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

Maria Iliadou¹, Kalliopi Sahini³, Evanthia Sakellari², Maria Daglas¹, Eirini Orovou³, Georgios Iatrakis³, Evangelia Antoniou¹

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...
The aim of this review is, firstly, to systematically identify the studies that explore awareness about HPV among 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). 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

---

**Table 1.**

| Authors, Year of publication | Title of article | Country | Sample | Sampling method |
|-----------------------------|------------------|---------|--------|----------------|
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| A. Efkarpidis, G. Koulierakis, 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 |
| 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 |
| 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 |
| Krakow 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 |
| Vaidakis D, Moustaki I, Zervas I, Barbouni A, Merakou K, Chrysi MS, Creatsa G, Panoskaitiss T, (2017)29 | Knowledge of Greek adolescents on human papillomavirus (HPV) and vaccination: A national epidemiologic study | Greece | 4547 adolescents aged 17-18 years | purposive sampling |

---

this vaccine has been highlighted in the international literature (13-14).
Table 2.

| Type of research–Design | Research tool | Statistical analysis | Sample size per group | Response Rate | Follow up rate |
|-------------------------|---------------|----------------------|-----------------------|---------------|---------------|
| 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% |
| Cross-sectional survey | Questionnaires 1. Demographic data 2. HPV awareness, perceptions, and experiences 3. 18-item HPV knowledge scale | STATA, Chi-square tests | 70% (2,005 female students), 70% (2,005 female students) | 100% | 100% |
| Nationwide longitudinal survey | Questionnaires 1. Demographic data 2. Mean knowledge score of HPV infection | SPSS statistical software (p-value <0.05) | 22% (141 young adult women), 22% (141 young adult women) | 100% | 100% |
| 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 post-hoc and Mann-Whitney test (p < 0.1) | 79% (57 students), 79% (57 students) | 100% | 100% |
| Observational study | Questionnaires | SPSS statistical software (p-value <0.05) | 50% aged 18 – 21 years, 50% aged 22 – 26 years, 84% (1406 adults), 84% (1406 adults) | 100% | 100% |
| 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) | 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% |
| Cross-sectional study, qualitative methodology | Questionnaires 1. Demographic data 2. Knowledge item scale Intervention: Leaflet, an expert interview, Documentary | SPSS statistical software version 20 (p-value <0.05) | 92.7% (525 students), 92.7% (525 students) | 100% | 100% |

Table 2. What do Young People Think About HPV and HPV Vaccination? The Role of Health Education Interventions and Health Professionals

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-williness 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 discrete 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.

• Author’s contribution: (M.I.): conceptualization, design, analysis, writing, approving the final manuscript, supervision, (K.S.): conceptualization, data acquisition, design, analysis, writing, (E.S.): design, analysis, critically revised, (M.D.): design, analysis, (E.O.): design, analysis, (G.I.): design, analysis, critically revised (E.A.): design, analysis, critically revised

• Conflicts of interest: None declared. Financial support and sponsorship: Nil.

REFERENCES

1. Onon TS. History of human papillomavirus, warts and cancer: what do we know today? Best Pract Res Clin Obstet Gynaecol. 2011; 25: 565–574.

2. Herlitz CA, Forsberg M. Sexual behaviour and risk assessment in different age cohorts in the general population of Sweden (1989–2007). Scandinavian Journal of Public Health. 2010; 38(1): 32–39.

3. Du J, Nordfors C, Åhrlund-Richter A, Sobkowiak M, Romanital M, Násman A, et al. Prevalence of oral human papillomavirus infection among youth, Sweden. Emerging infectious diseases. 2012; 18(9): 1468–1471.

4. Grandahl M, Tydén T, Rosendal A, Oscarsson M, Neveus T, Stenhammar C. School nurses’ attitudes and experiences regarding the human papillomavirus vaccination programme in Sweden: a population-based survey. BMC Public Health. 2014; 14(1): 540.

5. Matteo M, Grün N, Rosenblad A, Larsson M, Häggström-Nordin E, Dalin T, et al. Sexual experiences in relation to HPV vaccination status in female high school students in Sweden. The European Journal of Contraception & Reproductive Health Care. 2014; 19(2): 86–92.

6. Marek E, Dergez T, Rebek-Nagy G, Kricskovics A, Kovacs K, Bozsó S, et al. Adolescents’ awareness of HPV infections and attitudes towards HPV vaccination 3 years following the introduction of the HPV vaccine in Hungary. Vaccine. 2011; 29(47): 8591–8598.

7. DiClemente RJ, Wingood GM, Sales JM, Brown JL, Rose ES, Davis TL, et al. Efficacy of a telephone-delivered sexually transmitted infection/human immunodeficiency virus prevention maintenance intervention for adolescents: a randomized clinical trial. JAMA Pediatrics. 2014; 168(10): 938–946.

8. Coyle KK, Glassman JR, Franks HM, Campe SM, Denner J, Lepore GM. Interventions to reduce sexual risk behaviors among youth in alternative schools: a randomized controlled trial. Journal of Adolescent Health. 2013; 55(1): 68–78.

9. Kwan TT, Tam KF, Lee PW, Chan KK, Ngan HY. The effect of school-based cervical cancer education on perceptions towards human papillomavirus vaccination among Hong Kong Chinese adolescent girls. Patient education and counseling. 2011; 84(1): 118–122.

10. Levine OS, Bloom DE, Cherian T, de Quadros C, Sow S. The future of immunisation policy, implementation, and financing. The Lancet. 2011; 378: 439–448.

11. Iatrakis G, Zervoudis S. Gynecological Oncology. 5th ed. Athens, Desmos Digital IKE; 2020.

12. Bednarczyk R, Ellington MK, Omer SB. Human Papillomavirus Vaccination Before 13 and 15 Years of Age: Analysis of National Immunization Survey Teen Data. Journal of Infectious Diseases. 2019; 220(5): 730–734.

13. Leask J, Kinnersley P, Jackson C, Cheater F, Bedford H, Rogers G. Communicating with parents about vaccination: a framework for health professionals. BMC Pediatrics. 2012; 12(1): 154.

14. Iliadou M, Vivilaki V, Gourounti K, Sarella A, Sahini K. Human papillomavirus-primary and secondary prevention measures. Epiteorese Klinikes Farmakologias kai Farmakokinetics.
What do Young People Think About HPV and HPV Vaccination? The Role of Health Education Interventions and Health Professionals

2020; 38(2): 119-124.

15. Woodhall, SC, Lehtinen M, Verho T, Huhtala H, Hokkanen M, Kosunen E. Anticipated acceptance of HPV vaccination at the baseline of implementation: a survey of parental and adolescent knowledge and attitudes in Finland. Journal of Adolescent Health. 2007; 40(5): 466-469.

16. Moher D, Shamseer L, Clarke M, Ghersi D, Liberati A, Petticrew M, et al. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. Systematic reviews. 2015; 4(1): 1.

17. Liu CR, Liang H, Zhang X, Pu C, Li Q, Li Q, et al. Effect of an educational intervention on HPV knowledge and attitudes towards HPV and its vaccines among junior middle school students in Chengdu, China. BMC Public Health. 2019; 19(1): 488.

18. Kasymova S, Harrison SE, Pascal C. Knowledge and awareness of human papillomavirus among college students in South Carolina. Infectious Diseases: Research and Treatment. 2019; 12: 117863718825077.

19. Wong LP, Alias H, Sam IC, Zimet GD. A nationwide study comparing knowledge and beliefs about HPV among female students before and after HPV vaccination. Journal of Pediatric and Adolescent Gynecology. 2019; 32(2): 158-164.

20. Boyd ED, Phillips JM, Schoenberger YMM, Simpson T. Barriers and facilitators to HPV vaccination among rural Alabama adolescents and their caregivers. Vaccine. 2018; 36(28): 4126-4133.

21. Restivo V, Costantino C, Fazio TF, Casuccio N, D’Angelo C, Vitale F, et al. Factors associated with HPV vaccine refusal among young adult women after ten years of vaccine implementation. International Journal of Environmental Research and Public Health. 2018; 15(4): 770.

22. Staples JN, Wong MS, Rimel BJ. An educational intervention to improve human papilloma virus (HPV) and cervical cancer knowledge among African American college students. Gynecologic oncology. 2018; 149(1): 101-105.

23. Scherer AM, Schacht Reisinger H, Schweizer ML, Askelson NM, Fagerlin A, Lynch CF. Cross-sectional associations between psychological traits, and HPV vaccine uptake and intentions in young adults from the United States. PloS one. 2018; 13(2): e0193563.

24. Karamanidou C, Dimopoulos K. 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. Health Psychology and Behavioral Medicine. 2018; 6(1): 180-202.

25. Efkarpidis A, Koulierakis G, Efkarpidis P, Sakellariou M, Taxidis A. Human papillomavirus related knowledge and beliefs among high school pupils in an island region in Greece. Archives of Hellenic Medicine/Arheia Ellenikes Iatrikes. 2018; 55(2).

26. Anagnostou PA, Aletras VH, Niakas DA. Human papillomavirus knowledge and vaccine acceptability among adolescents in a Greek region. Public Health. 2017; 152: 145-152.

27. Grandahl M, Larsson M, Tydén T, Stenhammar C. School nurses’ attitudes towards and experiences of the Swedish school-based HPV vaccination programme - A repeated cross sectional study. PloS one. 2017; 12(4): e0175883.

28. Krakow M, Beavis A, Cosides O, Rositch AF. Characteristics of adolescents lacking provider-recommended human papillomavirus vaccination. Journal of Adolescent Health. 2017; 60(5): 619-622.

29. Vaidakis D, Moustaki I, Zervas I, Barbouni A, Merakou K, Chrysi MS, et al. Knowledge of Greek adolescents on human papilloma virus (HPV) and vaccination: A national epidemiologic study. Medicine. 2017; 96(1): e5287.

30. Szilagyi PG, Albertin CS, Gurfinkel D, Saville AW, Vangala S, Rice JD, et al. Prevalence and characteristics of HPV vaccine hesitancy among parents of adolescents across the US. Vaccine. 2020; 38(58): 6027-6037.

31. Arede M, Bravo-Araya M, Bouchard É, Singh Gill G, Plajer V, Shehraj A, et al. Combating Vaccine Hesitancy: Teaching the Next Generation to Navigate Through the Post Truth Era. Frontiers in Public Health. 2019; 6: 381.

32. Craciun C. and Baban A. Who will take the blame?: understanding the reasons why Romanian mothers decline HPV vaccination for their daughters. Vaccine. 2012; 30(48): 6789-6793.

33. Loke AY, Kwan ML, Wong YT, Wong AKY. The uptake of human papillomavirus vaccination and its associated factors among adolescents: a systematic review. Journal of Primary Care & Community Health. 2017; 8(4): 349-362.