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SYSTEMATIC REVIEW

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What do Young People Think About HPV and HPV Vaccination? The Role of Health Education Interventions and Health Professionals

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ABSTRACT

Background: Human papillomavirus (HPV) is the most common sexually transmitted infection worldwide and its highest prevalence is observed in adolescents and young adults. This review examined studies that explore awareness about HPV among adolescents and young adults, as well as their attitudes and willingness towards the HPV vaccine. Besides, the impact of health professionals and health education interventions on HPV awareness and attitudes towards HPV vaccine is identified. **Objective:** The aim of this review is, firstly, to systematically identify the studies that explore awareness about HPV among adolescents and young adults, as well as their attitudes and willingness towards the HPV vaccine. Secondly, the aim is to identify the impact of health professionals and health education interventions on HPV awareness and attitudes towards HPV vaccine among the same group. **Methods:** The systematic review was conducted in the international databases PubMed, Scopus, and Google Scholar, between 2016-2019. **Results:** The review revealed low to moderate levels of awareness and knowledge regarding HPV (10 studies), while a more favorable attitude towards the HPV vaccine (3 studies). The role of health professionals was ineffective (4 studies), while studies focused on the impact of health education interventions showed a positive impact on knowledge and awareness of HPV (4 studies). **Conclusion:** Continuous training of health personnel is necessary and new studies are needed to identify barriers to adolescents not being vaccinated.

Keywords: HPV knowledge, HPV attitudes, adolescents, vaccination, health professionals, health education intervention programs.

1. BACKGROUND

Human papillomavirus (HPV) is the most common sexually transmitted infection (STI) worldwide (1). HPV infections and HPV related diseases have increased in recent decades due to the increase in sexual risk (2). The highest prevalence of HPV is observed in adolescents and young adults (3). Therefore, it is necessary to implement effective health education interventions among adolescents. However, adolescents do not receive health education on HPV regularly. Health professionals play a key role in providing this information (4). Adolescents have low awareness and knowledge about the virus, especially when it comes to cancer risks (5). Health education interventions can increase adolescents' awareness and knowledge about HPV prevention (6), enhance preventive behaviors for sexually transmitted infections in general (7) and reduce sexual arousal risks (8). Besides, interventions can also have a beneficial effect on beliefs about HPV vaccination among girls (9).

The implementation of vaccinations is one of the most popular interventions in public health to fight infectious diseases (10). HPV vaccination is routinely recommended at age 11 or 12 years; vaccination can be given starting at age 9 years (11). Just 16% of US adolescents completed HPV vaccination before turning 13, and 35% completed HPV vaccination before turning 15 (12). The role of healthcare professionals regarding the HPV vaccine and shaping the attitudes of parents, adolescents, and young people towards

	Authors, Year of publication	Title of article	Country	Sample	Sampling method
1	Liu CR, Hao L, Xi Z, Chen P, Qin L, Qiao-Ling L, Fei-Yang R, Jing L, (2019)17	Effect of an educational intervention on HPV knowledge and attitudes towards HPV and its vaccines among junior middle school students in Chengdu, China	China	1675 students aged 10-14 years	convenience sampling
2	Kasymova S, Harrison SE, Pascal C, (2019)18	Knowledge and Awareness of Human Papillomavirus Among College Students in South Carolina	USA	256 college students	purposive sampling
3	Wong LP, Alias H, Sam IC, Zimet GD, (2019)19	A Nationwide Study Comparing Knowledge and Beliefs about HPV among Female Students before and after HPV Vaccination	Malaysia	2664 female students aged 13 years	random sampling
4	Boyd ED, Phillips JM, Schoenberger YM, Simpson T, (2018)20	Barriers and facilitators to HPV vaccination among rural Alabama adolescents and their caregivers	USA	34 adolescents aged 11 – 18 years	purposive sampling
5	Restivo V, Costantino C, Fazio TF, Casuccio N, D'Angelo C, Vitale F, Casuccio A, (2018)21	Factors Associated with HPV Vaccine Refusal among Young Adult Women after Ten Years of Vaccine Implementation	Italy	638 young adult women aged 18–21 years	convenience sampling
6	Staples JN, Wong MS, Rimel BJ, (2018)22	An educational intervention to improve human papilloma virus (HPV) and cervical cancer knowledge among African American college students	USA	72 students	purposive sampling
7	Scherer AM, Schacht Reisinger H, Schweizer ML, Askelson NM, Fagerlin A, Lynch CF, (2018)23	Cross-sectional associations between psychological traits, and HPV vaccine uptake and intentions in young adults from the United States	USA	1674 people aged 18-26 years old	random sampling
8	Karamanidou C, Dimopoulos K, (2018)24	Knowledge, beliefs and communication preferences with regards to the HPV vaccine; the perspective of unvaccinated Greek adolescent girls, young women, and mothers of vaccine-eligible girls	Greece	6 focus groups, 40 women (5-8 participants)	convenience sampling
9	A. Efkarpidis, G. Koulterakis, P. Efkarpidis, M. Sakellariou, A. Taxidis, (2018)25	Human papillomavirus related knowledge and beliefs among high school pupils in an island region in Greece	Greece	566 students	convenience sampling
10	Anagnostou PA, Aletras VH, Niakas DA, (2017)26	Human papillomavirus knowledge and vaccine acceptability among adolescents in a Greek region	Greece	268 students	convenience sampling
11	Grandahl M, Larsson M, Tydén T, Stenhammar C, (2017) 27	School nurses' attitudes towards and experiences of the Swedish school-based HPV vaccination programme–A repeated cross sectional study	Sweden	736 school nurses	convenience sampling
12	Krakov M, Beavis A, Cosides O, Rositch AF, (2017)28	Characteristics of Adolescents Lacking Provider-Recommended Human Papillomavirus Vaccination	USA	12,742 teenagers aged 13–17 years	random sampling
13	Vaidakis D, Moustaki I, Zervas I, Barbouni A, Merakou K, Chrysi MS, Creatsa G, Panoskaltsis T, (2017)29	Knowledge of Greek adolescents on human papilloma virus (HPV) and vaccination: A national epidemiologic study	Greece	4547 adolescents aged 17 -18 years	purposive sampling

Table 1.

this vaccine has been highlighted in the international literature (13-14).

Acceptance of vaccines is essential to the successful implementation of HPV vaccination programs. Adolescents, who are the main target group and their parents who are responsible for decision making, should have a positive view about the vaccine to ensure full coverage (15).

2. OBJECTIVE

The aim of this review is, firstly, to systematically identify the studies that explore awareness about HPV among adolescents and young adults, as well as their attitudes and willingness towards the HPV vaccine. Secondly, the aim is to identify the impact of health professionals and health

education interventions on HPV awareness and attitudes towards HPV vaccine among the same group.

3. METHODS

The search was conducted in the international databases PubMed, Scopus, and Google Scholar using the combinations of the following mesh terms: “HPV knowledge”, “HPV attitudes”, “adolescents”, “vaccination”, “health professionals”, “health education intervention programs”. The search was conducted between November and December 2019.

Inclusion criteria were: a) the year of publication (2016-2019), b) study topic relevance and c) the English language. Moreover, only surveys randomized controlled trials, quasi-experimental trials, and epidemiologic studies were

	Type of re-search–Design	Research tool	Statistical analysis	Sample size per group	Response Rate	Follow up rate
1	School-based interventional follow-up study	Questionnaires	EpiData 3.1 SPSS statistical software version 18 (p-value <0.05)	751 students – control group 924 students – intervention group	100%	100%
2	Cross-sectional survey	Questionnaires 1. Demographic data 2. HPV awareness, perceptions, and experiences 3. 18-item HPV knowledge scale	STATA Chi-square tests	-----	100%	100%
3	Nationwide longitudinal survey	Questionnaires 1. Demographic data 2. Mean knowledge score of HPV infection	SPSS statistical software (p-value <0.05)	-----	70% (2,005 female students)	70% (2,005 female students)
4	Qualitative study	Interview and discussion groups	-----	-----	100%	100%
5	Cross-sectional study/ observational study	Questionnaires 1. Demographic data 2. HPV vaccination knowledge and health belief	STATA v14.2 software (p-value ≤ 0.05) ANOVA (Scheffe post-hoc and Mann-Whitney test) (p < 0.1)	-----	22% (141 young adult women)	22% (141 young adult women)
6	Observational study	5 lectures, 60 min. each regarding HPV Questionnaires pre- and post-, assessing knowledge, attitudes and beliefs related to cervical cancer screening, HPV, and the HPV vaccine	SPSS statistical software (p-value <0.05)	-----	79% (57 students)	79% (57 students)
7	Exploratory examination	Questionnaires 1. Demographic data 2. HPV vaccination status and vaccination intentions 3. Understanding health-related information (Health Literacy measure, Subjective Numeracy Scale) 4. Deliberation (Cognitive Reflection Task 2.0) 5. Managing uncertainty (Brief Need for Cognitive Closure Scale, Actively Open-Minded Thinking Scale) 6. Managing threat (Social Dominance Orientation Scale)	ANOVA (p-value <0.05)	50% aged 18 – 21 years 50% aged 22 – 26 years	84% (1406 adults)	84% (1406 adults)
8	Cross-sectional study, qualitative methodology	Questionnaires 1. Demographic data 2. Knowledge item scale Intervention: Leaflet, an expert interview, Documentary	-----	1) non-vaccinated teenagers aged 12–17 years (16) 2) non-vaccinated young women aged 18–26 years (11) 3) mothers of non-vaccinated daughters aged 12–17 years (13)	100%	100%
9	Cross-sectional study	Questionnaire	SPSS statistical software version 20 (p-value <0.05)	-----	92,7% (525 students)	92,7% (525 students)
10	Cross-sectional study	Questionnaire	SPSS statistical software (p-value <0.05)	-----	100%	100%
11	Cross-sectional study	Questionnaire	SPSS statistical software version 22 (p-value <0.05)	-----	100%	100%
12	Annual cross-sectional household survey	Data from Centers for Disease Control and Prevention's 2014 National Immunization Survey-Teen	STATA v14 software (p-value ≤ 0.05) Chi-square tests	-----	100%	13,25% (1688 teenagers)
13	Epidemiologic study	Questionnaire	SPSS statistical software version 18 (p-value <0.05)	-----	87% (4507 adolescents)	87% (4507 adolescents)

Table 2.

included. Studies that did not primarily target population groups eligible for HPV vaccine or their parents, or that did not subset outcomes in such a way that we were able to

extract data on these target groups, were excluded. A flow diagram of the search selection for the included studies according to the Preferred Reporting Items for Systematic

Reviews and Meta-Analysis (PRISMA) statement (16) is presented in Figure 1. An initial search of the literature revealed 656 articles on November 2019. Of these articles, 635 were excluded because they referred to HPV generally and not on the specific topics of the current review. After reading the title and the abstract, 21 articles were found of which, after reading the full texts, 13 articles were used for the study, as they met the inclusion criteria focusing on the awareness about HPV among adolescents and young adults, as well as their attitudes and willingness towards the HPV vaccine and the identification of the impact of health professionals and health education interventions on HPV awareness and attitudes towards HPV vaccine.

4. RESULTS

The following tables analyze the selected articles that meet the purpose of the study, after first presenting the search flow diagram (Figure 1).

4.1. Characteristics of the studies

From the 13 studies eligible for inclusion in the review (Table 1), five were carried out in the USA, four in Greece, while China, Malaysia, Italy, and Sweden had one study each. The number of study participants ranged from 34 to 12,742. The sample of the studies consisted of students, adolescents, young adults, school nurses, while one study focused on adolescents, young adults, and mothers of vaccine-eligible girls (Table 1). Ten studies assessed the level of knowledge and awareness of adolescents regarding HPV, three of the studies identified the attitudes and willingness towards the HPV vaccine, five studies identified the effect of educational interventions on HPV knowledge and one study evaluated the impact of health professionals on HPV vaccination (Table 3). Most of the studies used validated questionnaires while one study included interviews and discussion groups and one was a survey (Table 2). All studies, except one, stated the approval of their study by an Ethic Committee or an Institutional Board (Table 3).

4.2. Awareness-Knowledge of HPV and attitudes-willingness of HPV vaccine among adolescents and young adults

Ten studies examined awareness and knowledge of HPV among the target group. Nine of the studies showed low to moderate levels of awareness and knowledge, while only one specified high levels of knowledge. As far as it concerns attitudes and willingness, in one study the target group had a favorable attitude towards the HPV vaccination program, in another study the adolescents showed high willingness to get vaccinated, while in the third study the intention to get vaccinated was related to the psychological characteristics of the participants (Table 3).

4.3. Impact of health professionals and health education interventions on HPV awareness and attitudes towards HPV vaccine among adolescents and young adults

From the 13 identified studies, the 4 revealed that the role of health professionals was ineffective, while four studies focused on the impact of health education interventions and showed that interventions had a positive impact on knowledge and awareness of HPV. One of these four studies specified that the documentary was participants' preferred

health information communication option and another indicated the positive impact of providers' recommendation regarding vaccination (Table 3).

5. DISCUSSION

This review was conducted to investigate knowledge, attitudes, and behaviors of adolescents about HPV, as well as to identify the impact of health professionals and health education interventions on HPV awareness and attitudes towards HPV vaccine among this target group. More specifically, adolescents and young people, in general, are not very well informed about HPV and its effects, as well as about the HPV vaccine. In a study by Vaidakis et al. (2017), although more than half of the participants reported being aware of HPV or cervical cancer, most were unaware of their association and unable to respond to questions about HPV and vaccination.

Besides, in another Greek study by Anagnostou et al. (2017), there were low scores of Greek students' knowledge about HPV, as there was little information and encouragement about vaccination, as was also by the study of Efkarpidis et al. (2018). Moreover, in the study of Kasymova et al. (2019), there was a lack of knowledge about HPV vaccination, and in particular that it is necessary even for boys, as there was a belief that it is aimed only at women. Regarding the attitude of adolescents and young people towards HPV vaccination, the study by Scherer et al. (2018), showed that gender affects the motivation of adolescents. For women, the greatest interest and ability to understand health information seemed to distinguish between those who were vaccinated and those who were not. For men, less need for discussion and greater need for threats and uncertainty seemed to be the discreet motivation for those who reported receiving the HPV vaccine compared to those who did not. The results for vaccination intentions were less consistent but there was some evidence that regardless of gender, greater health and understanding and need to manage uncertainty and threats were associated with increased intent to receive the HPV vaccine. Parental vaccine hesitancy is strongly associated with adolescents not receiving HPV vaccination (30). Most literature addresses vaccine hesitancy problem among adults, in whom promoting change of attitudes toward vaccinations can be challenging. However, there is a suggestion to target children and adolescents (31).

The studies of this systematic review have shown that although the health education programs have a positive impact on adolescents' attitudes to vaccination, the role of health professionals is not very effective in informing and shaping the attitude and behavior of adolescents and young people against HPV. By reviewing HPV vaccination acceptance amongst mothers in Romania, a mistrust in doctors was reported because the mothers thought that they lack objectivity and they have commercial interests (32).

The study by Krakow et al. (2017), showed that although there were recommendations in adolescents about their HPV vaccination, boys, younger adolescents, and white adolescents were less likely to start vaccination. In this study, teens believed that the vaccine was not necessary, as they were concerned about its safety and lacked knowledge about

the vaccine, although they received recommendations from health care providers. The findings of the study by Boyd et al. (2018) were similar.

The study of Karamanidou et al., (2018) showed similar results. That is, adolescents had a vaccination dilemma because of the contradictory advice they received from health professionals in conjunction with the difficulties they encountered in evaluating relevant health information. Also, the study by Anagnostou et al. (2017), revealed the minimal role of physicians as informants and the minimal encouragement for vaccination.

The factors associated with refusing HPV vaccination are level of education, lower participation in a school seminar on HPV, and lower perception of the benefits of the HPV vaccine (26).

Also, the results of the study by Staples et al. (2018), state that the educational intervention used was successful in improving adolescents' knowledge about HPV and cervical cancer, as well as the intervention of Liu et al. (2019).

The research of Grandahl et al. (2017) on the opinion of school nurses who inform adolescents about HPV vaccination, most nurses agreed that they are in favor of HPV vaccination in girls and boys but need more training on HPV and vaccines.

The findings of Wong et al.'s (2019) research revealed a general lack of knowledge and misconceptions about the HPV virus and the HPV vaccine even in people who have been vaccinated. This suggests that accurate knowledge about HPV along with vaccine administration is essential.

6. CONCLUSION

The HPV and the infection it causes is a modern scourge that affects all people, especially young people and adolescents. The vaccine uptake is still low in various countries (33). The current study found that although adolescents intend to be vaccinated, they lack knowledge about vaccination, as well as the HPV virus and its side effects, as well as precautions against their transmissibility. Studies reported in this paper have shown that health education programs have a positive impact on adolescents' attitudes to vaccination. Policy makers can better design strategies to improve HPV vaccination in their local settings. The public health planning should focus on educating adolescents about HPV vaccination and should be tailored to the target community, depending on the socio-demographic characteristics of its members.

Although health education interventions improve the knowledge of young people about HPV and cervical cancer, health professionals fail to properly inform adolescents and their families about the negative effects of HPV and vaccination. Thus, continuous training of health personnel is also necessary. New studies are needed to identify barriers to adolescents not being vaccinated.

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