RESEARCH ARTICLE

Application of health belief model about cervical cancer screening among female officer employees in Kafr-El Sheikh university, Egypt.

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Abstract

Objective: To assess the impact of a health educational programme on knowledge and health beliefs of female office workers regarding cervical cancer screening.

Method: The quasi-experimental study was conducted at Kafrelsheikh University, Egypt, from March to September 2021, and comprised all female employees at the university regardless of department or professional status. After baseline assessment using a self-designed questionnaire, an educational session was conducted through small focussed groups having 1-5 participants in their own office environments. Post-intervention change in knowledge and beliefs was assessed using the same questionnaire 1 month after the intervention. Data was analysed using SPSS 22.

Results: Of the total 492 female employees, 360(73.2%) completed the study. Of them, 256(71.1%) were aged 30-40 years, 283(78.6%) were ever-married, 206(57.2%) were from urban communities, 322(89.4%) had university educational, 280(77.8%) had sufficient income, and 214(59.4%) had high socioeconomic status. The mean total scores for knowledge and health beliefs increased significantly post-intervention ($p<0.0001$).

Conclusion: The use of health belief model to change knowledge of and perceptions towards cervical cancer and its screening was found to be effective.

Keywords: Cervical cancer, Uterine, Health, Screening. **DOI: 10.47391/JPMA.EGY-S4-15**

Introduction

Cervical cancer is the third most frequent cancer among females, and it is one of main causes of cancer mortality among women globally.[1] Despite the fact that it is generally preventable, over half-a-million new cases are reported each year around the world.[2] By 2030, the incidence of cervical cancer would have climbed to 730,000 unless action is taken to stop epidemiological trends.[3]

More than 88% of cervical cancer deaths occur in developing countries where gender prejudice and extreme poverty severely limit a woman's ability to seek treatment.[4] According to recent data, 969 Egyptian women are diagnosed with cervical cancer every year, with 631 dying from the disease. Cervical cancer is the 14th most common disease among Egyptian women, and the 11th most common cancer among women between ages 15-44 years.[5]

Cervical cancer screening for early identification of cancer or precancerous lesions can reduce morbidity and mortality. However, enhancing screening services will not result in higher screening uptake unless the complex health beliefs that influence women's willingness to undergo screening are identified and resolved.[6] The Health Belief Model (HBM) is a psychological model intended to explain and predict health-related behaviours, particularly healthcare utilisation.[7-8] The current study was planned to make use of the model in order to assess the impact of a health educational programme on knowledge and health beliefs of female office workers regarding cervical cancer screening.

Subjects and Methods

The quasi-experimental study was conducted at Kafrelsheikh University, Egypt, from March to September 2021, and comprised all female employees at the university regardless of department or professional status. . After permission from the university administration, and approval from the ethics review board of the Faculty of Medicine, Cairo University, Egypt, the study approached all (100%) female staffers and those who agreed to participate were included. Those who refused to participate or were on long leave were excluded.

Baseline data was collected using a self-administered questionnaire in Arabic language. The questionnaire was developed based on extensive literature review,[7-11] then it

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was submitted to three professor experts of different Public Health, Community Medicine and Obstetrics and Gynaecology specialties to assess the questionnaire's face and content validity. The provisional questionnaire was then pilot-tested on 30 women attending the Obstetric and Gynaecology outpatient clinic at the university hospital to assess acceptability, adequacy of the questions and reliability of the questionnaire.

The first section comprised personal and sociodemographic data, including history of cervical or gynaecological cell tumour.

The second section assessed knowledge regarding cervical cancer, including risk factors of cervical cancer (9 items), warning signs (8 items), human papilloma virus (HPV) infection and its vaccine (9 items) and Papanicolaou (Pap) test (9 items).

The third section comprised 27-item HBM scale[9], assessing perceived susceptibility, perceived severity, perceived barriers, perceived benefits, cues to action and self-efficacy.

Socioeconomic status (SES) was determined using a model developed in 1983.[12] The overall score ranged 4-12 points. The total score for SES was considered high at ≥75%, middle at 50-75% and low at <50%. Each item in the knowledge section was scored ''2" for correct answer and ''0" for incorrect and do not know answers. The total score ranged 0-70 points. Each statement in the HBM section was scored on a 3-point Likert scale; Agree, Uncertain and Disagree. Each response was scored 0-2, with 2 given to higher perception except in the perceived barriers part where higher score indicated lower barrier perception. The total score ranged 0-54 points. The total score of knowledge and beliefs was categorised into high at ≥75%, moderate at 50-75% and low at <50%. The scoring classification system was adapted from literature.[13-15]

Based on the needs identified in the assessment phase and in the light of literature[16-18], an educational session was conducted for all study participants in the shape of small focussed groups comprising 1-5 individuals at their offices. The session presented information about cervical cancer, serious consequences, its burden, the causes and risk factors, symptoms and signs, cervical cancer screening, Pap test and its availability, and the importance of HPV vaccination. An educational booklet developed by the researchers in simple Arabic language to suit women's understanding was handed to each participant.

Post-intervention change in knowledge and beliefs was assessed using the same questionnaire 1 month after the intervention.

Data were analysed using SPSS 22. Data normality was tested using Kolmogorov's test. Descriptive statistics were applied and quantitative data was expressed as mean ± standard deviation (SD), and qualitative data as frequencies and percentages. Analytical statistics were applied to compare baseline and post-intervention data using Wilcoxon test for quantitative data. For comparison between groups, Kruskal-Wallis test Mann-Whitney U-test were used, as appropriate, for quantitative variables. Linear regression model was used to predict a dependent variable on the basis of socio-demographic variables which had association in bivariate analysis at $p<0.2$. For all statistical purposes, $p\leq0.05$ was taken as the level of significance.

Results

Of the total 492 female employees, 360(73.2%) completed the study. Of them, 256(71.1%) were aged 30-40 years, 283(78.6%) were ever-married, 206(57.2%) were from urban communities, 322(89.4%) had university education, 280(77.8%) had sufficient income, and 214 (59.4%) had high SES (Table 1).

There mean total knowledge score rose from 19.1±14.7 at baseline to 35.3±9.3 post-intervention ($p<0.0001$). There was highly significant increase in scores of HBM components post-intervention ($p<0.0001$), with the total score increasing from 26.43±6.18 to 37.91±5.52 (Figure).

Table-1: Socio-demographic characteristics of the sample (n=360).

Socio demographic variables		n (%)
Age (ys)	**<30 years**	38 (10.6)
	30-40 years	256 (71.1)
	>40 years	66 (18.3)
Marital status	**Single**	77 (21.4)
	Ever-married	283 (78.6)
Age at marriage(ys)	**<20 years**	7 (2.5)
	20-30 years	255 (90.1)
	>30 years	21 (7.4)
Educational level	**Secondary**	5 (1.4)
	University	322 (89.4)
	Higher	33 (9.2)
Residence	**Rural**	154 (42.8)
	Urban	206 (57.2)
Family income	**Insufficient**	67 (18.6)
	Sufficient	280 (77.8)
	Sufficient and saved	13 (3.6)
Crowding index	**<1**	47 (13.1)
	1-	211 (58.6)
	2-3	102 (28.3)
Total socioeconomic level & score	**High**	214 (59.4)
	Middle	146 (40.6)
	(Mean ±SD)	8.7± 1.2
History of cervical or gynaecological cell tumour		5 (1.4)
Family history of cervical or gynaecological cell tumour		0 (8.3)

SD: Standard deviation.

Table-2: Comparison of total knowledge and health beliefs post-intervention scores in relation to sociodemographic characteristics.

Sociodemographic characteristics		Total knowledge score (n=360)	Total health beliefs score (n=360)
Age	**<30 years**	38.2±4.2	37.4±9.2
	30-40 years	37.8±5.7	35.8±9.4
	>40 years	38.0±5.3	32.2±8.1
	P -value	.936	.007*
Marital status	**Single**	37.8±5.6	34.9±8.9
	Ever-married	38.3±5.4	36.6±10.5
	P -value	.585	.298
Education levels	**Secondary**	36.8±2.9	31.6±8.9
	University	38.1±5.5	34.9±9.1
	Higher	36.6±6.3	39.5±10.4
	P -value	.267	.028*
Age when married	**<20 years**	39.7±5.2	35.1±10.6
	20-30 years	37.7±5.6	35.0±9.0
	>30 years	37.7±5.0	34.1±6.9
	P -value	.706	.960
Residency	**Rural**	37.5±5.5	34.7±9.2
	Urban	38.2±5.6	36.1±9.3
	P -value	.179	.282
Total socioeconomic score	**Moderate**	37.5±5.5	35.9±9.5
	High	38.1±5.5	34.8±9.1
	P -value	.166	.423
Family history cervical cancer	**Yes**	37.99±5.44	35.80±10.04
	No	36.97±6.25	35.25±9.22
	P -value	.178	.952

***Significant.**

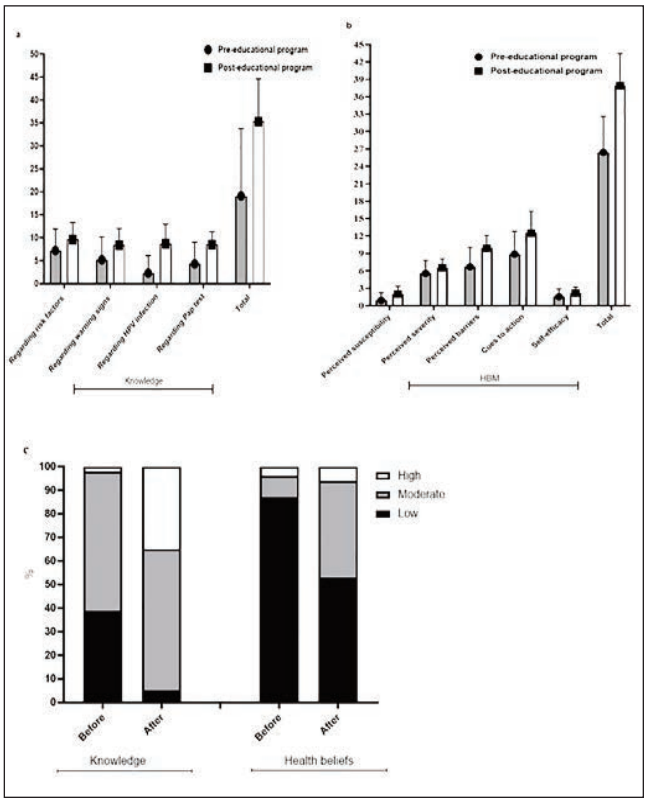

Figure: Comparison of knowledge and Health Beliefs Model (HBM) before and after the intervention, with (a) and (b) showing mean scores and error bars, and (c) showing sub-scores percentage.

Table-3: Linear regression model for predictors affecting total knowledge and health beliefs post-intervention scores .

Variables		Knowledge			
		B	**95% CI**	**Std. Error**	***p-value***
Age	**<30 years**	4.85	(1.14- 8.57)	1.88	.011*
	30-40 years	3.21	(.64- 5.78)	1.30	.014*
	>40 years	Reference	-	-	
Education levels	**Secondary**	-4.69	(-7.46- -.87)	4.54	.013*
	University	-4.17	(-13.62- 4.23)	1.67	.302
	Higher	Reference	-	-	
Intercept	**36.29**	(32.36- 40.22)	1.99	.000*	
			Health beliefs		
Residency	**Rural**	-0.56	(-2.95-1.83)	1.21	.645
	Urban	Reference	-	-	-
Total socioeconomic score	**Moderate**	-0.58	(-2.47-2.35)	1.22	.962
	High	Reference	-	-	-
Family history cervical cancer	**Yes**	.95	(-1.12-3.03)	1.05	.367
	No	Reference	-	-	-
Intercept	**37.29**	(35.21-39.38)	1.06	.000*	

***Significant.**

There were 15(4.2%) subjects with high level of knowledge, 33(9.2%) moderate and 312(86.7%) low at baseline. The corresponding data post-intervention was 22(6.1%), 148(41.1%) and 190(52.8%). Likewise, 5(1.4%) subjects had high level of beliefs, 213(59.2%) had moderate and 142(39.4%) had low at baseline. The corresponding data post-intervention was 125(34.7%), 215(59.7%) and 20(5.6%).

Those aged <30 years and those who had higher educational level scored significant better in terms of belief (Table 2).

Linear regression model for parameters influencing total knowledge and health beliefs showed that age groups and educational level were significant predictors (Table 3).

Discussion

The study showed that in the pre-intervention phase, the majority of respondents had a poor level of knowledge about cervical cancer and screening. These findings are in line with literature.[19,20]

Overall, good and fair knowledge scores significantly increased by 6.1% and 41.1%, respectively post-intervention ($p<0.0001$). A study in Nigeria reported an increase from 2% to 70.5%.[16]

Impact of the intervention demonstrated a significant improvement in all HBM constructs ($p<0.0001$). These findings are supported by other studies.[17-18]

The current study found a significant difference of total knowledge score in terms of age and educational level. A study in Nigeria showed that higher educational status was associated with good knowledge about cervical cancer causes.[21] Moreover, several studies done in Arabic communities showed that higher education predicted higher knowledge scores for symptoms and risk factors of cervical cancer.[22-25]

The current study, the regression model revealed that age and educational status were strong predictors of knowledge scores in the post-intervention phase. A study in the Democratic Republic of Congo reported similar findings.[26] A study conducted in Arab communities showed that younger participants who had higher academic level were more aware about HPV and its vaccine.[27]

The current study was conducted during the coronavirus disease-2019 (COVID-19) epidemic, when social distancing was being in active practice. As such, the intervention had to be delivered individually or in small groups having maximum 5 individuals. Also, due to the epidemic, there was an official decision to reduce the number of employees in all government departments which cause difficulties in the data-collection and intervention process. These circumstances and their consequences may have had an effect on the delivery of health educational sessions, which is a limitation of the study. Besides, the sample size was not calculated which could have affected the power of the study.

Conclusion

The use of HBM to deliver and change knowledge, perceptions towards cervical cancer and its screening practices were found to be effective, showing the potential of the model to be made an integral part of preventive health services related to cervical cancer provided to women in all primary healthcare settings in rural and urban areas.

Acknowledgement: We are grateful to Dr Diaa Abdel Karim Soliman Ibrahim, Clinical Pathology Lecturer at the Al- Azhar University, Egypt, for his help, advice and guidance throughout the study. Thanks are also due to the officials at Kafrelsheikh University.

Disclaimer: None.

Conflict of Interest: None

Source of Funding: None.

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