- *Basic Research*

Effect of Awareness Sessions on Female Nursing Students' Knowledge, Beliefs and Willingness Toward Prevention of Cervical Cancer Through Vaccination

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Abstract

Background: Cervical cancer (CC) is the most obvious malignant tumor among women all over the world. Hence, there is a must for awareness program to encourage and inform students at early ages about risk factors of cervical cancer and the benefits of HPV vaccination, as well as to dispel myths and misconceptions in order to increase their willingness for vaccine uptake. **Aim:** To investigate the effect of awareness sessions on female nursing students' knowledge, beliefs and willingness regarding prevention of cervical cancer through vaccination **Research design**: A quasi experimental pre-post-test design was utilized to achieve the aim of the study. **setting**: This study was conducted at the faculty of nursing Modern University for Technology and Information (MTI). **Sampling:** A purposive sample of 205 nursing students. **Tools**: (I) A) Structured sociodemographic and vaccination B) Pre-post knowledge questionnaire II) Pre-post students' health beliefs mode scale III) pre-post students' willingness scale. **Results**: Showed that, the total good knowledge score level of the nursing students regarding prevention of cervical cancer through vaccination increased from 11.70 % in pre-test to 84.90% in post-test also, the total positive beliefs' score of the nursing students regarding HPV improved from 33.70 % in pre-test to 91.20% in post-test and the total high score of nursing students' willingness to HPV vaccination increased from 8.80 % in pre-test to 76.60 % in post-test, with a highly statistically significant difference. In addition., a significant positive correlation was found between nursing students' total post-knowledge, post beliefs and post-willingness to HPV vaccination. **Conclusion**: The awareness sessions detected an improvement in good nursing students' knowledge, positive beliefs about HPV vaccination and high willingness for vaccine uptake. **Recommendation**: The study recommended that, establishing nationwide educational initiatives vaccination programs, and awareness campaigns for young age students to enhance access to cervical cancer prevention services to help decrease the incidence of the disease and other health conditions related to HPV through HPV vaccination

Keywords: Prevention of cervical cancer, vaccination, awareness sessions, knowledge, beliefs &willingness

Introduction

Cervical cancer is a disease that emerges with abnormal growth of cervical cells in all ages with poor prognosis when diagnosed late. Cervical cancer can be prevented by early detection, treatment, and vaccination against human papillomavirus (HPV) **(Believe et al., 2022).** Dramatically CC ranks as the fourth most widespread cancer among women globally and is the second most prevalent type of cancer in Low and Middle-Income Countries (LMICs) following breast cancer **(Bruni et al., 2023; Kindi et al., 2024).**

Human papillomavirus (HPV) are the main cause of activating the growth of cervical cancer **(Arbyn, et al., 2020**). Human papillomavirus is a common sexually transmitted infection which can affect the skin, genital area and throat. Various strains of HPV are linked to both benign and malignant disorders affecting the anogenital regions and oropharynx moreover., HPV viruses are highly prevalent, and the majority of women worldwide are likely to be infected with at least one type of HPV virus during their sexual lifetime **(Believe et al., 2022)**.

Human papilloma virus vaccination has been proven to be an effective preventive vaccine for HPV infection and subsequently cervical cancer among women who have not yet become sexually active. The HPV vaccine is widely recognized for its high efficacy, immunogenicity, and safety in preventing over 70% of CC cases globally **(Drokow et al., 2021).**The Center of Disease Control and Prevention (CDC) recommends administration of two-doses regimen before reaching the age 15 whenever., three-dose schedule with six months interval between each dose is recommended for individuals who received the first dose after the age of 15 and those who are immune-compromised **(Center of Disease Control and prevention (CDC) , 2022).**

As a result of the high prevalence and mortality rates of cervical cancer in low- and middle-income countries, boosting public awareness and access to information and services are keys for prevention and control across the life course. Secondary school and college students are the target population for being vaccinated so that, it is very important to conduct awareness programs to provide health education and promotion services for the students in order to improve their awareness, changing beliefs as well as recommending them to receive preventive HPV vaccination **(Yin et al., 2021).**

Health Belief Model (HBM) focus on a person's healthy behavior to predict future actions so that, HBM is an appropriate needs assessment model that is very useful for health developers to plan intervention and practices. According to HBM, to accept preventive measures of HPV infection, a person must see the risk of the problem, understand the complexity of the complications, and recognize the benefits of preventive behavior **(Arbyn, et al., 2020).**

Willingness to HPV vaccination depends on certain student’s awareness about the HPV and it’s vaccine, the perception of vaccine uptake, worries regarding the vaccine’s safety, cultural issues concerning having a vaccine for a sexually transmitted virus, and many misconceptions about the HPV infection **(Faris et al., 2021)**. So that., awareness regarding cervical cancer and HPV should be raised by educating people at early age about the benefits of vaccination to overcome this issue.

Significance of the Study:

Worldwide, cervical cancer is the most common cancers in women with an estimated 604,127 new cases and 341,831 deaths in 2020 **(WHO., 2022 & Kindi et al., 2024)**. Persistent infection from oncogenic HPV infection is responsible for more than 90% of cervical cancers globally **(Mullapally et al., 2023)** in addition, the mortality rates of cervical cancer vary widely from

1.6/100,000 in West Asia to 28.6/100,000 in East Africa. With 88% of global burden attributed to low-middle income countries **(Global Cancer Observatory, 2023).**

In Northern Africa, the region that Egypt belongs to, about 3.0% of women are estimated to harbor cervical HPV-16/18 infection at a given time. According to Information Centre on HPV and Cancer (ICO), cervical cancer ranks as the 13th most frequent cancer among women in Egypt and the 9th most frequent cancer among women between 15 and 44 years of age. Yearly in Egypt, unfortunately approximately 1320 women are diagnosed with cervical cancer and the mortality rate from the disease is about 744 women (**Bruni et al., 2023).**

Vaccines against HPV have been found to be the most effective method in preventing cervical cancer. In addition., young adults have a high prevalence of genital HPV infection due to their risky sexual behavior, lack of awareness of HPV infection, HPV vaccination and misconception about susceptibility **(Van Dang & Phuong, 2024).**Therefore, the present study used to improve female nursing students' knowledge, believes and willingness for vaccination in order to protect themselves against HPV and cervical cancer and also to spread their awareness to their families, relatives and future patients.

Aim of the Study:
The study aimed to investigate the effect of awareness sessions on female nursing students' knowledge, beliefs and willingness regarding prevention of cervical cancer through HPV vaccination.

Research Hypothesis:
H1: Awareness sessions will improve nursing students' knowledge regarding prevention of cervical cancer through HPV vaccination.
H2: Awareness sessions will improve nursing students' belief regarding prevention of cervical cancer through HPV vaccination.
H3: Awareness sessions will improve nursing students' willingness regarding prevention of cervical cancer through HPV vaccination
H4: There will be a significant positive correlation between nursing students' knowledge, beliefs and willingness regarding prevention of cervical cancer through HPV vaccination.

Subjects and Methods
Research Design: A quasi-experimental design was utilized to conduct the study.
Setting: This study was conducted at the faculty of nursing Modern University for Technology and Information (MTI).

Study subjects: The sample size was calculated by using EPI info7software based on the total population of 439 female nursing students enrolled in the first academic year (201 students), second academic year (100 students), third academic year (83 students) and at the fourth academic year (55 students). The estimation was expected with an acceptable error of 5% and confidence limit of 99%. The calculation resulted in target sample size of 205 female nursing students.

Stratified proportional random sample technique was adopted according to total number of female nursing students in each academic year. So that., the target number of female nursing students were:

Academic year	No. of students
First academic year	93
Second academic year	46
Third academic year	38
Fourth academic year	28
Total students	205

Tools of data collection: Three tools were used in the present study as follows:

Tool I: Nursing Students' Interview Questionnaire

Structured sociodemographic data: to assess nursing students sociodemographic characteristics as age, academic year, previous education, marital status, monthly income, vaccination against HPV and attendance of training program about prevention of cervical cancer through HPV vaccination.

a) **Nursing students' knowledge questionnaire:** Pre-post knowledge questionnaire was adapted by the researchers after reviewing of related literatures such as **(Ran et al., 2022 & Seemann et al., 2023)** to assess female nursing students' knowledge regarding cervical cancer (6 items) human papilloma virus infection (6 items) and HPV vaccine (6 items).
b) **Scoring system:** Responses to each question was scored as (1) for "correct answer" and (0) for "incorrect answer", the total score was calculated by the sum of correct answers and converted into a percent to be categorized into:
    - Good total knowledge level if scores were ≥ 75% (≥13 marks).
    - Average total knowledge level if scores were 50%-75% (9-12 marks).
    - Poor total knowledge level if scores were <50% (<9 marks).

Tool II: Students' health beliefs model about HPV vaccination: Pre-post nursing students' beliefs scale toward HPV vaccination was adapted from **(Aldohaian et al., 2019, El-Sayed et al., 2020 and Mohammed & Sayed 2022)** for assessing nursing students' beliefs regarding HPV vaccination including 28 items using three points Likert scale translated into Arabic language and divided into five main dimensions: perceived susceptibility (5items), perceived severity (8items) and perceived barriers (4items) perceived benefits (5items) and perceived cues of action (6 items).

Scoring System: Each statement was scored as (3) for agree, (2) for neutral and (1) for disagree, the total score was calculated by the sum of each statement and converted into a percent to be categorized into:

- Positive total beliefs if scores were ≥ 60% (≥50 marks).
- Negative total beliefs if scores were <60% (<50 marks).

Tool III: Nursing Students' willingness for HPV vaccination: Pre-post nursing students' willingness scale toward HPV vaccination was adapted from **(Liu et al., 2020, You et al., 2020 & Si et al., 2022)** to measure students' willingness to receive HPV vaccinations including ten items measured using three points Likert scale translated into Arabic language.

Scoring System:
Each statement was scored as (3) for agree, (2) for neutral and (1) for disagree, the total score was calculated by the sum of each statement and converted into a percent to be categorized into:

- High willingness if scores were ≥ 70% (≥21 marks).
- Moderate willingness if scores were 50%-70% (15-20 marks).
- Low willingness if scores were ≤ 50.0% (<15 marks).

Validity and Reliability: The knowledge questionnaire, beliefs and willingness scales were revised by a group of five professors in medical surgical nursing and Obstetric and gynecological nursing to assess the validity of content. Also, reliability of tools was tested by Cronbach's Alpha test and proved the homogeneous of items. The total scores of knowledge, beliefs and willingness were acceptable ranging from .642 for willingness, .789 for knowledge and .922 for beliefs.

Ethical considerations: It was approved by the Research Ethics Committee at Faculty of Nursing - Modern University for Technology and Information (MTI), Cairo, Egypt before the beginning of the actual work. Students were informed about the aim, significance and process of the study. Students also were informed about their right to refuse participation in the study and confidentiality was assured for all information provided. Then verbal approval was obtained from each student who agreed to participate before inclusion in the study as well as students were informed about the right to withdraw from the study at any moment.

Field Work: Data were collected through four months from the beginning of April 2024 to the end of August 2024. Pre-test data were collected using google form over one month. The awareness sessions prepared over one month. As well as one month for the online awareness sessions' implementation then one month for post-test data collection using the previously used google form.

Awareness sessions Construction: The awareness sessions aimed to improve female nursing students' knowledge, beliefs and willingness toward prevention of cervical cancer through HPV vaccination. The awareness sessions were planned and designed in four phases as following:

Preparatory phase: A pilot study was carried out on 20 nursing students before starting the actual data collection to test the applicability and clarity of the items included in the adapted part of the data collection tool. Also, to estimate the time needed to complete the questionnaire, and to add or omit items. Accordingly, no modification was needed and the time to answer the sheet was estimated to be from 15-20 minutes.

Assessment phase: Researchers conducted initial assessment through making whats' app group and add all nursing students who participated in the study then sending them pre-awareness sessions google form to assess sociodemographic characteristics, clinical data, and baseline students' level of knowledge, beliefs and willingness to prevention of cervical cancer through vaccination, using tool I, II, and III. A simple introduction about the aim and duration of the study was done. Based on the pre-test results, the awareness sessions were constructed. The awareness sessions main objective was to improve the female nursing students understanding of prevention of cervical cancer through vaccination and to improve their beliefs and willingness to HPV vaccination in order to minimize their risk for cervical cancer. The sessions were planned to be conducted online through Zoom meeting using a variety of online teaching methods as; lectures, group discussion and brain storming. Also, different online

audiovisual aids such as; sharing pictures, posters, videos and power point presentations and handout were utilized.

Implementation phase: was carried out for all the study participants through three online sessions over a month. The content of the awareness sessions was covered into three sessions as a follow:
1st session: includes basic knowledge about cervical cancer definition, types, causes, risk factors, manifestations, diagnosis and different treatment modalities.
2nd session: cover information about HPV, types of HPV, risk factors for acquiring HPV infection, mode of transmission of HPV, Manifestations of HPV, diagnosis of HPV, complications and treatment of HPV infection.
3rd session: Handle all knowledge about HPV vaccination in order to improve nursing students' beliefs and willingness to HPV vaccine uptake to prevent CC including information about (definition of HPV vaccine, advantages of HPV vaccine, types of HPV vaccine, doses of HPV vaccine, side effects of HPV vaccine and availability of HPV vaccine in Egypt).

Evaluation phase: was done firstly through the pre-test before the program conduction, then immediately after completing awareness session in order to evaluate the impact of the awareness sessions on nursing students' knowledge, beliefs and willingness toward prevention of cervical cancer through HPV vaccination.

Statistical Analysis: SPSS version 27.0 was used in data entry and statistical analysis. Presenting of qualitative variables were in frequency & percentage. Quantitative variables were presented in mean & standard deviation. The normality of study variables was assessed by using Kolmogorov Smironov test. Paired sample t- test was used in testing the differences of parametric variables for nursing students' knowledge, beliefs and willingness toward prevention of cervical cancer through vaccination and also for all related domains. Correlation among qualitative variables were tested by using Pearson correlation coefficient for nursing students' knowledge, beliefs and willingness. The correlation between nursing students' sociodemographic data and knowledge & beliefs and willingness that could assess the predictors was tested by linear regression fitting model.

Results

Table (1): reveals that., the mean age of nursing students was 21±28 with median age equal 21 years old and Min-Max age between 18-27 years old. The 1st grade nursing students represent the highest percentage (45.4%) of the sample moreover., (73.2%) of nursing students admitted to the faculty after secondary school. Concerning marital status., the current table shows that the highest percent of the sample (89.3%) were single in addition., (51.7%) of them had monthly income 6000<10000. The current table also illustrates that., almost all of studied nursing students didn't have previous vaccination against HPV or attend any training program about prevention of cervical cancer through HPV vaccination.

Table (2): Table (2) detects that., there were a highly statistically significant difference between nursing students' total knowledge classifications about prevention of cervical cancer through vaccination as evidenced that., the mean nursing students' knowledge about HPV and HPV vaccination was 3.448±.842 & 1.62±1.514 pre-educational session which improved to 5.497±.905 & 5.239±1.174 post educational sessions respectively.

Figure (1): displays that, there was an increase in the total good knowledge score level regarding prevention of cervical cancer through vaccination from 11.70 % in pre-test to 84.90% in post-test, with a highly statistically significant difference at p-value (< 0.000**).

Table (3): detects that., there was a highly statistically significant difference between nursing students' total beliefs classifications about HPV vaccination as evidenced that, there beliefs regarding (perceived susceptibility, perceived severity, perceived barriers of receiving vaccine, perceived benefits of receiving vaccine and cues of action as the mean score were 8.322±2.974, 13.517±4.814, 5.390±1.104, 10.009±2.098, & 9.287±1.855 at pre-test which improved to 11.144±2.190, 18.209±3.976, 10.014±1.895, 13.507±1.661 & 15.482±2.565at post-test respectively.

Figure (2) reflects increasing in the total positive beliefs score level of the nursing students regarding HPV from 33.70 % in pre-test to 91.20% in post-test with a highly statistically significant difference at p-value (< 0.001**).

Table (4): indicates that there was a highly statistically significant difference between nursing students' willingness to receive HPV vaccination items as evidenced that., the mean nursing students' Willingness to take the HPV vaccine, willingness to encourage colleagues to take the HPV vaccine and thinking about the necessity of receiving all recommended doses to prevent HPV infection was 1.331±.511, 1.346±.476& 1.365±.531 pre-test which improved to 2.580±.625, 2.507±.615& 2.624±.602 post-test respectively.

Figure (3) represents increasing in the total high score of nursing students' willingness to HPV vaccination from 8.80 % at pre-test to 76.60 % in post-test, with a highly statistically significant difference at p-value (0.000**).

Table 5: using the linear regression model for assessing the association between post-knowledge, post-beliefs & and post-willingness of nursing students and their sociodemographic data clarifies a significant correlation between nursing students' post-knowledge regarding prevention of cervical cancer through vaccination and their age and marital status, moreover., nursing students' predictors (age, grade, previous education, marital status and income) affect total knowledge score by 11.0%. Additionally, this regression model reveals that 7.3% of these predictors affect the total mean score of nursing students' beliefs regarding HPV vaccination and there was significant association between nursing students' total-post beliefs and predictor of marital status. This table also illustrated that., nursing students' predictors affect total- post willingness by 9.3% with significant correlation between total-post willingness and their (age & marital status).

Table (6) reveals that., there was a highly statistically positive correlation between nursing students' total post-knowledge, post beliefs and post-willingness (r=232**, .425** & .181**).

Table (1): Distribution of nursing students' socio-demographic and their experience regarding prevention of cervical cancer through HPV vaccination (n=205):

Socio-demographic data and nurses' experience	No.	%
Age (years): Mean±SD Median Min-Max	21±282 21.000 18-27	
Academic year		
1st grade	93	45.4
2nd grade	8446	22.4
3rd grade	4338	18.5
4th grade	3028	13.7
Previous education		
Secondary school	150	73.2
technical nursing institute	55	26.8
Marital status		
Single	183	89.3
Engaged	13	6.3
Married	9	4.4
Monthly income		
3000<6000	30	14.6
6000<10000	106	51.7
10000≥	69	33.7
Vaccination against HPV		
Yes	0	0.0
No	205	100.0
Attendance of training about prevention of cervical cancer through HPV vaccination		
Yes	0	0.0
No	205	100.0

Table (2): Distribution of nursing students regarding their knowledge about prevention of cervical cancer through vaccination (n= 205):

Knowledge classifications	**Pre**	**Post**	**Paired t test**	**p-value**
	$\bar{x}$ ±SD	**$\bar{x}$ ±SD**		
Students' knowledge about cervical cancer	3.092±1.440	5.317±.940	23.985	0.000**
Students' knowledge about HPV infection	3.448±.842	5.497±.905	29.515	0.000**
Students' knowledge about HPV vaccination	1.624±1.514	5.239±1.174	33.039	0.000**
Total	8.1854±2.966	16.053±2.351	40.411	0.000**

Fig (1): Pre-post total knowledge score level of nursing students regarding prevention of cervical cancer through vaccination (n=205):

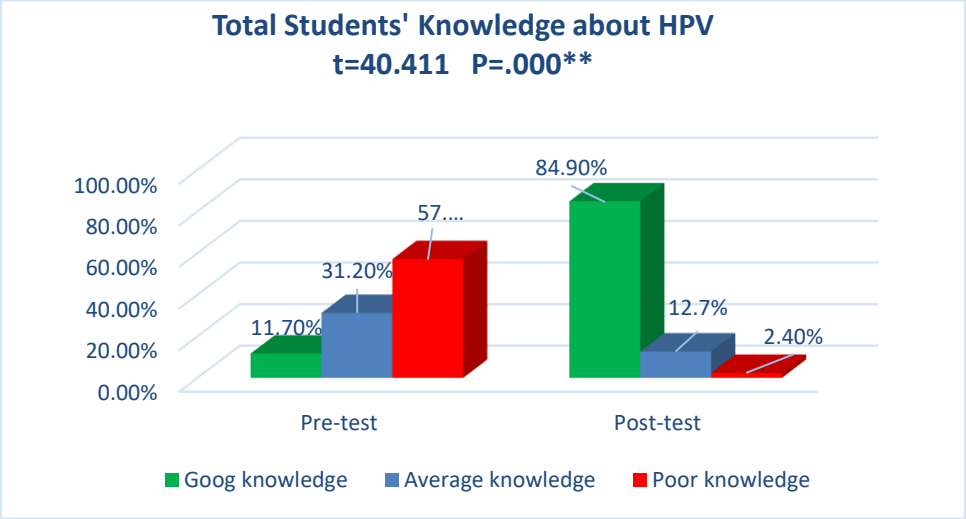

Table (3): Distribution of nursing students regarding their beliefs about HPV vaccination (n= 205):

Beliefs classification	Pre	Post	Paired t-test	p-value
	x̄ ±SD	x̄ ±SD		
Perceived susceptibility	8.3222±2.9743	11.144±2.190	12.545	0.000**
Perceived severity	13.517±4.814	18.209±3.976	12.342	0.000**
Perceived barriers to receiving the vaccine	5.390±1.104	10.014±1.895	30.652	0.000**
Perceived benefits of receiving the vaccine	10.009±2.098	13.507±1.661	22.649	0.000**
Perceived cues of action	9.287±1.855	15.482±2.565	29.048	0.000**
Total beliefs	46.522±10.008	68.356±9.442	26.483	0.000**

Fig (2): Pre-post total beliefs score level of nursing students regarding HPV vaccination (n=205):

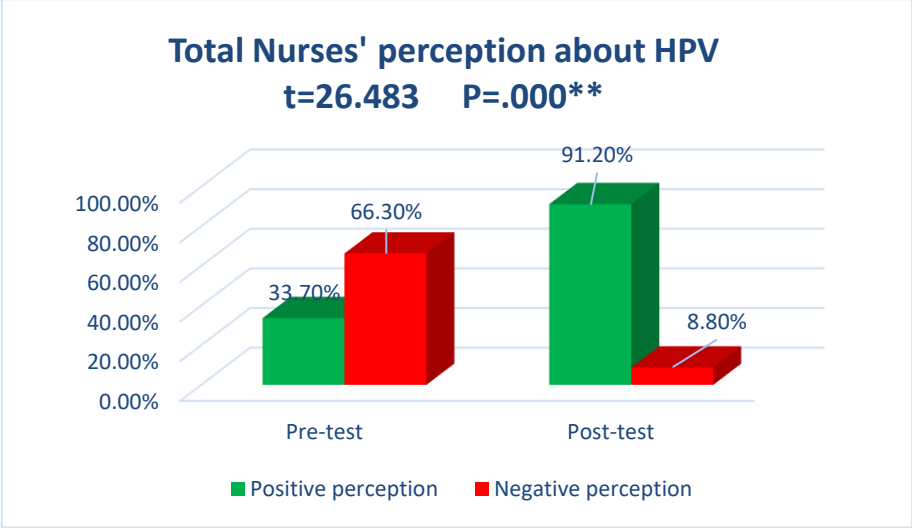

Table (4): Distribution of nursing students regarding their willingness for HPV vaccination (n= 205):

Willingness items	Pre	Post	Paired t-test	p-value
	x̄ ±SD	x̄ ±SD		
Believing that, protection is better than cure	1.4000±.491	2.634±.549	25.143	0.000**
Willingness to take the HPV vaccine	1.331±.511	2.580±.625	21.559	0.000**
Willingness to encourage colleagues to take the HPV vaccine	1.346±.476	2.507±.615	20.233	0.000**
Willingness to encourage relatives to take the HPV vaccine	1.307±.503	2.468±.630	21.011	0.000**
Talking to the family about getting the HPV vaccine	1.336±.522	2.468±.606	20.663	0.000**
Talking to the future husband about taking the HPV vaccine	1.282±.451	2.453±.613	25.094	0.000**
Thinking that all gynecologists should recommend the vaccine to their patients	1.897±.597	2.629±.609	11.895	0.000**
Believing that, the HPV vaccine is no different from other vaccines that protect against serious diseases	1.624±.458	2.624±.594	19.323	0.000**
Having faith in the effectiveness of the vaccine and the stability of immunity provided by the vaccine	1.673±.519	2.614±.604	17.064	0.000**
Thinking about the necessity of receiving all recommended doses to prevent HPV infection	1.365±.531	2.624±.602	22.993	0.000**
total	14.568±2.485	25.604±4.646	30.292	0.000**

Fig (3): Pre-post total willingness score level of nursing students regarding prevention of cervical cancer through vaccination (n=205).

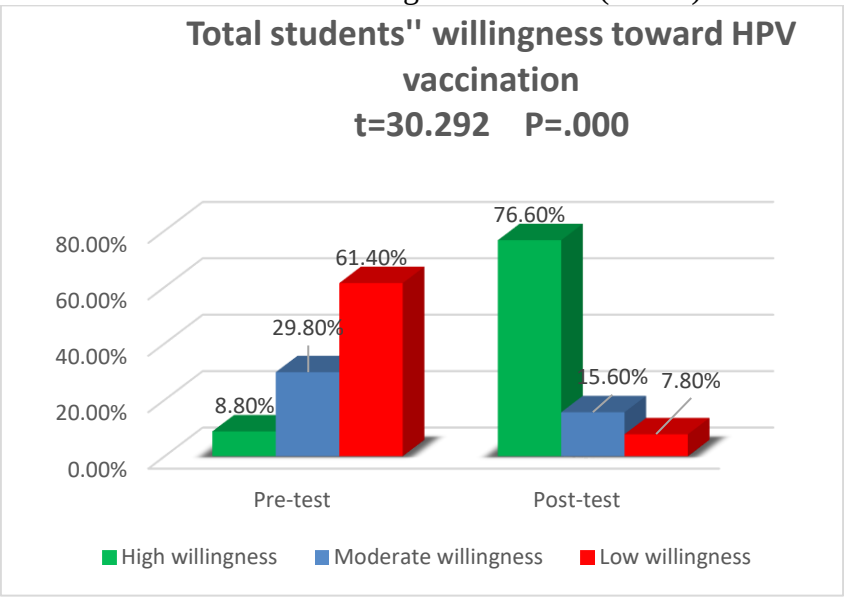

Table (5) Linear regression model in association between nursing students' total post-knowledge, post-beliefs & post-willingness score and their socio-demographic data

Dependent variables	predictors	Unstandardized coefficients		Standardized coefficients	F	T	Sig.	R-square
		B	Std. Error	Beta				
Total -post knowledge	**(Constant)**	2.843	.126		4.923	22.624	.000	0.11
	Age (yrs.)	-.106-	.048	.255		2.223	.027	
	Grade	-.014-	.041	-.036		-.353	.725	
	Previous education	.051	.104	.052		.496	.620	
	Marital status	-.270	.067	.-.286		-4.057	.000	
	Income	.008	.031	.019		.272	.786	
Total-post beliefs	**(Constant)**	.910	.083		3.114	11.023	.000	0.073
	Age (yrs.)	.038	.031	.141		1.200	.232	
	Grade	-.007	.027	-.027		-.259	.796	
	Previous education	.092	.068	.068		1.352	.178	
	Marital status	-.108	.044	.044		-.2.460	.015	
	Income	-.024	.020	.020		-1.166	.245	
Total-post willingness	**(Constant)**	2.591	.167		4.012	14.739	.000	0.092
	Age	.127	.076	.300		2.584	.010	
	Grade	.029	.057	.051		.502	.616	
	Previous education	.056	.145	-.041		.386-	.700	
	Marital status	-.216	.093	-.165-		-2.320	.021	
	Income	-.009	.043	-.014		-.202	.840	

Table (6): Post-test correlation matrix between nursing students' total knowledge about prevention of cervical cancer through vaccination and their beliefs and willingness regarding HPV vaccination.

Scale	Post-test nurses' willingness		Post-test nurses' beliefs
Post-test nursing students' knowledge	r	.232**	.425**
	p	0.000**	0.000**
Post-test nursing students' beliefs	R	.181**	
	p	0.000**	

Discussion

Currently, vaccines against HPV have been found to be the most effective known method in preventing cervical cancer among women who have not previously been exposed to HPV. However, several studies have found that early detection is disrupted by poor knowledge, incorrect behaviors and beliefs related to cervical cancer screening which may have an important impact on the women's decision to practice preventive measures against cancer of the cervix such as willingness for HPV vaccine uptake **Van Dang & Phuong, 2024)**

Egypt lacks a national HPV vaccination program, despite the association between HPV infection and CC. Students' awareness of CC and associated benefits of HPV vaccination are crucial for early identification and prevention **(Bruni et al., 2023).** The role of health education in creating cancer awareness cannot be overemphasized. The quality of health education programs delivered for students in early age can improve the health and well-being of students and improve their awareness about dangerous diseases. Additionally, enhance their participation in healthy behaviors such as vaccine uptake Thus, our study was conducted to establish awareness sessions about prevention of CC through vaccination and evaluate its effect on students' knowledge, beliefs and willingness for HPV vaccine uptake.

Concerning nursing students' mean knowledge score regarding cervical cancer, HPV infection and HPV vaccination, the present study declared that, there were highly statistically significant increase in the mean nursing students' knowledge score from 3.092±1.440, 3.448±.842 & 1.62±1.514 pre-educational sessions to 5.317±.940, 5.497±.905 & 5.239±1.174 post educational sessions respectively. From the researchers' point of view, this might be due to the effect of educational sessions in raising students' awareness through illustrating the danger of HPV infection and the valuable information about the importance of HPV vaccination to reduce the risk of cervical cancer also might be due to the effect of educational session on illustrating the risk factors and complications of cervical cancer to motivate participants to gain and retain knowledge.

The present study was in the same line with **Abdelhafez, et al., (2024) who conducted** quasi-experimental design at Assiut University, Egypt to assess the effect of the educational program on knowledge and preventive practices regarding cervical cancer screening and human papillomavirus vaccine and demonstrated a highly statistically significant difference between mean general knowledge about cervical cancer from 2.85±3.355 pre-test and improved to 8.556±2.987 post-test, also, there was a significant improvement in participants mean knowledge about HPV and HPV vaccination from 2.437±3.413 pre-test to 9.207±3.129 post-test.

Also., the study was congruent with **Mbulawa et al., (2021)** who conducted a cross-sectional study among high school learners in Eastern Cape, South Africa to assess HPV infection and associated risks knowledge level among learners attending high schools and concluded that, before intervention, the minority of learners ever heard about HPV and that HPV infection is sexually transmitted and associated with cervical cancer development and minimal number of them knew about HPV vaccination whenever, after the intervention participants' knowledge about cervical cancer, HPV and HPV vaccination increased significantly to about two thirds of them had a good knowledge post intervention.

On the other hand, the study was incongruent with **Musella et all., (2024)** who conducted a study in Federico II" University, Naples, Italy to carry out a knowledge, attitude and beliefs survey on HPV infection, and HPV vaccination among Italian dental students and illustrated that, the baseline knowledge of studied participants illustrated that, the highest percentage of about three quarters of students had correct answers concerned knowledge of the vaccine, followed by less than three quarters had correct knowledge about HPV infection items.

The current study displayed a significant increase in the total good knowledge score level of the nursing students regarding prevention of cervical cancer through vaccination as evidenced by, the minority of nursing students had a good total knowledge pre-test which improved to the majority of them had a good total knowledge post-test, with a highly statistically significant difference at p-value (< 0.000**). From the researchers' point of view, this might be due to the positive effect of well-prepared, comprehensive, attractive and illustrative educational materials in raising students' awareness and also the researchers focusing on showing the risk and complications of HPV infection and subsequently, the importance of cervical cancer prevention through vaccination.

The result of the current study was agreed with a quasi-experimental study carried out by **Somera et al. (2023)** on a cohort of university students in the U.S to assess the influence of educational program on college students' knowledge and awareness regarding prevention of cervical cancer through vaccination and revealed that educational intervention proved to be a successful method for enhancing students' total awareness level as the study declared that, prior to the sessions, about two thirds of the participants were unknowledgeable whenever, after the presentation, this score decreased to minority of them.

Similarly, the study was congruent with a quasi-experimental study by **Hassan et al., (2022)** to evaluate the Effect of nursing guideline about genital Human papilloma virus infection on beliefs of female university students at Faculty of nursing in Alexandria University who surmised that nursing guideline efforts were appropriate for the target audience as the minority of studied students had a satisfactory total knowledge pre-program which increased to most of them had a satisfactory total knowledge post-intervention and slightly declined at 6 months follow-up with statistically significant difference.

The resemblance between the current study and previous studies findings in improvement of respondents' knowledge might be explained by similarities in educational materials, selecting similar age groups and selecting sample interested in the studied topic.

Whereas in a study by **Dedey et al., (2024)** who performed a quasi-experimental study aimed to assess the impact of cervical cancer education in two high schools in Ghana found that sample already had knowledge even before the intervention.

Concerning the total beliefs of studied nursing students regarding prevention of cervical cancer through vaccination, the current study reflected an increase in the total positive beliefs score

level of the nursing students from one third of students had positive beliefs at pre-test to most of them had positive beliefs post-test, with a highly statistically significant difference at p-value (< 0.001**).From the researchers point of view, this might be due to well- designed, well-resourced and sustained health education that increase the awareness and motivation of the students. As wells as, illustrating that maintenance of health and well-being through prevention of disease is very important to promote positive health beliefs among students.

The study was similar to **Mohammed & Sayed, (2022)** who performed a quasi-experimental study on a purposive sample of 100 school age participants at Beni-Suef city to assess the effect of the health belief model in preventing and controlling cancer risk behaviors among school age students and indicates that, highly statistically significant difference was found between pre, post and follow up the program intervention the mean total score of students' beliefs about controlling cancer risk behavior was 80.03±3.18 pre- intervention which improved to 163±5.70 post intervention and 153±7.61 at follow-up intervention.

In addition., the study was congruent with **Poudel et al., (2021)** who conducted a non-randomized study- control design among 313 pairs of adolescent students in Lalitpur, Nepal to test the effectiveness of cancer education based on a new model among high schoolers. The baseline results showed that there was an increase in knowledge and health beliefs among students in traditional lecture groups and intervention group post the education program.

Moreover, the study was supported by **Ebrahim et al., (2021)** who indicated that the nursing students improved their total beliefs immediately post-program with a highly significant difference as evidenced by the minority of students had positive health beliefs pre-intervention which improved to about two thirds of them had positive beliefs immediately post intervention.

In relation to nursing students' total willingness to receive HPV vaccination, the current study showed a significant improvement as the minority of nursing students had high willingness pre-educational sessions and improved to more than three quarters of them post educational sessions, with a highly statistically significant difference. The significant increase in participants willingness and intention to receive HPV vaccination might be due to the improvement in students' awareness and beliefs about perceived seriousness, susceptibility and complications of HPV infection and the importance of HPV vaccination increased students' intention and willingness to vaccine uptake.

The study was approved by **Abdelhafez et al., (2024)** who indicated that the minority of participants expressed an intention to receive the HPV vaccine pre-intervention which increased to nearly three quarters of them post- intervention, demonstrating a highly statistically significant difference.

Also., the study was in accordance with **Zomordi et al., (2022)** who conducted a controlled educational trial of study and control group to determine the effect of education based on the theory of planned behavior (TPB) on the intention of vaccination against HPV in female Mashhad University of Medical Sciences, Iran and illustrated that, the mean score of vaccination intention was higher in the intervention group 12.2±1.3 compared with the control group 12.3±1.2.

On the other hand., the study was contradicted by **Zhang et al., (2022)** who conducted a descriptive study in four universities in Zhengzhou, China to identify the factors that influence the knowledge of cervical cancer prevention and treatment after adjusting for confounders among college students and indicated that, nearly three quarters of college students had heard about HPV vaccine, and most students expressed their willingness to get the vaccine and

recommend their family members and friends for vaccination indicating that students have a high willingness to vaccine uptake.

The post-test results of linear regression model illustrated that, nursing students' total knowledge affected by predictors as (age, grade, previous education, marital status and income) whenever., there was a significant correlation between nursing students' post- knowledge and their age and marital status. This could be interpreted that as age increase, students' ability to acquire and retain knowledge become more and also, being married or engaged increase student motivation to obtain knowledge.

The study was in accordance with a cross-sectional study by **Indracanti et al., (2021)** aimed to understand the factors associated with HPV and cervical cancer awareness levels among male and female students from Tewodros and Maraki campuses. Multivariate logistic regression analyses were performed to identify variables that were associated with the knowledge and revealed that, the overall cervical cancer knowledge was strongly associated with age.

The study was also supported by **Bekele et al., (2022)** who conducted a descriptive study was conducted using a multistage sampling technique among 730 female college students in Eastern Ethiopia. Binary logistic regression were used to and illustrated that, age group were significantly associated with knowledge of cervical cancer screening.

The study was contradicted with **Zhang et al., (2022)** who carried out a logistic regression analysis between total knowledge level about cervical cancer prevention and treatment and the gender, grade, and place of household registration, level of education, mean monthly consumption level. The results showed that grade and level of education were found to be the independent predictors of the knowledge of cervical cancer prevention and treatment.

Regression model also identified that, sociodemographic variables such as (age, grade, previous education, marital status and income) affect the total mean score of nursing students' beliefs regarding HPV vaccination and there was significant association between nursing students' total-post beliefs and predictor of marital status.

The study was congruent with **Al-Ani et al., (2024)** A systematic literature carried out using the PubMed/ MEDLINE, Cochrane/CENTRAL, and Web of Science databases to examine the utility of the health belief model (HBM) and other socioeconomic factors in shaping cervical screening behaviors and factors associated with cervical screening and revealed that marital status associated with altering beliefs and preventive behaviors toward cervical cancer.

Concerning the association between nursing students' total willingness and sociodemographic data, the post-test findings of linear regression model demonstrated a significant association between overall nursing students' willingness and their sociodemographic predators as (age, grade, previous education, marital status and income). in addition., there was a significant correlation between nursing students' willingness regarding HPV vaccination at post-test and their age and marital status meanwhile., predictors such as grade previous education and income didn't affect students' willingness for HPV vaccination.

The explanation for these associations could be that those that are young age are less exposed to the infection risk and consequently they think themselves to be at lower risk while, in contrast, as age increases, the prevalence of the infection increases. So that, older are more knowledgeable about the importance of the vaccination so that, they are more willing to vaccine

uptake in addition, the marital status or being engaged increase the students' intention and willingness to be vaccinated.

The study was supported by, **Almatrafi et al., (2024**) conducted a quasi-experimental design conducted on secondary schools students in Saudi Arabia with objectives of assessing the effectiveness of the educational program in enhancing students' understanding of HPV vaccine, correcting misconceptions, and increasing overall awareness and willingness to be vaccinated against HPV. logistic regression analysis identified various factors such as age and knowledge were related to students' willingness to vaccine uptake.

The study was also in agreement with the multivariate logistic regression analysis by **Di Giuseppe (2023)** across sectional study conducted in southern Italy's students to evaluate knowledge, attitudes, and behaviors toward HPV infection and vaccination and indicated that several socio-demographic and general characteristics, such as age and sexual relation were independently identified as significant determinants that affects HPV vaccination uptake.

Post-test correlation matrix presented a highly statistically significant correlation between nursing students' total knowledge about prevention of cervical cancer through vaccination and their beliefs and willingness regarding HPV vaccination (r=.232**, r=.425** & .181**). From the researchers' point of view, this could be attributed to the fact that improved knowledge is in turn improving beliefs and willingness to vaccination and vice versa, as it provided the participants with valuable information that can affect their health beliefs and preventive behaviors and their intention for vaccine intake.

The study was supported by **Ebrahim et al., (2021)** who implemented quasi-experimental design (pre and posttest) at faculty of nursing, Benha University, Egypt to evaluate the effect of the educational package based on health belief model on nursing students' knowledge and attitude regarding human papilloma virus and cervical cancer and clarified that there was a highly positive statistical correlation between total knowledge, total attitude regarding HPV vaccine uptakehan and total HBM scores regarding cervical cancer and human papilloma virus at pre and immediate post intervention and four weeks post-intervention phases($p<0.001$).

Surprisingly, a negative association between knowledge level of HPV and intention to be vaccinated was unexpectedly found by study carried out by **Wang et al., (2023)** who designed a quasi-experimental study on young women to investigate how HPV related information exposure and injunctive norms affect the intention of vaccination against human papillomavirus in female students. The study speculated that this result might be related to public concerns about vaccine safety issues and the high price of HPV vaccine in China decrease their intention to be vaccinated. The difference might be due to lack of confidence in vaccine efficacy and safety concerns results in vaccine refusal.

Conclusion:

After the awareness sessions conduction, researchers detected the improvement in the good nursing students' knowledge regarding prevention of cervical cancer through vaccination also, there is a significant increase in positive beliefs toward HPV vaccination and the willingness to be vaccinated. The result also showed a strong positive correlation between nursing students' knowledge, beliefs and willingness regarding prevention of cervical cancer through vaccination. The current study could serve as a useful guide to improve future implementations and policies with regards to improvement in HPV vaccination uptake, increase awareness of HPV infection and reduce the morbidity and mortality from cervical cancer.

Recommendations:

In the light of the result of the present study, the following recommendations are suggested:

- Establish nationwide educational initiatives, vaccination programs, and awareness campaigns to enhance access to CC prevention services for young age students will help prevent CC and other health conditions related to HPV and remove obstacles to HPV vaccination.
- Enhance propagation of awareness program based on HBM on cancer risks prevention on a large sample population illustrating the importance of completing the recommended vaccination doses would help take action for cancer prevention.
- There is a need for a public education program with wider samples of all different ages allover Egypt and for developing health education initiatives for women to improve their knowledge, beliefs about cervical cancer to dispel myths and misconceptions.
- More rigorous research focuses on educating women with information to explore the long-term effects of cervical cancer and plan an individualized educational system for early detection and prevention to enhance uptake of cervical cancer.

References

1. Abdelhafez, M., Kawi, F., Mohamed, H., Ismail, M., & Ibrahim, H. (2024). Effect of Educational Program on Knowledge and Preventive Practices Regarding Cervical Cancer Screening and Human Papillomavirus Vaccine among Childbearing Women. Tanta Scientific Nursing Journal, 34(3).
2. Al-Ani, A., Hammouri, M., Sultan, H., Al-Huneidy, L., Mansour, A., & Al-Hussaini, M. (2024). Factors affecting cervical screening using the health belief model during the last decade: A systematic review and meta-analysis. Psycho-Oncology, 33(1), e6275. https://doi.org/10.1002/pon.6275.
3. Aldohaian, A.I., Alshammari, S.A. & Arafah, D.M (2019). Using the health belief model to assess beliefs and behaviors regarding cervical cancer screening among Saudi women: a cross-sectional observational study. BMC Women's Health 19, 6 (2019). https://doi.org/10.1186/s12905-018-0701-2
4. Almatrafi S, Kamel S, Algarni D, Almatrafi S, Aledrisi MK, Algarni MD, Alsalami A, Alrashidi M (2024). The Impact of an Educational Program on the Awareness and Knowledge of Human Papilloma Virus (HPV) Vaccine Among Secondary School Girls in Saudi Arabia. Cureus. Jul 19;16(7):e64957. Available at https://doi: 10.7759/cureus.64957. PMID: 39161480; PMCID: PMC11331014.
5. Arbyn M, Weiderpass E, Bruni L., (2020): Estimates of incidence and Mortality of cervical cancer in 2018: a worldwide analysis. Lancet Glob Health 2020; 8(2):e191–e203. Availableat http://dx.doi.org/10.1016/s2214-109x(19)30482-6
6. Bekele HT, Nuri A, Abera L (2022). Knowledge, Attitude, and Practice Toward Cervical Cancer Screening and Associated Factors Among College and University Female Students in Dire Dawa City, Eastern Ethiopia. Cancer Informatics. 2022;21. doi:10.1177/11769351221084808
7. Believe, O., Omosivie, M., Soter, A. & Adekunbiola, B. (2022). Effect of Health Education on the Knowledge of Cervical Cancer, Human Papillomavirus and Self-sampling Among Women in a Low-Resource Setting. European Journal of Medical and Health Sciences, 4(3), 145-151. doi: 10.24018/ejmed.2022.4.3.1316 available at https://doi.org/10.24018/ejmed.2022.4.3.1316
8. Bruni, L., Albero, G., Serrano, B., Mena, M., Collado, J. J., Gómez, D., ... & de Sanjosé, S. (2023). ICO/IARC Information Centre on HPV and Cancer (HPV Information Centre). Human Papillomavirus and related diseases in the world.. XWX. pdf.
9. Centers for Disease Control and Prevention. Cervical Cancer Statistics. (2022). Available online: https://www.cdc.gov/cancer/cervical/statistics/index.htm
10. Dedey, F., Nsaful, J., Nartey, E., Labi, J., Adu-Aryee, N. A., Kuti, C., & Clegg-Lamptey, J. N. (2024). Assessing the impact of cervical cancer education in two high schools in Ghana. BMC cancer, 24(1), 1-8.
11. Di Giuseppe, G., Angelillo, S., Bianco, A., Gallè, F., Licata, F., Liguori, G., & Angelillo, F. (2023). Evaluating knowledge, attitudes, and behaviors toward HPV infection and vaccination among university students in Italy. Vaccines, 11(10), 1517.
12. Drokow, K., Effah, Y., Agboyibor, C., Sasu, E., Amponsem-Boateng, C., Akpabla, S., Ahmed, W. & Sun, K. (2021). The Impact of Video- Based Educational Interventions on Cervical Cancer, Pap Smear and HPV Vaccines. Front Public Health, 9, 681319. Available at https://doi.org/10.3389/fpubh.2021.681319

13. Ebrahim Mahmoud, A., Abdelhakeem Aboud, S., & Kamal Ali, F. (2021). Effect of the educational package based on health belief model on nursing students' knowledge and attitude regarding human papillomavirus and cervical cancer. Journal of Nursing Science Benha University, 2(2), 809-828.
14. El-Sayed, T. E. S., Elsayed, R. M., Mohamed, A. G., & Aboushady, R. M. N. (2020). Effect of Tele-nursing Instructions on Women Knowledge and Beliefs about Cervical Cancer Prevention. Assiut Scientific Nursing Journal, 8(23), 153-165.
15. Global Cancer Observatory [Internet]. [cited 2023. Accessed February 10, 2023 at: https://gco.iarc.fr/
16. Hassan Abuel-Zahab, N., El-Sheikh, M., Abdel-Fattah, H., & Samir Metwally, N. (2022). Effect of Nursing Guideline about Genital Human Papilloma Virus Infection on perception of Female University Students. Egyptian Journal of Health Care, 13(1), 130-145.Available at https://doi.org/10.21608/ejhc.2022.214085 .
17. Indracanti, M., Berhane, N., & Minyamer, T. (2021). Factors associated with pre-and post-educational intervention knowledge levels of hpv and cervical cancer among the male and female university students, northwest ethiopia. Cancer Management and Research, 7149-7163.Available at https://doi.org/10.2147/CMAR.S326544.
18. Kindi A., Sumri, A., Muhdhoori, A., Mamari, A., Kalbani, A. & Al-Azri, H. (2024). Knowledge of cervical cancer screening among Omani women attending a university teaching hospital: a cross-sectional study. BMC Womens Health, 24(1), 40. Available at https://doi.org/10.1186/s12905-023-02870-7
19. Liu, Y., Di, N., & Tao, X. (2020). Knowledge, practice and attitude towards HPV vaccination among college students in Beijing, China. Human Vaccines & Immunotherapeutics, 16(1), 116-123.
20. Mbulawa,.A., Somdyala,.I., Mabunda, A. et al (2021). Effect of Human Papillomavirus (HPV) Education Intervention on HPV Knowledge and Awareness Among High School Learners in Eastern Cape Province of South Africa. J Canc Educ 38, 146–152 (2023). https://doi.org/10.1007/s13187-021-02090-3
21. Mohammed Elmwafie, S., & Sayed Abdelaziz, F. (2022). The Effect of Health Belief Model for Preventing and Controlling Cancer Risk Behaviors among School Age Children. Egyptian Journal of Health Care, 13(4), 1488-1509.
22. Mullapally, K., Basu, P., & Parikh, P. (2023). Prevention of Cervical Cancer through HPV Vaccination and Screening in Maldives. South Asian Journal of Cancer, 12(01), 044-046. Available at: https://hpvcentre.net/statistics/reports/MDV.pdf
23. Musella, G., Liguori, S., Cantile, T., Adamo, D., Coppola, N., Canfora, F., ... & Leuci, S. (2024). Knowledge, attitude and perception of Italian dental students toward HPV-related oropharyngeal cancer and vaccination: a cross-sectional study. BMC Oral Health, 24(1), 1213.
24. Poudel, K., Sumi, N., & Yano, R. (2021,). Impact of peer-led cancer education program on knowledge, health beliefs, practice, and self-esteem among pairs of Nepalese high-school students and their knowledge-sharing partners. In Healthcare (Vol. 9, No. 1, p. 64). MDPI available at https://doi.org/10.3390/healthcare9010064.
25. Ran, H., Chen, Y., Gao, J., Guo, H., & Peng, S. (2022). Low awareness of HPV infection and willingness of HPV vaccination among Chinese male college students in the east of China. Frontiers in Public Health, 10, 971707.
26. Si, M., Jiang, Y., Su, X., Wang, W., Zhang, X., Gu, X., & Qiao, Y. (2021). Willingness to accept human papillomavirus vaccination and its influencing factors using information–motivation–behavior skills model: a cross-sectional study of female college freshmen in mainland China. Cancer Control, 28, 10732748211032899.
27. Somera LP, Diaz T, Mummert A, Badowski G, Choi J, Palaganas H, Ayson K (2023). Cervical Cancer and HPV Knowledge and Awareness: An Educational Intervention among College Students in Guam. Asian Pac J Cancer Prev. 2023 Feb 1;24(2):443-449. Available at http:// doi: 10.31557/APJCP.2023.24.2.443. PMID: 36853291; PMCID: PMC10162609.
28. Van Dang, N., & Phuong, N. (2024). Knowledge and attitude about HPV vaccine among the 4th year female nursing students at Hanoi Medical University. Tạp chí Nghiên cứu Y học, 184(11E15), 106-116.Available at https://doi.org/10.52852/tcncyh.v184i11E15.2716
29. Wang, Y., Chen, Y., & Bao, S. (2023). The impact of exposure to HPV related information and injunctive norms on young women's intentions to receive the HPV vaccine in China: A structural equation model based on KAP theory. Frontiers in public health, 10, 1102590.
30. World Health Organization. (2022). Human papillomavirus vaccines: WHO position paper (2022 update)– Weekly Epidemiological Record, 97(50), 645-672. Available online: https://www.who.int/teams/immunization-vaccines-and biologicals/diseases/human-papillomavirus-vaccines-(HPV)

31. Yin, G., Zhang, Y., Chen, C., Ren, H., Guo, B., & Zhang, M. (2021). Have you ever heard of Human Papillomavirus (HPV) vaccine? The awareness of HPV vaccine for college students in China based on meta-analysis. Human Vaccines & Immunotherapeutics, 17(8), 2736–2747.available at https://doi.org/10.1080/21645515.2021.1899731.
32. You, D., Han, L., Li, L., Hu, J., D. Zimet, G., Alias, H., ... & Wong, L. P. (2020). Human papillomavirus (HPV) vaccine uptake and the willingness to receive the HPV vaccination among female college students in China: a multicenter study. Vaccines, 8(1), 31.
33. Zhang, F., Li, M., Li, X. et al (2022). Knowledge of cervical cancer prevention and treatment, and willingness to receive HPV vaccination among college students in China. BMC Public Health 22, 2269 (2022).Available at https://doi.org/10.1186/s12889-022-14718-0 .
34. Zomordi, G., Moradi, M., Hasanzadeh, M., & Ghavami, V. (2022). The effect of education based on the theory of planned behavior on the intention of vaccination against human papillomavirus in female students: A controlled educational trial. Journal of Education and Health Promotion, 11(1), 237.

الملخص العربي

المقدمة: يُعد سرطان عنق الرحم أكثر الأورام الخبيثة شيوعًا بين النساء حول العالم. لذا يلزم القيام ببرنامج توعية لتشجيع الطالبات وتثقيفهن في سن مبكرة حول عوامل خطر الإصابة بسرطان عنق الرحم وفوائد لقاح فيروس الورم الحليمي البشري، بالإضافة إلى التخلص الخرافات والمفاهيم الخاطئة وزيادة استعدادهن لتلقي اللقاح. **الهدف:** تهدف الدراسة إلي تقييم تأثير جلسات التوعية على معارف طالبات التمريض ومعتقداتهن ورغبتهن في الوقاية من سرطان عنق الرحم من خلال التطعيم. **تصميم البحث:** تم استُخدام تصميم شبه تجريبي قبلي وبعدي لتحقيق هدف الدراسة. **مكان الدراسة:** أُجريت الدراسة في كلية التمريض بالجامعة الحديثة للتكنولوجيا والمعلومات. **عينة الدراسة:** عينة غرضية من 205 طالبة. **أدوات الدراسة:** (أ) استبيان البيانات ديموغرافية (ب) استبيان معرفة الطالبات عن الوقاية من سرطان عنق الرحم عن طريق التطعيم (ج) مقياس معتقدات الطلاب عن الوقاية من سرطان عنق الرحم عن طريق التطعيم. (د) مقياس استعداد الطالبات لتلقي تطعيم الفيروس الحليمي البشري للوقاية من سرطان عنق الرحم.**النتائج:** أظهرت النتائج أن المستوى الإجمالي لدرجات المعرفة الجيدة لطلاب التمريض فيما يتعلق بالوقاية من سرطان عنق الرحم قد ارتفع من (11.70)في الاختبار القبلي إلي (84.90٪) في الاختبار البعدي، كما تحسنت درجة المعتقدات الإيجابية الإجمالية لطلاب التمريض فيما يتعلق بفيروس الورم الحليمي البشري من (33.70٪) في الاختبار القبلي إلى (91.20٪) في الاختبار البعدي كما ارتفع استعداد الطالبات للتطعيم ضد فيروس الورم الحليمي البشري من(8.80٪) في الاختبار القبلي إلى 76.60٪ في الاختبار البعدي، مع وجود فرق كبير ذو دلالة إحصائية. بالإضافة إلى ذلك، توجد علاقة إيجابية كبيرة بين إجمالي المعرفة البعدية للطالبات ومعتقداتهم واستعدادهم للتطعيم ضد فيروس الورم الحليمي البشري. **الخلاصة:** يوجد تحسن كبير في معرفة الطالبات ومعتقداتهم الإيجابية حول تطعيم فيروس الورم الحليمي البشري واستعدادهم لتلقي اللقاح بعد جلسات التوعية. **التوصية:** أوصت الدراسة بالقيام بحملات توعية وبرامج تطعيم للطالبات في سن مبكرة لتعزيز الوصول إلى خدمات الوقاية من سرطان عنق الرحم عن طريق التطعيم ضد فيروس الورم الحليمي البشري.

الكلمات الدالة الوقاية من سرطان عنق الرحم، الطالبات، التطعيم، جلسات التوعية، المعرفة، المعتقدات والاستعداد