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ORIGINAL ARTICLE

A review of knowledge and attitudes of young people on cervical cancer and HPV vaccination

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Abstract

Aim Cervical cancer is a significant global health concern worldwide, and the second most common cause of cancer mortality, especially in developing countries. Since young people are more affected by cervical cancer, we aimed to investigate young people's knowledge of and attitudes towards cervical cancer and human papillomavirus vaccination by comparing developing and developed countries' results, by reviewing the published literature.

Subjects and methods Due to the medical nature of the question, the search was confined to Pubmed, Scopus, Web of Science, and Google Scholar. Over 100 abstracts published up to March 2018 which included young people's knowledge and attitudes were found. After a careful screening process of all authors, 50 of these articles were considered as appropriate, and reviewed.

Results Human papillomavirus infection, cervical cancer, and human papillomavirus vaccines knowledge are generally low among young people. The knowledge level is higher in developed countries but is still insufficient.

Conclusion Cervical cancer is potentially preventable. Effective screening and education programs with regard to human papillomavirus vaccination and infection can lead to a significant reduction in morbidity and mortality.

Keywords HPV · Cervical cancer · Infection · Young people · Review

Introduction

Cervical cancer is a significant global health concern worldwide, and the second most common cause of cancer mortality, especially in developing countries. A major risk factor is long-term infection with types 16 and 18 of human papillomavirus (HPV) (Koç 2015). It is transmitted by sexual activity, and generally affects women under the age of 30 years. Adolescents who have various sexual behaviors and immature genital systems are at more risk. HPV is also a risk factor for vulva, anus, vagina, penis, head, and neck cancers (Anagnostou et al. 2017).

Cervical cancer is potentially preventable. Routine screening programs using the Papanicolaou test (Pap test) can lead to early detection and significant reduction in mortality. Prophylactic HPV vaccines have been developed to avoid approximately 70% of the cervical cancer risk (Boone et al. 2016). The US Food and Drug Administration licensed a quadrivalent vaccine against HPV6/11/16/18 in 2006 and a bivalent vaccine against HPV16/18 in 2009 (Sukegawa et al. 2015).

Alternatively to the Papanicolaou test, some other strategies have been developed and used, especially in developing countries. Visual inspection with acetic acid and visual inspection with Lugol's iodine tests have been used in trials (AbdAllah et al. 2016). Screening programs, vaccination rates, and cervical cancer mortality vary between the countries. Since young people are more affected by cervical cancer, we aimed to investigate young people's knowledge and attitudes on cervical cancer and HPV vaccination by comparing the results of developing and developed countries.

Methods

This work reviews the published literature concerning young people's knowledge of and attitudes towards cervical cancer and HPV vaccination.

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Inclusion and exclusion criteria

This systematic review includes all the most recent questionnaire studies on this subject. The results were restricted to articles written in English. We excluded works investigating the knowledge and attitudes of older people.

Information sources

Due to the medical nature of the question, the search was confined to Pubmed, Scopus, Web of Science, and Google Scholar. Over 100 abstracts published till March 2018 including the young people's knowledge and attitudes were found. After a careful screening process of all authors, 50 of these articles were considered as appropriate, and reviewed. The search terms included a combination of woman, cervical cancer, young people, students, knowledge, attitude, HPV, vaccination, and cancer.

Results

Developing countries

Asia and Europe

Turkey Low-level awareness and knowledge of cervical cancer risk factors, HPV, and HPV vaccination among 800 students was reported by Koç (2015). Knowledge and opinions of university students about HPV vaccine were studied by Unutkan and Yangın (2016): in total, 468 students whose mean age was 21.07 ± 1.98 were included. This study showed that the majority of the students had no knowledge about HPV (Unutkan and Yangın 2016). Yörük et al.'s study included 725 volunteers: mean age was 20.5 ± 1.6. The authors reported that this research group's knowledge with regard to risk factors of cervical cancer, Pap smear test, symptoms and prevention methods for cancer, HPV, and HPV vaccine was low (Yörük et al. 2016). Knowledge, attitudes, and beliefs about cervical cancer and human papilloma virus (HPV) vaccination of Turkish university students were investigated in terms of awareness of HPV and acceptability of HPV vaccine by Topçu et al. (2017): a total of 287 students were included. This study showed that awareness of the protective effect of HPV vaccination against cancer was the most powerful factor for HPV vaccine administration among Turkish university students (Topçu et al. 2017).

Pakistan Khan et al. (2014) studied understanding and responsiveness level witrh regard to cervical cancer and its avoidance among young women of Pakistan: a total of 873 women took part in this survey. This study demonstrated a low level of awareness among Pakistani women (Khan et al. 2014). Knowledge, attitudes, and perception towards human papillomavirus was analyzed by Khan et al. (2016) among Pakistani young people: 390 university students whose mean age was 25 ± 8.1 years were included in this study. The results of this study revealed a poor understanding among respondents of the health problems associated with HPV, its prevention, modes of transmission, and availability of HPV vaccine (Khan et al. 2016).

Malaysia Knowledge, willingness to pay for cervical cancer vaccination, the relationships between knowledge and attitudes towards HPV vaccination of Malaysian medical students, and variation between different cultural groups, were reported by Maharajan et al. (2015). A total of 302 participants were recruited and interviewed with standard questionnaires. The authors stated that knowledge sith regard to HPV, vaccination, cervical cancer screening, and cervical cancer risk factors was good; in addition, no differences based on ethnicity were reported (Maharajan et al. 2015). Another study on awareness and acceptance of human papillomavirus vaccination among Malaysian young people was conducted by Rajiah et al. (2015); 320 health sciences students who were available during the study period were approached to participate in this study. The mean age of the participants was 22.2. The students demonstrated moderate knowledge about HPV infection and vaccination (Rajiah et al. 2015). Apart from the students, research was conducted among young people living in rural area of Malaysia; 449 women were eligible to participate if aged between 18 and 25 years, and living in the household. Authors reported that knowledge of HPV, HPV vaccination, cervical screening, and cervical cancer risk factors was extremely poor among these participants (Wong 2011).

India Ganju et al. (2017) reviewed knowledge and attitude of Indian medical and nursing students towards screening for cervical carcinoma and HPV vaccination. A total of 400 participants with a mean age of 22.54 years were included in this work. Authors reported that awareness of cervical cancer and prevention by screening showed several gaps in knowledge and misconceptions (Ganju et al. 2017). Knowledge and attitude of female graduate students on cervical cancer was assessed by Koshy et al. (2017). The sample consists of 400 women in the age group 18–25 years. This study highlights lack of awareness of various aspects of cervical cancer among young women (Koshy et al. 2017). Zaheer et al. (2017) studied awareness with regard to human papillomavirus and its prevention among undergraduate female students. The study consisted of 1038 participants aged between 17 and 26 years. Results indicated that only a few respondents were aware of sexually transmitted diseases, cervical cancer, and human papillomavirus (Zaheer et al. 2017). Rathod et al. (2017) studied cervical cancer and HPV vaccine knowledge among 300 medical students in the age group 18–25 years. The study showed inadequate knowledge with regard to cervical cancer, vaccination, and screening (Rathod et al. 2017).

Lebanon Knowledge, attitudes, and intentions of college female students with regard to HPV vaccination in Lebanon was researched by Dany et al. (2015). The median knowledge score of 52.7% ± 1.71 reflects poor to moderate knowledge about HPV. The authors highlighted the importance of offering guidance to female college students about HPV and HPV vaccination in developing countries where the incidence of sexually transmitted infections is on the rise (Dany et al. 2015).

Africa

Sudan Sudanese nursing student awareness and attitude was examined by AbdAllah et al. (2016). A total of 246 students between 18 and 30 years old were randomly selected to participate in the study. The results of the study showed that most of the students had poor information about cervical cancer prevention (AbdAllah et al. 2016).

Ethiopia Knowledge, attitude, and acceptability with regard to HPV and HPV vaccination among Ethiopian female students were researched by Geneti et al. (2016); 397 female undergraduate medical students with a mean age of 22.1 years were included in the study. This study showed low knowledge level and a high unfavorable attitude towards HPV infection and its vaccination among female students (Geneti et al. 2016). Mulatu et al. (2017) studied knowledge, attitude, and practice with regard to cervical cancer screening among female students with a mean age of 21 (SD ± 1.60) years; 217 female students were recruited. The study showed that there is a lack of knowledge on cervical cancer and its screening. There is also poor utilization of screening services (Mulatu et al. 2017). Awareness and knowledge of HPV and cervical cancer among Ethiopian female students were investigated by Tesfaye et al. (2018); a total of 267 female students with ages ranging from 18 to 24 years participated in the study. Authors reported that awareness and knowledge level among students were low (Tesfaye et al. 2018).

Nigeria Adejuyigbe et al. (2015) studied HPV and cervical cancer knowledge and acceptance of vaccination among Nigerian students; 280 students were included. Results of the study noted that there were gaps in knowledge with regard to cervical cancer, HPV and HPV vaccination; in addition, full acceptability of HPV vaccination was low (Adejuyigbe et al. 2015). Cervical cancer knowledge, perception, and prevention attitude among female students of reproductive age was assessed by Ibrahim (2014); 300 respondents were included in this study. It was discovered that most of the respondents were not aware of the increased rate of cervical cancer, but most of the respondents agreed that screening and vaccination can prevent cancer of the cervix (Ibrahim 2014). Ibekwe (2015) studied knowledge, attitude, and practice with reagrd to cervical cancer and its screening among 100 female students whose mean age was 24.2 ± 2.6 years. The author reported that the level of knowledge on cervical cancer and its screening was high, the attitude was good, but the uptake of the screening service was very poor (Ibekwe 2015). Poor information among young people with regard to perception and knowledge about HPV vaccine, HPV infection, and cervical cancer was also noted in Nigerian people; this research was conducted with 296 participants aged between 12 and 19 years (Ndikom and Oboh 2017).

South Africa Hoque et al. (2013) assessed awareness of cervical cancer, risk factors, and acceptability of HPV vaccination among female undergraduates in South Africa; 440 students was selected by stratified random sampling techniques. The authors reported that awareness concerning cervical cancer was poor: however, the students had positive attitudes toward getting vaccinated with the HPV vaccine (Hoque et al. 2013). Hoque et al. (2014) studied information with regard to knowledge, beliefs, and screening history of South African women about cervical cancer; involving a total of 440 students whose mean age was 20.39 years. This study showed that educated women in South Africa have poor information on cervical cancer (Hoque et al. 2014). In a recent study carried out by Ogbonna (2017) concerning knowledge, attitude, and experience of cervical cancer and screening among 186 African students, the author reported that female African students had poor knowledge of cervical cancer and screening (Ogbonna 2017). The awareness and detection methods of cervical cancer among 180 students was assessed by Hoque (2013). Results indicate poor knowledge of cervical cancer, its risk factors, detection methods, and utilization (Hoque 2013).

Ghana Abotchie and Shokar (2009) studied cervical cancer screening among college students in Ghana; 140 females were recruited, with an age range of 20–35 years. The authors reported that women had a low level of knowledge and were unaware of screening tests, and that only 7.9% were aware of the link between HPV and cervical cancer (Abotchie and Shokar 2009).

North America

Mexico A questionnaire survey was carried out to evaluate knowledge with regard to the prevention of cervical cancer among 126 Mexican medical and nursing students. The authors concluded that the students knew theoretical concepts about cervical cancer; however, they did not receive information on specific elements of the practice (Gonzales-Loza et al. 2006).

South America

Dominician Republic In a Dominician study conducted with 100 female medical students who were older than 15 years of age, it was reported that the level of awareness with regard to cervical cancer and screening is high, but that knowledge of methods of prevention including cervical screening is very poor (Akpo et al. 2016).

Colombia Rodríguez-Feria et al. (2016) reported on knowledge, attitudes, and practices of prevention for cervical cancer among Colombian young people; 64 students were included in the work. The authors reported that knowledge, attitudes, and practices wereat a low level and must be improved among students (Rodríguez-Feria et al. 2016).

Costa Rica Knowledge of cervical cancer, prevention methods, and infection resources of high school students in Costa Rica was assessed by Carlson and Gonzalez (2014); a total of 533 students participated. The authors reported that only 30.8% of students were aware of cervical cancer and that their knowledge was low (Carlson and Gonzalez 2014).

Developed Countries

North America

USA LaJoie et al. (2018) assessed the knowledge, attitudes, and beliefs of 585 male and female college students in Kentucky with regard to HPV-associated diseases and vaccines, and aimed to determine which parameters predicted self-reported uptake of HPV vaccination. The study found that HPV vaccination has been successful in young adult college students in Kentucky. Young adults prefer their partners to be HPV vaccinated regardless of whether they themselves are vaccinated (LaJoie et al. 2018). Boone et al. (2016) compared vaccinated ($n = 1123$) with unvaccinated ($n = 1123$) women aged 14–26 years. Women who were vaccinated were more likely to screen than unvaccinated women; screening rate was highest after and occurred closest to the first vaccine dose. Research evaluating the efficacy of a one-dose vaccine is warranted, and may provide both higher vaccination and screening rates (Boone et al. 2016). Alexander et al. (2014) evaluated 568 women 18–26 years old presenting for health care in an urban college student health and wellness clinic in the US Midwest. The purpose of this study was to determine the influence of satisfaction with the decision to accept or reject the HPV vaccine, as well as traditional clinical factors, on the intent to participate in future screening. The authors reported that HPV vaccination implementation programs must help women to be the owner of their decision. Intent to participate in future cervical cancer screenings is lower when satisfaction with the decision to be vaccinated is neutral. (Alexander et al. 2014). Harper et al. (2014a) conducted a prospective survey of women 18–26 years of age at an urban university student health clinic concerning HPV vaccination, using a 5-point Likert scale; 601 women with a mean age of 21.5 years (SD 2.4) participated in 2011 and 2012. Regardless of the woman's vaccination status, women had a significantly higher (strongly agree/agree) preference for the male partner being vaccinated with HPV4 than not caring if he was vaccinated (63.6% vs 13.1%, $p < 0.001$). Harper et al. (2014b), aimed to determine the satisfaction associated with a decision to accept or reject HPV vaccination. This was a prospective survey conducted at an urban college where women 18–26 years old completed a decisional satisfaction survey with regard to their HPV vaccine experience. Regardless of the decision to accept or reject HPV vaccination, the decisional satisfaction was very high [mean 5-item score = 21.2 (SD 3.8)]. Women without HPV vaccination were decisionally neutral significantly more often than those already vaccinated; 22% were decisionally neutral for the option to accept HPV vaccination at that visit (Harper et al. 2014b).

Europe

Greece A survey evaluating the awareness of 323 female students with regard to cervical cancer, prevention method, Pap test, and HPV vaccination was conducted by Dehara et al. (2014). The authors reported sufficient knowledge about cervical cancer and prevention methods but insufficient knowledge with regard to Pap test and HPV vaccination among the students (Dehara et al. 2014). Another large study with 4547 people conducted by Vaidakis et al. (2017) supported previous findings about the Greek adolescent population. Authors reported lack of knowledge concerning human papilloma virus (HPV) and vaccination (Vaidakis et al. 2017). HPV knowledge and vaccine acceptability among adolescents in Greece was investigated by Anagnostou et al. (2017); a total of 268 students with 15–18 years old were included. Analysis of individual items documented low knowledge among both female and male students (Anagnostou et al. 2017).

Poland Research conducted in Poland among 400 female students aged between 17 and 26 years showed that general awareness of cervical cancer among young women was insufficient. Furthermore, a high percentage of women had never heard of the HPV vaccine (Kamzol et al. 2013).

United Kingdom Sherman et al. (2016) conducted a survey to explore levels of awareness and knowledge of HPV and cervical cancer in 170 British female students. The authors reported that knowledge and awareness of HPV and cervical cancer had increased. However, there is still a considerable number of women with little to no knowledge of HPV (Sherman et al. 2016).

Lithuania Young people's knowledge concerning cervical cancer risk factors in Lithuania was surveyed by Kurtinaitienė et al. (2007); 687 students of higher education institutions were included. The findings showed that the majority of students had heard about HPV before; however, authors concluded that HPV-focused educational interventions are needed for the primary prevention of all sexually transmitted diseases (Kurtinaitienė et al. 2007).

Latvia Patel et al. (2017) conducted a cross-sectional study with 270 Latvian adolescents to detect knowledge of sexually transmitted infections, HPV, and HPV vaccine. The authors reported that while there is a high prevalence of HPV infection in Latvia, poor knowledge was seen among adolescents (Patel et al. 2017).

Hungary Balla et al. (2015) investigated the knowledge and attitudes of high school girls in Budapest about cervical cancer and HPV vaccination; 492 students participated in this study. Authors concluded that students' knowledge about cervical cancer and HPV vaccination was low (Balla et al. 2015).

Asia

Hong Kong Attitude, acceptability, and knowledge of HPV vaccination in Hong Kong was surveyed by the Chiang et al. (2016); 437 samples were collected. The authors concluded that knowledge and awareness among local undergraduate students in Hong Kong concerning HPV infection is not high, and their HPV vaccination rate is relatively low (Chiang et al. 2016).

Taiwan HPV vaccine knowledge and cervical cancer risk and its prevention with HPV vaccine among female college students in Taiwan was assessed by Wang and Wu (2013); a total of 150 students were included. Finding of this research showed that most students had heard HPV vaccine and they were generally receptive to information regarding HPV vaccine knowledge (Wang and Wu 2013).

United Arab Emirates Artan et al. (2015) assessed knowledge with regard to HPV, cervical cancer, and HPV vaccination among female students in UAE. The study included 226 participants. A low level of knowledge was found, but the majority of students had a positive attitude towards the vaccine and its usage (Artan et al. 2015).

Saudi Arabia Al-Shaikh et al. (2014) studied knowledge of Saudi Arabian female students with regard to cervical cancer and accepting vaccination; 1400 students aged between 18 and 25 years were included in this work. The authors reported that there was a lack of information regarding cervical cancer, Pap test, and vaccination among students (Al-Shaikh et al. 2014).

Japan A study was conducted in Japan among newly enrolled female university students. Participants were asked about their HPV vaccination status. They were also questioned about factors that potentially influenced HPV vaccination (Sukegawa et al. 2015). The authors reported that HPV vaccination rate increased between the years 2011–2013. Good knowledge with regard to cervical cancer among students was also noted by the authors (Sukegawa et al. 2015).

Australia HPV infection, cervical cancer, and HPV vaccine knowledge among Australian people was analyzed by Giles et al. (2006). Ninety women aged 18–30 years were included. The authors concluded that many women do not understand the risk factors for HPV infection, and the potential long-term complications. Few women had heard of the HPV vaccine (Giles et al. 2006).

Conclusion

In conclusion, knowledge concerning HPV infection, cervical cancer, and HPV vaccine is generally low among young people. Of course, the knowledge level is higher in developed countries, but is still insufficient. Cervical cancer is potentially preventable. Effective screening and education programs about HPV infection and vaccination can lead to a significant reduction in morbidity and mortality.

Compliance with ethical standards

Conflict of interest The authors have no conflict of interest.

Author statement This work does not require ethical approval, as it does not involve human participants or personal data. This is a review of the published literature.

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