

## Health Belief Model for Women regarding Cervical Cancer

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### Abstract

**Background:** Determination of women's beliefs about cervical cancer and pap smear test are so important to overcome barriers and provide screening behavior which help in reduction of cervical cancer morbidity and mortality among women. **Aim:** Assess health beliefs of women regarding cervical cancer. **Research design:** Descriptive research design was utilized in this study. **Setting:** This study was conducted at Obstetrics and Gynecology Outpatient Clinic affiliated to Benha University Hospital. **Sample:** Simple random sample was used in this study and included 351 women. **Tools:** Two tools were used in this study **I):** A structured interviewing questionnaire consisted of two parts: **Part I)** included A) Socio-demographic characteristics, B) Medical history and C) Obstetric history. **Part II)** Concerned with knowledge of studied women regarding cervical cancer **II):** Health Belief Model scale to assess women's beliefs regarding cervical cancer. **Results:** 29.3% of studied women had gynecological diseases, 1.7% of them had surgery in the reproductive system and .9% of them had family history of cervical cancer. 24.5% of studied women had good total knowledge level about cervical cancer and 44.7% of them had high total health belief level regarding cervical cancer. **Conclusion:** There was a highly statistically significant relation between total knowledge level of the studied women and their socio demographic characteristics. There was a highly statistically significant relation between total knowledge level of the studied women and their total health belief level about cervical cancer. **Recommendations:** Health education programs should be developed and implemented for Egyptian women to improve their knowledge, health beliefs and practices toward early detection and prevention of cervical cancer.

**Key words:** Cervical cancer, Health Belief Model, Women.

### Introduction

Cervical cancer is a major public health concern globally and a significant cause of mortality and morbidity in women. It is the fourth most common cancer among women globally, with an estimated 604 000 new cases and 342 000 deaths in 2020. About 90% of the new cases and deaths worldwide in 2020 occurred in low- and middle-income countries. High cervical screening coverage is recognized as the most important measure in achieving reductions in incidence and mortality. Screening coverage among women in low- to middle-income countries is on average 19%, compared to 63% in high income countries (World Health Organization (WHO), 2022).

Cervical cancer stages are based upon the International Federation of Gynecology and Obstetrics (FIGO) staging system. These stages are categorized by the amount of cancer in the cervix and the spread of cancer outside the cervix. Stage I: The cancer has spread from the cervix lining into the deeper tissue but is still just found in the uterus. It has not spread to other parts of the body. Stage II: The cancer has spread beyond the uterus to nearby areas, such as the vagina or tissue near the cervix, but it is still inside the pelvic area. Stage III: The tumor involves the lower third of the vagina and/or has spread to the pelvic wall; causes swelling of

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the kidney, called hydronephrosis; stops a kidney from functioning; and/or involves regional lymph nodes. Stage IV: The cancer has spread to the bladder or rectum and other parts of the body (**Bhatla et al., 2019**).

Women with early cervical cancer and precancerous lesions usually have no indicators. Symptoms often do not begin until a precancerous lesion becomes a true invasive cancer and metastasizes into nearby tissues. When this occurs, the most common symptoms are as follows: abnormal vaginal bleeding such as bleeding after sex (vaginal intercourse), bleeding after menopause, bleeding and spotting between periods, and having longer or heavier menstrual periods than usual, pain during sex and abnormal vaginal discharge (**Mabotja et al., 2021**).

Surgery and radiation therapy are the primary treatment options for cervical cancer. Surgical methods such as hysterectomy and conization are appropriate for early stages of cervical cancer. Locally advanced cervical cancer has a higher risk of recurrence due to high-risk factors such as large tumor size and positive parametrial margins, and therefore, surgical methods may not be appropriate. Concurrent platinum-based chemoradiation is the preferred method of treatment of locally advanced cervical cancer and it has been associated with a greater overall survival rate and a lower risk of recurrence than radiotherapy alone (**Gamaoun, 2018**).

The HBM is a simultaneous process used to encourage healthy behavior among women who put themselves at risk of developing cervical cancer. Women must evaluate their perceptions of susceptibility and the severity of developing cervical cancer. Then, it is necessary to feel threatened by these perceptions. Environmental and socio-demographic factors can also contribute as well as cues to action such as mass media, health professionals, neighbors,

friends, and relatives. Finally, the benefits of change must be weighed against the barriers to change behavior to determine that taking action (screening) will be worthwhile (**Ahmed et al., 2018**).

Community Health Nurse (CHN) plays a key role in health education and promotion. Moreover, the nurse has an important task of imparting information about risk factors of cervical cancer, discovering early signs, and encouraging women to undergo cervical cancer screening frequently. CHN should assess the knowledge, attitudes, beliefs, behaviors and practices of women regarding cervical cancer and provide health education according to knowledge level. CHN have the communication and teaching skills to work with women and communities to change behaviors to reduce risk factors and change false beliefs about cervical cancer. Therefore, CHN need to address the health beliefs of the women regarding cervical cancer (**Wipperman et al., 2018**).

### **Significance of the study:**

Egypt has a population of 30.55 millions women ages 15 years and older who are at risk of developing cervical cancer. Cervical cancer ranks as the 13<sup>th</sup> leading cause of female cancer and the 12<sup>th</sup> leading cause of cancer deaths of female cancer deaths in Egypt. Cervical cancer is the 9<sup>th</sup> most common female cancer in women aged 15 to 44 years in Egypt. Current estimations in 2020 indicate that about 1,320 new cervical cancer cases are diagnosed annually and about 744 cervical cancer deaths occur annually in Egypt, so it is important to assess health beliefs of women regarding cervical cancer (**Yakout et al., 2022**).

### **Aim of the study**

The aim of the study was to assess health beliefs of women regarding cervical cancer.

**Research questions:**

- What is the level of women's knowledge regarding cervical cancer?
- What are the women's health beliefs regarding cervical cancer?
- Is there a relation between socio-demographic characteristics of women and their level of knowledge about cervical cancer?
- Is there a relation between women's knowledge and their health beliefs?

**Subject and method**

**Research design:**

A descriptive research design was used in carrying out this study.

**Setting:**

This study was conducted at Obstetrics and Gynecology Outpatient Clinic affiliated to Benha University Hospital.

**Sampling:**

Simple random sample was used in this study. The total number of women attended the previously mentioned setting during the year (2019-2020) was 2880. The sample size was calculated using the following formula:

$$n = \frac{N}{1 + Ne^2}$$

Where (n) is sample size

(N) Total number of women attended the pre- mentioned setting during the year (2019-2020).

(e) is coefficient factor=0.05. Sample size was 351 women.

**Tools of data collection:-**

Two tools were used to collect the data:

**Tool (1):** A structured interviewing questionnaire: It was designed by the investigator and revised by supervisor staff after reviewing related literature and it was written in simple clear Arabic language and consisted of two parts to assess the following:

**Part 1:** It was be classified into:

**A-Socio-demographic characteristics** of studied women; which included six closed ended questions about age, marital status,

educational level, residence, occupation and monthly income.

**B- Medical history** of studied women; which included ten closed ended questions about presence of chronic diseases, chronic diseases suffering from, gynecological diseases, type of gynecological diseases, surgeries in the reproductive system, type of surgery, previous history of any type of cancer, type of cancer, family history of cervical cancer and the degree of relation.

**C- Obstetric history** of studied women; which included seven closed ended questions about age at marriage, number of births, number of abortions, age at first birth, using family planning method, type of family planning method and the period of using the contraceptive method.

**Part II:** It was concerned with the studied women knowledge regarding cervical cancer which included twelve closed ended questions (multiple choice type) about meaning of cervical cancer, risk factors, symptoms, diagnosis, appropriate time for women to have a Papsmear test, the number of times a woman can have a Pap smear test, preparation for the Papsmear test, treatment of cervical cancer, factors affecting treatment of cervical cancer, complications of cervical cancer, prevention of cervical cancer and time for HPV vaccination.

**Scoring system:**

The scoring system for each answer was given as follows: (2) score for correct and complete answer, (1) score for correct and incomplete answer and (0) score for don't know. Total knowledge score = 24 points

The total knowledge score was considered good if the total score >75% (>18), while considered average if the total score is 50-75% (12-18) and considered low if the total score < 50% (<12).

**Second tool:**

Health Belief Model Scale adapted from (**Champion and Skinner, 2008**). It was modified by the investigator to assess

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women's beliefs regarding cervical cancer which specify six domains (perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action and self-efficacy).

### **Scoring system of Health Belief Model:**

The scale included 47 items on a 3-point Likert scale (agree, uncertain, disagree). Perceived susceptibility was assessed using six items, perceived severity was assessed using ten items, perceived benefits was assessed using five items, perceived barriers was assessed using fifteen items, beliefs of the studied women about cues to action was assessed using six items and self-efficacy was assessed using five items. The scoring system of health belief model was calculated as follows: (2) score for agree, (1) score for uncertain and (0) score for disagree. These were respectively scored for positive items and reversed to negative items.

The total HBM scale score = 94

The total score of HBM was considered high if the total score > 75% (>71), while considered moderate if the total score is 50-75% (47-71) and considered low if the total score < 50% (<47).

### **Content validity:**

The tools were reviewed for comprehensiveness, appropriateness and legibility by three experts of Faculty of Nursing Staff from the Community Health Nursing Specialties. The experts ascertained the face and content validity of the tools.

### **Reliability of the tools:**

The reliability of the tools was done by Cornbrash's Alpha coefficient test which revealed that each of the two tools consisted of relatively homogeneous items as indicated by the moderate to high reliability of each tool. The internal consistency of knowledge was 0.920 and health belief model was 0.804.

### **Ethical consideration:**

Permission has been obtained orally

from each woman before conducting the interview and given a brief orientation to the purpose of the study. They were also reassured that all information gathered would be confidential and used only for the purpose of the study. The women had right to withdraw from the study at any time without giving any reasons. No names were required on the forms to ensure anonymity and confidentiality.

### **Pilot study:**

A pilot study was conducted on 10% of the total sample (35 woman) to test the content, applicability and simplicity of the tool. Based on the pilot study the tools were organized. Organization of the tool included rephrasing, rearrangement of some questions. The pilot study was included in the study as no modifications were done.

### **Field work:**

The actual field work was carried out over a period of 6 months from the beginning of July to the end of December 2021. The study was conducted by the investigator at the Obstetrics and Gynecology Outpatient Clinic affiliated to Benha University Hospital. Data were collected by interviewing the women during their visits to the previously mentioned setting. The investigator was available at the study setting from 9 am to 1 pm three days per week (Saturday, Monday and Tuesday). The investigator explained the purpose and importance of the study to the women and obtained their consent. The average number of interviewed women was between 4-5 women/day depending on their response and understanding, each questionnaire takes about 30 to 40 minutes to be filled depending upon the women understanding and response.

### **Statistical analysis:**

All collected data were organized, tabulated and analyzed using appropriate statistical test. The data were analyzed by using the Statistical Package for Social

Science (SPSS) version 21. Which was applied to calculate number and percentages for qualitative data mean  $\pm$ S.D for quantitative data as well as test statistical significance and

associations by using chi-square test and person correlation test to detect the associations between the variables for (p-value). The observation differences and associations were considered as the following:

- **Highly Significant (HS)**  $P < 0.001$ .
- **Significant (S)**  $P < 0.05$ .
- **Not Significant (NS)**  $P > 0.05$ .

**Results:**

**Table (1):** Shows that 42.7% of the studied women aged from 20 to <30 with mean age  $35.51 \pm 4.26$  years, while 92.3% of the studied women were married and 42.7% of them had university education. Regarding to the residence 74.6% of the studied women were from rural areas, 74.6% of the studied women didn't work and 55.3% of them had enough monthly income.

**Table (2):** Shows that 15.4% of the studied women had chronic diseases, and 7.7% of them were suffering from hypertension, while 29.3% of them had gynecological diseases, and 52.4% of them were suffering from vaginitis. Also, 1.7% of the studied women had surgery in the reproductive system and all of them had excision of fibroids. Also 96.1% of them didn't have previous history of any type of cancer and 99.1% didn't have family history of cervical cancer.

**Table (3):** Shows that 59.3% of the studied women married at the age from 20 to <30 years. Concerning the number of births, 32.1% of them had three births, while 68.5% didn't have abortion and 69.1% had first birth at the age from 20 to <30 years. Also 91.7% of the studied women used family planning methods, 73.7% of them used intrauterine device and 41.4% of them used the method for more than five years.

**Figure (1):** Illustrates that 42.5% of the studied women had poor total knowledge level, while 33% of them had average total knowledge level and 24.5% of them had good total knowledge level about cervical cancer.

**Figure (2):** Shows that 22.5% of the studied women had low total health belief level, while 32.8% of them had moderate total health belief level and 44.7% of them had high total health belief level regarding cervical cancer.

**Table (4):** Shows that there were a highly statistically significant relation between total knowledge level of the studied women and their socio demographic characteristics.

**Table (5):** Shows that, there was a highly statistically significant relation between total knowledge level of the studied women and their total health belief level about cervical cancer.



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**Table (1): Frequency distribution of the studied women regarding their socio demographic characteristics (n=351).**

Socio demographic characteristics	No.	%
<b>Age in years</b>		
20 - <30	150	<b>42.7</b>
30 - <40	139	39.6
≥40	62	17.7
<b>Mean ±SD</b>	<b>35.51±4.26</b>	
<b>Marital status</b>		
Married	324	<b>92.3</b>
Single	27	7.7
<b>Educational level</b>		
Don't read and write	45	12.8
Basic education	17	4.8
Secondary education	139	39.6
University education	150	<b>42.7</b>
<b>Residence</b>		
Urban	89	25.4
Rural	262	<b>74.6</b>
<b>Occupation</b>		
Working	89	25.4
Not working	262	<b>74.6</b>
<b>Monthly income</b>		
Enough	194	<b>55.3</b>
Not enough	148	42.2
Enough and save	9	2.6

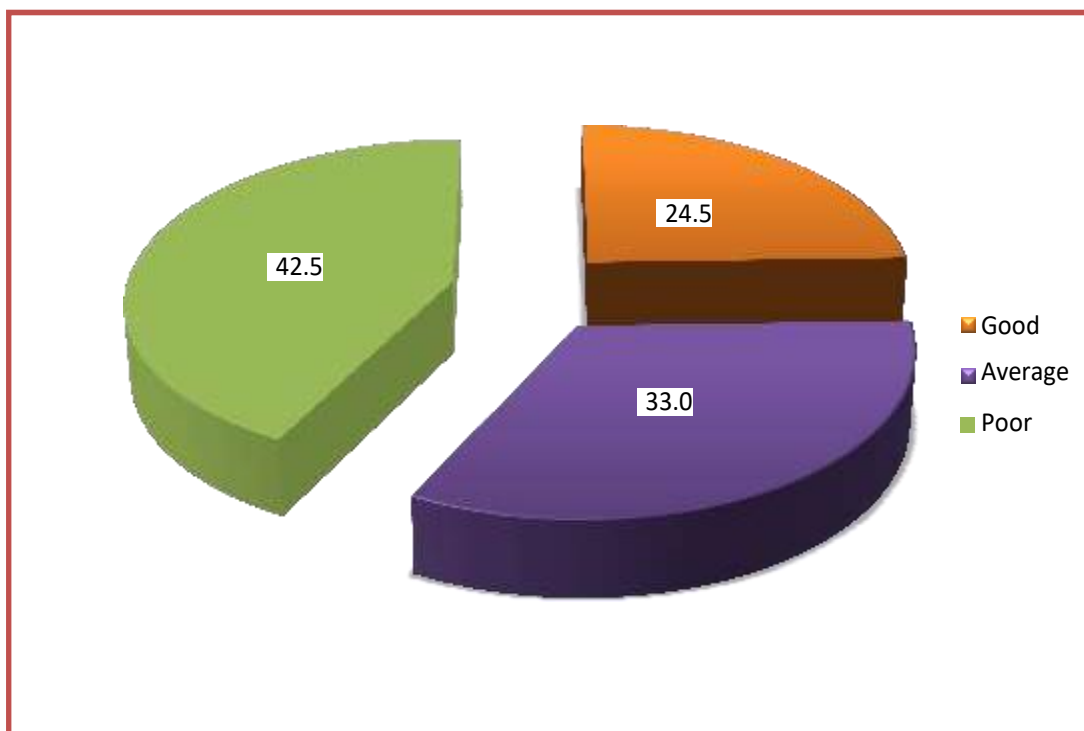
**Table (2): Frequency distribution of the studied women regarding their medical history (n=351).**

Medical history	No.	%
<b>Presence of chronic diseases</b>		
No	297	84.6
Yes	54	<b>15.4</b>
<b>Chronic diseases suffering from (n=54).</b>		
Chronic kidney diseases	10	2.8
Diabetes	17	4.8
Hypertension	27	<b>7.7</b>
<b>Gynecological diseases</b>		
No	248	70.7
Yes	103	<b>29.3</b>
<b>Type of gynecological diseases (n=103).</b>		
Uterine fibroids	5	4.9
Polycystic ovaries	44	42.7
Vaginitis	54	<b>52.4</b>
<b>Surgeries in the reproductive system</b>		
No	345	98.3
Yes	6	<b>1.7</b>
<b>Type of surgery (n=6).</b>		
Excision of fibroids	6	<b>100.0</b>
<b>Previous history of any type of cancer</b>		
No	340	<b>96.1</b>
Yes	11	<b>3.9</b>
<b>Type of cancer (n=11).</b>		
Breast cancer	11	<b>100.0</b>
<b>Family history of cervical cancer</b>		
No	348	<b>99.1</b>
Yes	3	.9
<b>The degree of relation (n=3).</b>		
2 <sup>nd</sup> degree of relation	1	33.3
4 <sup>th</sup> degree of relation	2	<b>66.7</b>

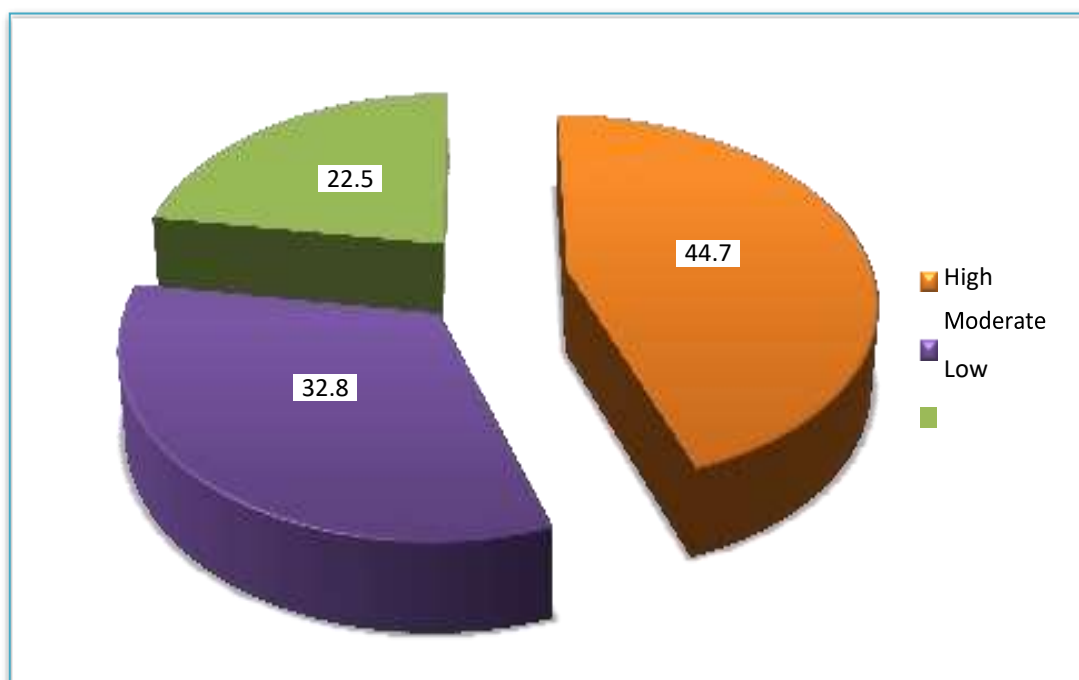
**Table (3): Frequency distribution of the studied women regarding their obstetric history (n=351).**

Obstetric history	No.	%
<b>Age at marriage</b>		
< 20	116	33.0
20 - <30	208	<b>59.3</b>
<b>Number of births (n=324).</b>		
Once	62	19.1
Twice	88	27.2
3 times	104	<b>32.1</b>
4 times or more	52	16.0
Not present	18	5.6
<b>Number of abortions (n=324).</b>		
Once	68	21.0
Twice	26	8.0
3 times or more	8	2.5
Not present	222	<b>68.5</b>
<b>Age at first birth (n=324).</b>		
< 20	73	22.5
20 - <30	224	<b>69.1</b>
30 - 40	9	2.8
Not present	18	5.6
<b>Using family planning methods (n=324).</b>		
No	27	8.3
Yes	297	<b>91.7</b>
<b>Type of family planning methods (n=297).</b>		
Intrauterine device	219	<b>73.7</b>
Contraceptive pills	157	52.9
Contraceptive injections	51	17.2
Natural methods	8	2.7
<b>The period of using the contraceptive method: (n=297).</b>		
< 1 year	53	17.8
1 < 3 years	35	11.8
3 < 5 years	86	29.0
>5 years	123	<b>41.4</b>





**Figure (1): Percentage distribution of the studied women regarding their total knowledge level (n=351).**



**Figure (2): Percentage distribution of the studied women regarding their total health belief level (n=351).**

**Table (4): Statistically relation between socio demographic characteristics of studied women and their total knowledge level (n=351).**

Socio demographic characteristics	Total knowledge level						X <sup>2</sup>	p-value
	Poor (n=149)		Average (n=116)		Good (n=86)			
Age in years	No	%	No	%	No	%		
20 - <30	53	35.6	61	52.6	36	41.9	40.535	<b>.000**</b>
30 - <40	53	35.6	36	31.0	50	58.1		
≥40	43	28.9	19	16.4	0	0.0		
<b>Marital status</b>								
Married	131	87.9	116	100.0	77	89.5	14.639	<b>.001**</b>
Single	18	12.1	0	0.0	9	10.5		
<b>Educational level</b>								
Don't read and write	35	23.5	10	8.6	0	0.0	76.174	<b>.000**</b>
Primary education	0	0.0	17	14.7	0	0.0		
Secondary education	69	46.3	36	31.0	34	39.5		
university education	45	30.2	53	45.7	52	60.5		
<b>Residence</b>								
Urban	27	18.1	27	23.3	35	40.7	15.081	<b>.001**</b>
Rural	122	81.9	89	76.7	51	59.3		
<b>Occupation</b>								
Work	27	18.1	27	23.3	35	40.7	15.081	<b>.001**</b>
Do not work	122	81.9	89	76.7	51	59.3		
<b>Monthly income</b>								
Enough	62	41.6	63	54.3	69	80.2	53.004	<b>.000**</b>
Not enough	87	58.4	44	37.9	17	19.8		
Enough and save	0	0.0	9	7.8	0	0.0		

**Table (5): Statistically relation between total knowledge level of the studied women and their total health belief level about cervical cancer (n=351).**

Total knowledge level	Total health belief level						X <sup>2</sup>	p-value
	Low (n=79)		Moderate (n=115)		High (n=157)			
	No.	%	No.	%	No.	%		
Poor (n=149)	44	55.7	53	46.1	52	33.1	33.654	.000**
Average (n=116)	27	34.2	45	39.1	44	28.0		
Good (n=86)	8	10.1	17	14.8	61	38.9		

**Discussion:**

Cervical cancer is now the fourth most common gynecologic malignant tumor worldwide after breast cancer to cause death among the female population. Early detection and public awareness of this disease and its risk factors can help in reduction of morbidity and mortality among women and help to reduce disease burden on healthcare services. Cervical cancer is a preventable disease and easily detectable and treatable in early stages. HBM is one of the models used to improve preventive behaviors through improving a person's beliefs. It assumed that improving beliefs of women about cervical cancer is a basic stone to improve the practice of people toward cervical cancer preventive measures (Eshetu et al., 2019).

Regarding to medical history of the studied women, the present study revealed that most of studied women didn't have previous history of any type of cancer and didn't have family history of cervical cancer. These findings were in the same line with Mahmoud et al. (2021), who studied "Effect of the educational package based on health belief model on nursing students' knowledge and attitude regarding human papillomavirus and cervical cancer, Benha, Egypt" (n=195), who

found that 98.5% and 95.9% of studied sampled didn't have previous medical history of any type of cancer and family didn't have a previous history of cervical cancer or human papillomavirus respectively. This might be due to the lack of women awareness about cervical cancer, as some women had family history of hysterectomy without knowing the reason.

Regarding to obstetric history of the studied women, the present study showed that slightly less than three fifths of the studied women married at the age from 20 to <30 years. This finding agreed with Ahmed et al. (2018), who studied "Health belief model- based educational program about cervical cancer prevention on women knowledge and beliefs, Helwan City, Egypt" (n=150), who found that 63.3% of the participants were married after the age of 20 years. This might be due to the desire to complete school education before being married and it is the common age of marriage.

Regarding number of births and abortion of the studied women, the current study revealed that nearly one third of studied women had three births and more than two thirds of them didn't have abortion. These findings disagreed with El-Sayed et al.

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(2020), who found that 53.3% of studied women had births from three to five and 57.2% of them weren't exposed to abortion. This might be due to increased women awareness about the importance of antenatal care.

Concerning to using family planning methods, the present study showed that most of the studied women used family planning methods and less than three quarters of them used intrauterine device. These findings agreed with **Omran et al. (2020)**, who found that 86.045% of study subjects used contraceptive methods and 56.7% of them used intrauterine device. This might be due to increased women awareness about using family planning methods and most women preferred using intrauterine device because they forget taking pills.

The present study revealed that slightly more than two fifths of the studied women had poor total knowledge level, while nearly one third of them had average total knowledge level and nearly one quarter of them had good total knowledge level about cervical cancer. These findings were in the same line with **Halle-Ekane et al. (2018)**, who studied "Knowledge of cervical cancer and its risk factors, attitudes and practices towards pap smear screening among students in the university of Buea, Cameroon" (n=416), who found that 182(43.8%) of the participants had poor knowledge, 129(31%) had fair knowledge and only (105)25.2% had good knowledge about cervical cancer. This might be due to most of the studied women were from rural areas where the health education and services are inadequate.

Concerning to total health belief level regarding cervical cancer, the present study revealed that more than two fifths of the studied women had high total health belief level regarding cervical cancer. This finding agreed with **Yakout et al. (2016)**, who found that 53.6% of study subjects had positive

overall beliefs regarding cervical cancer. This might be due to the fact that most of the studied women were educated and slightly more than two fifths of them had university education which affect positively on their health beliefs.

The present study revealed that there were a highly statistically significant relation between total knowledge level of the studied women and their socio demographic characteristics. This finding agreed with **Omran et al. (2020)**, who found that there were highly statistically significant relation between socio demographic characteristics of the studied women and total knowledge score. This might be due to the socio demographic characteristics play an important role in increasing knowledge.

The current study showed that there was a highly statistically significant relation between total knowledge level of the studied women and their total health belief level about cervical cancer. This finding was supported with **Ahmed et al. (2018)**, who reported that there were statistically significant positive correlations between total knowledge scores and health belief scores of the study sample before program. This finding also was supported with **El-kest et al. (2021)**, who stated that there was a significant positive correlation between the total knowledge score and total belief scores pre and post program. This might be due to women high educational level had a great effect on their knowledge which affect their health beliefs.

### **Conclusion**

Nearly one quarter of the studied women had good total knowledge level about cervical cancer and more than two fifths of the studied women had high total health belief level regarding cervical cancer. There was a highly statistically significant relation between total knowledge level of the studied women and their socio demographic

characteristics. There was a highly statistically significant relation between total knowledge level of the studied women and their total health belief level about cervical cancer.

#### **Recommendations**

- Health education program should be developed and implemented for Egyptian women to improve their knowledge, health beliefs and practices toward early detection and prevention of cervical cancer.
- Booklets about cervical cancer should be provided for women attending to outpatient clinics to increase women awareness about cervical cancer.
- Further studies are needed on a wide scale to assess the barriers of undertaking preventive measures of cervical cancer.

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## نموذج الاعتقاد الصحي للسيدات تجاه سرطان عنق الرحم

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إن تحديد معتقدات النساء حول سرطان عنق الرحم واختبار مسحة عنق الرحم مهم جدا للتغلب على العوائق وتوفير سلوك الفحص الذي يساعد في الحد من نسب الاصابات والوفيات بسرطان عنق الرحم بين النساء لذلك هدفت الرسالة إلى تقييم المعتقدات الصحية للسيدات تجاه سرطان عنق الرحم. وقد اجريت الدراسة باستخدام التصميم الوصفي في العيادة الخارجية لأمراض النساء والتوليد التابعة لمستشفى بنها الجامعي و تم استخدام عينة عشوائية بسيطة في هذه الدراسة وشملت العينة الإجمالية 351 سيدة. وقد كشفت النتائج ان ما يقرب من ربع السيدات الخاضعات للدراسة كان لديهن مستوى معلومات جيد حول سرطان عنق الرحم وأكثر من خمسي السيدات الخاضعات للدراسة كان لديهن مستوى اعتقاد صحي مرتفع فيما يتعلق بسرطان عنق الرحم. كما اوصت الدراسة انه يجب ابتكار وتنفيذ برنامج تثقيف صحي للسيدات المصريات لتحسين معلوماتهن ومعتقداتهن وممارساتهن الصحية نحو الكشف المبكر عن سرطان عنق الرحم والوقاية منه.