice about PS

There was a significant association between women who practiced PS and their attitude towards PS (X^2=78.685, $p<0.001$) as shown in Table 9.

Table 9 Proportion of women practicing PS according to attitude toward it

Practicing PS	Attitude						p-value
	Positive		Negative		Total		
	No.	%	No.	%	No.	%	
Yes	37	28.0%	1	0.4%	38	9.5%	0.001
No	95	72.0%	267	99.6%	362	90.5%	
Total	132	100.0%	268	100.0%	400	100.0%	

Association between Knowledge and Attitude about PS

Regarding the association between the level of women knowledge and attitude, there was a significant association between them (X^2=302.415, $p \leq 0.001$) as shown in Table 10.

Table 10 Total agreement rate between knowledge and attitude categories

Attitude	Knowledge								p-value
	Low		Medium		Good		Total		
	No.	%	No.	%	No.	%	No.	%	
Positive	13	4.8%	93	93.0%	26	89.7%	132	33.0%	0.001
Negative	258	95.2%	7	7.0%	3	10.3%	268	67.0%	
Total	271	100.0%	100	100.0%	29	100.0%	400	100.0%	

Association of Women's Socio-Demographic Characteristics with their Knowledge Levels about PS

The significant associations: There was a statistically significant association between women's knowledge and their occupations, as shown in Table 11.

Table 11 Association of women's occupations with their knowledge level about PS

Socio-Demographic characteristics	Knowledge level								p-value
	Low		Medium		Good		Total		
	No.	%	No.	%	No.	%	No.	%	
Occupation									
Housewife and Unemployed	227	70.5%	78	24.2%	17	5.3%	322	100.0%	p=0.030; Fisher=15.08
Manual worker and employed	39	52.0%	22	29.3%	14	18.7%	75	100.0%	
High rank occupations	3	100.0%	0	0.0%	0	0.0%	3	100.0%	
Total	271	67.8%	100	25.0%	26	7.3%	400	100.0%	

The non-significant associations: There was not a statistical significant association between the women's knowledge about the PS and their age, number of previous pregnancies (Gravida), residency, level of education, family history of CC, and level of SES, as shown in Table 12.

Table 12 Association between women' knowledge toward PS and age, gravida, residency, level of education, family history of CC, and level of SES

Socio-Demographic characteristics	Knowledge level								p-value
	Low		Medium		Good		Total		
	No.	%	No.	%	No.	%	No.	%	
Age (years)									
< 30	107	74.8%	27	18.9%	9	6.3%	143	100.0%	p=0.137; X^2=9.709
30-39	100	60.6%	49	29.7%	16	9.7%	165	100.0%	
40-49	44	67.7%	17	26.2%	4	6.2%	65	100.0%	
50+	20	74.1%	7	25.9%	0	0.0%	27	100.0%	
Gravid									
Nullipara	17	81.0%	4	19.0%	0	0.0%	21	100.0%	p=0.966; X^2=0.572
1-4	164	66.7%	64	26.0%	18	7.3%	246	100.0%	
5+	90	67.7%	32	24.1%	11	8.3%	133	100.0%	
Residency									
Urban	262	67.5%	97	67.5%	29	7.5%	388	100.0%	p=1.000; Fisher=0.350
Rural	9	75.0%	3	25.0%	0	0.0%	12	100.0%	
Level of education									
Illiterate	58	73.4%	18	22.8%	3	3.8%	79	100.0%	p=0.255; X^2=14.762
Primary School Graduate	113	72.0%	37	23.5%	7	4.5%	157	100.0%	
Secondary School Graduate	85	59.4%	42	29.4%	16	11.2%	143	100.0%	
University and High Level of Education	15	71.4%	3	14.3%	3	14.3%	21	100.0%	
Family History of CC									
Yes	6	42.9%	6	42.9%	2	14.3%	14	100.0%	p=0.078; Fisher=4.669
No	265	68.7%	94	24.4%	27	7%	386	100.0%	
Socioeconomic status									
Low class	119	73.0%	37	22.7%	7	4.3%	163	100.0%	p=0.124; X^2=7.230
Medium class	128	65.6%	51	26.2%	16	8.2%	195	100.0%	
High class	24	57.1%	12	28.6%	6	14.3%	42	100.0%	
Total	271	67.8%	100	25.0%	26	7.3%	400	100.0%	

Association between Women' Socio-demographic Characteristic with their Attitude towards PS

The significant association: It was between the women's attitude and their education and family history about CC, as shown in Table 13.

Table 13 Association between women's attitude toward PS and their level of education and family history about CC

Socio-Demographic characteristics	Attitude about PS						p-value
	Positive		Negative		Total		
	No.	%	No	%	No.	%	

Education level							
Illiterate	19	24.0%	60	76.0%	79	100.0%	p=0.039; X^2 =13.294
Primary School Graduate	45	28.7%	112	71.3%	157	100.0%	
Secondary School Graduate	61	42.7%	82	57.3%	143	100.0%	
University and High Level of Education	7	33.3%	14	66.7%	21	100.0%	
Family history of CC							
Yes	9	64.3%	5	35.7%	14	100.0%	p=0.018; Fisher=6.423
No	123	31.9%	263	68.1%	386	100.0%	
Total	132	33.0%	268	67.0%	400	100.0%	

The non-significant associations: It was between the women's attitude towards the PS and their age, number of previous pregnancies (Gravida), residency, and level of SES, as shown in Table 14.

Table 14 Association between women' attitude toward PS with age, gravida, residency, and level of SES

Socio-Demographic characteristics	Attitude about PS						p-value
	Positive		Negative		Total		
	No.	%	No	%	No.	%	
Age (years)							
< 30	38	26.6%	105	73.4%	143	100.0%	p=0.114; X^2=5.949
30-39	64	38.8%	101	61.2%	165	100.0%	
40-49	23	35.4%	42	64.6%	65	100.0%	
50+	7	25.9%	20	74.1%	27	100.0%	
Gravid							
Nullipara	48	32.4%	100	67.6%	148	100.0%	p=0.808; X^2=0.42
1-4	42	35.3%	77	64.7%	119	100.0%	
5+	42	31.6%	91	68.4%	133	100.0%	
Residency							
Urban	129	33.2%	259	66.8%	388	100.0%	p=0.758; Fisher=0.358
Rural	3	25.0%	9	75.0%	12	100.0%	
Occupation							
Housewife or Unemployed	97	30.1%	225	69.9%	322	100.0%	p=0.167; X^2=6.4
Manual worker and employed	34	45.3%	41	54.7%	75	100.0%	
High rank occupations	1	33.3%	2	66.7%	3	100.0%	
Socioeconomic status							
Low class	46	28.2%	117	71.8%	163	100.0%	p=0.096; X^2=4.692
Medium class	67	34.4%	128	65.6%	195	100.0%	
High class	19	45.2%	23	54.8%	42	100.0%	
Total	132	33.0%	268	67.0%	400	100.0%	

Association between Women's Socio-Demographic Characteristics with their Practice of PS

The significant associations: There was a statistically significant association between women's practicing PS and their age, family history of CC and level of SES, as in Table 15.

Table 15 Association between women' practice of PS and their age, family history of CC and level of SES

Socio-Demographic Characteristics	Practicing PS						P- value
	Yes		No		Total		
	No.	%	No	%	No.	%	
Age (years)							
< 30	6	4.2%	137	95.8%	143	100.0%	p=0.033; X^2 =8.721
30-39	23	13.9%	142	86.1%	165	100.0%	
40-49	7	10.8%	58	89.2%	65	100.0%	
50+	2	7.4%	25	92.6%	27	100.0%	
Family history of CC							

Yes	4	28.6%	10	71.4%	14	100.0%	p=0.035; Fisher= 6.138
No	34	8.8%	352	91.2%	386	100.0%	
Socioeconomic status							
Low class	9	5.5%	154	94.5%	163	100.0%	p=0.015; X^2=8.38
Medium class	27	13.8%	168	86.2%	195	100.0%	
High class	2	4.8%	40	95.2%	42	100.0%	
Total	38	9.5%	362	90.5%	400	100.0%	

The non-significant associations: There were not a statistical significant association between the women's practice of PS and their number of previous pregnancies (Gravida), residency, occupations, and level of education, as shown in Table 16.

Table 16 Association of women practicing of the PS with their gravida, residency, occupations, and level of education

Socio-Demographic Characteristics	Practicing PS						p-value
	Yes		No		Total		
	No.	%	No	%	No.	%	
Gravid							
Nullipara	3	14.3%	18	85.7%	21	100.0%	p=0.762; X^2=0.544
1-4	21	8.5%	225	91.5%	246	100.0%	
5+	14	10.5%	119	89.5%	133	100.0%	
Residency							
Urban	37	9.5%	351	90.5%	388	100.0%	p=1.000; Fisher=0.020
Rural	1	8.3%	11	91.7%	12	100.0%	
Occupation							
Housewife and Unemployed	31	9.6%	291	90.4%	322	100.0%	p=0.285; Fisher=4.346
Manual worker and employed	34	45.3%	41	54.7%	75	100.0%	
High rank occupations	1	33.3%	2	66.7%	3	100.0%	
Education level							
Illiterate	5	6.3%	74	93.7%	79	100.0%	p=0.533; Fisher=5.209
Primary School Graduate	18	11.5%	139	88.5%	157	100.0%	
Secondary School Graduate	13	9.0%	130	91.0%	143	100.0%	
University and High Level of Education	2	10.0%	19	90.0%	21	100.0%	
Total	38	9.5%	362	90.5%	400	100.0%	

DISCUSSION

The differences observed between developed and developing countries with or without the Papanicolaou's (Pap) smear. In African countries, like Nigeria, Botswana, Uganda, India, and Thailand many conducted studies showed that women had little knowledge and a negative attitude about CC and PS. This contributed to their non-participation in screening programs, and even those who were screened, they ignore themselves to follow-up for further management once an abnormality is detected in their PS results [15].

Among 400 women who participated in this study, the majority of them (41.3%) aged between 30-39 years, which is similar to studies conducted in Qatar and in Malaysia by where the majority of women were in this age group 35.2% and 51.85% respectively [16,17].

In the present study, a very high percentage of about 97% of women were living in urban areas. This was similar to the results of the study conducted in Iraq, its result was 62.6% [13], and a study in Estonia mentioned that 69.0% of the participants were from urban areas [18]. The differences in these studies are due to the differences in the geographic area where these studies were done. The majority of women in the present study were housewives and unemployed (80.5%). It is not similar to 40.1% that was reported in the United Arab Emirates [19]. More than one-quarter of the subjects of the present study (26.3%) were primary school graduates, nearly the same result (22.4%) was reported in Ghana [20]. The results of these studies are higher than 9.25% in another conducted in Iran [21].

The highest percentage of socio-economic classes in this study was reported as a medium class (48.8%), that is less

than 34.80% which was reported by the researchers in North Eastern India [22]. The disagreement in these results could be due to the differences in their SES scores.

Regarding Knowledge about CC

In the present study, about 57.2% of women heard about CC, similar to this finding, 57.4% was reported among Iraqi women residing outside Iraq (Iraqi-Malaysia) [17]. This was less than that reported in other studies conducted in Nigeria, Korea, and Nepal [21,23,24], but it was higher than a study reported in India [25]. These different results may be because they were conducted among women with different levels of education. So, the majority of women in the present study were primary school graduates, compared to other studies conducted on women who had a secondary or higher level of education. The majority of women had a low level of knowledge about CC (44.5%). This was similar to that reported in Nigeria and Malaysia [17,26], although it was much better than 81.9% that was reported among women in India [27].

Knowledge about PS

In this study, more than one third (36.0%) of women heard about PS, and the main source of information was friend or family member (63.9%) compared to health care providers (32.6%) and the media (3.5%) respectively. It was very low percentage when compared with another study conducted in Kuwait [15], which found 76.9% of the women had heard about the PS and the main source of information was the Gynecologist or family doctor (42.0%), and (81.0%) in other developing countries such as Brazil [28]. The differences in the above studies could be due to the difference of populations involved and various levels of health intervention such as provided screening programs and the health education by the doctor or other health staff were successful in increasing knowledge about CC screening PS among the low-income country.

Regarding women's knowledge about PS in this study, the highest percentage of women had low level of knowledge (67.8%), close to the result 63.3% in one study conducted in North Eastern Brazil [29], 59.4% of women had poor knowledge in other studies one was done in the United Arab Emirates [19], and then another one in Iran [30]. About the good knowledge which was only 7.3%, this disagrees with the good knowledge level (52.3%) in a study in Kuwait [15]. All previous studies related to the knowledge about PS were done in the PHCCs among women with different levels of occupations. So, PHCCs are considered as better areas where the nurses can be provided more information related to PS as general, the purpose of its screening, and follow up, through applying for the awareness program continuously.

Nowadays, the global effort to reduce the incidence and mortality from CC has been through the early screening of women with PS. This method of screening has largely been responsible for the reduction of CC seen in developed countries. In this study, about 90.3% of women agreed that the PS is successful in reducing the incidence and mortality of CC.

Attitude toward PS

This study shows that only 33.0% of women had a positive attitude toward PS. This result nearly agrees with the result of 30.6% [15], but it was very low percentage if compared with the results of other studies which clarified that 85.0%, 85.8% and 87.3% of women like to do PS [16,21,30]. Thus, increasing awareness among women through health facilities about screening programs and public campaigns as conducted in the developed countries would dramatically be helpful in reducing this highly preventable cancer. This study shows that 49.4% of women believed that PS is unnecessary for asymptomatic individuals. More than one third (39.6%) of the women think that taking PS is only when there are gynecological problems, this study is supported by one in Nigeria [31]. This indicates that if the women have poor knowledge about the PS, the frequencies of having it and the purpose of doing it will directly affect their attitude to do it.

Practice of PS

Regarding women practicing PS in some developing countries such as Nepal [21], found that a low percentage of women practiced PS and it's about 10.5%. Also, the low percentage of women who undergo PS (12.6%) has been mentioned among Iraqi women [32]. In the present study, we found that about 9.5% of women practiced PS. The situation was worse in Nigeria where only 5.7% of the study population had been screened for CC using PS [33]. The

low percentage of practicing PS in different developing countries may be due to women knowledge level, which was low or due to the absence of routine CC screening program. In contrast to developing countries, higher prevalence of practicing PS was reported in many developed countries, such as in England, where 80% of women practiced PS [34], and in the United State of America (USA) 87% of women were reported having PS [35]. However, in the present study, about 97.4% of women underwent PS according to their health providers' advice. This finding was supported by another study which reported that two third of Iraqi women (60.7%) had done PS according to their doctor's advice, this indicated that the doctor's advice was the main reason to prevent CC [32].

Barriers to Practicing PS

All of the women who didn't practice PS consider that "no physician advice" was the main barrier for not having PS, and 70.7% of them reported that lack of knowledge about the PS as the main barrier to not having PS. Only 17.7% of them felt too embarrassed to have PS. Many studies have identified that factor "not advised to do PS from health care workers" by women was the main barrier to uptake the test [22,36]. In this study, about 70.4% of women didn't practice PS because they did not feel any discomfort in their genital tract. This result might be indicating that the women do not have sufficient knowledge from the medical staff to do the PS at health care facilities and this explains why women do not consider PS as an important test. Therefore, health care providers can provide more information through their job to prevent CC [22]. And only 8.0% mentioned that PS procedure was costly for them, this result indicated that the majority of women had adequate SES, while in a tertiary care hospital in India where 6.75% of the participants reported that PS procedure is too expensive [36].

There was a significant association between women's knowledge and attitude about PS. So women who had good knowledge of PS had a positive attitude towards it. This finding is supported by another study [30]. And the same between women's knowledge of PS and practicing it. Therefore, women who had a good knowledge about PS had practiced it [19].

The interrelationship in this study clarified that the increasing knowledge of PS is translated into improving the attitude towards it and finally removes impediments to practice it. There was a significant association between women's attitude and practice of PS. Thus, women who had a positive attitude towards PS performed it more than women who had a negative attitude. This finding disagrees with other studies which reported that there was no association between attitude and practice. Positive attitudes about PS are one of the most important factors that motivate women to enhance health status by practicing PS as soon as possible. In this study, there was no statistically significant association between women's knowledge of PS and age, gravidity, residency, level of education, family history of CC, and SES, but there was a significant association towards occupation, these findings are similar to others studies [15,21,30].

Regarding the association between the attitude and these demographic variables, there was no significant association between attitude and these variables (age, gravidity, residency, occupation, and SES). Some of these findings (age, gravidity, and SES) were similar to that found by Al Sairafi, et al., and Shrestha, et al., [15,21,29]. Concerning the association between women's demographics variable and the practicing of PS, in the present study, there was a significant association between women practicing PS and age, family history of CC and SES. Regarding age, it agreed with Al Sairafi, et al., and Shrestha, et al., [15,21]. But disagree about the association between SES and practicing PS [15,21,30].

CONCLUSION

The majority of women had limited knowledge regarding the CC and PS. More than two-third of women had a negative attitude towards PS. The highest percentages of them have not practiced PS, and very low percentage of women practiced it, but still, they had it one time in their life. Not being advised by health care providers, lack of knowledge about PS and not feeling any discomfort in their genital tract has been recognized as the main barriers to practicing PS in the study. There were strong associations between the aspects: knowledge, attitude, and practice.

LIMITATIONS

No previous (KAP) study about PS was conducted in Duhok city. The sample population may potentially bias the generalization of the findings; further study is needed to assess the larger samples of women and using random sampling.

DECLARATIONS

Conflict of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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