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QUANTITATIVE STUDY ON THE KNOWLEDGE AND ATTITUDES OF MEDICAL STUDENTS REGARDING HUMAN PAPILLOMAVIRUS (HPV) AND HPV VACCINATION IN GEORGIA

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ლუკა ნაჭყებია, ნატალი ფიცხელაური, ზურაბ ალხანიშვილი

სამედიცინო პროფილის სტუდენტების ცოდნისა და დამოკიდებულების რაოდენობრივი კვლევა ადამიანის პაპილომავირუსსა (აპვ) და მის ვაქცინაციაზე საქართველოში

ივანე ჯავახიშვილის სახელობის თბილისის სახელმწიფო უნივერსიტეტი, საქართველო

რეზიუმე

ადამიანის პაპილომავირუსი (აპვ) წარმოადგენს გავრცელებულ სქესობრივად გადამდებ ინფექციას (სგგი), რომელსაც გააჩნია მნიშვნელოვანი გლობალური ზემოქმედება. სამედიცინო პროფილის სტუდენტები არიან მომავალი ჯანდაცვის სერვისების პროვაიდერები, რომლებიც პასუხისმგებელნი იქნებიან პაციენტების განათლებაზე აპვ-ს შესახებ და ექნებათ მნიშვნელოვანი როლი მათთვის აპვ ვაქცინაციის რეკომენდირებაზე. კვლევაში გამოყენებულია ჯვარედინი კვლევის დიზაინი. მონაცემები შეგროვდა 2 თვის პერიოდში (მაისი-ივნისი, 2024). მონაცემთა ანალიზისთვის გამოყენებულია აღწერითი სტატისტიკა და მულტივარიანტული ბინარული ლოჯისტიკური რეგრესიის ანალიზი. კვლევაში გამოყენებულია 202 შევსებული კითხვარი. იმის მიუხედავად, რომ აპვ-ს რისკების მიმართ მაღალია ცნობადობა, განსაკუთრებით ქალებში, კვლევის დროს გამოვლინდა განათლების ნაკლებობა აპვ-ს კავშირთან სხვადასხვა ტიპის კიბოების მიმართ მამაკაცებში და ასევე ლიმიტირებულია ცნობადობა აპვ-ს პრევენციის მეთოდებზე. მონაწილეთა მნიშვნელოვანი ნაწილი გამოთქვამს შეშფოთებას ვაქცინის გვერდითი მოვლენების მიმართ და ემხრობა მისინფორმაციებს ვაქცინის უსაფრთხოებაზე. ბინარული ლოჯისტიკური რეგრესიის ანალიზმა გამოავლინა, რომ აპვ-ს მიმართ ჯანმრთელობის რისკების ცოდნა, განსაკუთრებით კაცებში არის ვაქცინაციის ინტენციის მნიშვნელოვანი პრედიქტორი. შედეგები ნათლად გვანახებს სამედიცინო პროფილის სტუდენტების აპვ-ს და მისი ვაქცინაციის მიმართ განათლების დონისა და დამოკიდებულების სურათს თბილისში, საქართველოში.

Introduction. Human Papillomavirus (HPV) is a pervasive sexually transmitted infection (STI) with a profound global impact. One of the most common STI worldwide, its prevalence is staggering, with nearly all sexually active individuals estimated to contract HPV at some point in their lives. A recent World Health Organization (WHO) study further underscores this ubiquity, revealing that one in three men worldwide are infected with genital HPV [1]. This alarming statistic highlights the urgent need for a comprehensive understanding of HPV, its associated health risks, and effective prevention strategies. The prevalence of HPV is exceptionally high, with estimates suggesting that 80% of sexually active individuals will acquire HPV by the age of 50 [2].

Georgia faces a significant burden of human papillomavirus (HPV) infection, with an estimated 1.1% of women harboring high-risk HPV strains. This has led to an annual incidence of 327 cervical cancer cases and 204 deaths, making it the fifth most frequent cancer among women in Georgia and the third most frequent among women between 15 and 44 years of age [3]. Notably, over 40% of cervical cancer cases are diagnosed in late stages (III and IV), highlighting the need for improved prevention and early detection strategies [4].

The prevention of HPV-related diseases relies on a multi-faceted approach that includes vaccination, screening, and education. The WHO recommends vaccinating girls aged 9 to 14 years, ideally before the onset of sexual activity, to maximize protection [5]. Regular cervical cancer screening is another

crucial component of HPV prevention and control. The Georgian government has implemented a national screening program offering free cervical cancer screening to women aged 25-60, and the HPV vaccine has been integrated into the national immunization schedule for girls aged 9-13, with a catch-up program for those aged 13-18 [6]. However, the estimated uptake of the HPV vaccine in the 9-14-year-old age group is only 19%, suggesting that the introduction of the vaccine has not been accompanied by sufficient education and awareness campaigns.

Medical students are future healthcare providers who will be responsible for educating patients about HPV and recommending vaccination. Studies have shown that medical students with adequate knowledge about HPV and vaccination are more likely to recommend the vaccine to their patients [7]. Furthermore, their attitudes towards vaccination, including their confidence in vaccine safety and efficacy, can influence their communication with patients and the effectiveness of their recommendations. However, research has also revealed gaps in medical students' knowledge about HPV and vaccination. A study conducted in Puerto Rico found that medical students had limited knowledge about the association between HPV and head and neck cancer [8]. Another study conducted in France found that less than half of the medical students surveyed knew that HPV could cause genital warts or oral cancers, and only 18% knew that there was no antiviral treatment for HPV [9]. These knowledge gaps highlight the need for comprehensive HPV education during medical training. The aim of this study is to evaluate the knowledge and attitudes of Medical Students regarding HPV and HPV vaccination.

Methodology. In this study, cross-sectional survey design was employed. Data were collected over a two-month period (May-June 2024). The self-administered structured questionnaire consisted of four sections with a total of 31 multiple-choice and 1 open ended question. Data were processed and analyzed using Statistical Package for the Social Sciences (SPSS) version 26. Descriptive statistics, including frequencies and percentages for categorical variables, were employed to summarize participant characteristics and key responses. Furthermore, a multivariate binary logistic regression analysis was performed to delve deeper into the complex interplay of multiple factors influencing vaccine acceptability. The Survey and research protocol received ethical approval from NCDC IRBN. Prior to completing the questionnaire, all participants provided informed consent, ensuring their voluntary participation and awareness of the study's purpose and procedures. Furthermore, the survey instrument was designed to avoid collecting any personal identifiers, ensuring participant anonymity and data confidentiality.

Results. A total of 202 questionnaires was used for the analysis. The great majority (67.8%) of study participants were female. The age distribution was as follows: the most common age group among research participants was 20-22 (40.1%), the second most frequent age group was 22-24 (34.2%), the third most frequent was 18-20 (13.9%), followed by 24-26 (9.4%), and the least frequent age group was 26+, comprising only 2.5% of the total study population. The most common faculty/program enrolment was medicine 55.9% (n=113), followed by dentistry 29.7% (n=60), and public health 13.4% (n=27). Most medical students (60.9%) had received at least one vaccine, either for HPV, influenza, or both. Among those vaccinated, the most common status was "Flu" (26.2%), followed by "Both" (14.9%) and "HPV" (7.4%). A significant proportion (39.1%) had not received any vaccinations, and 12.4% were unsure of their vaccination status.

Most participants (182) correctly identified HPV as a virus (90.1%). A small proportion (13) mistakenly classified HPV as a bacterial infection (6.4%), A small number of participants associated HPV with genital yeast infection (1) or genital tissue degeneration (2), while 4 participants (2.0%) expressed uncertainty. Most respondents (86.6%) correctly identify sexual activity as a mode of HPV transmission. A significant proportion (19.3%) believe that HPV is transmitted through skin-to-skin contact, while a

smaller percentage (7.9%) incorrectly believe it is airborne. 2.5% of respondents believe that HPV cannot be transmitted between humans. 53.0% of respondents (107 students) accurately identified that HPV can cause both cervical and several other types of cancer, as well as genital warts. Less than half of the students (45.5%) correctly identified that HPV increases the likelihood of developing cancer in men. A significant number of students (33.7%) believed that HPV is asymptomatic in men and has no associated complications.

Most students (73.8%) were correct and identified that both vaccination and safe intercourse practices are important for HPV prevention. A small proportion (19.8%) believed that vaccination is the primary prevention method, while an even smaller percentage (3.5%) thought that safe intercourse practices are more important. The most common source of information was university (50.5%), followed by social media (40.6%) and other internet resources (37.1%), doctors (20.8%), non-governmental organizations (20.8%), and friends or family (17.3%). 86.1% of the students were correct and identified that the HPV vaccine is available. A small percentage (7.9%) believed that the vaccine is still in the research stage and not recommended for use, while an even smaller amount (1.0%) believed that the vaccine is not available. Less than half of the students (44.1%) were correct and identified that the HPV vaccine is administered to both uninfected and infected individuals. A little over a third of the students (34.2%) believed that a Pap test is necessary before HPV vaccination to determine infection status. A small percentage (12.4%) believed that the vaccine is pointless for sexually active individuals because they may already be infected. Most students (71.3%) correctly agreed that HPV vaccination is effective after sexual activity, while only 14.4% disagreed. A significant proportion (14.4%) were unsure. Over half of the students (55.9%) were correct and identified 9-12 years as the optimal age range. But a significant proportion (34.2%) believed that the optimal age is 18-19 years, while a small percentage (3.0%) thought it was 5-6 years. Over half of the students (56.4%) correctly identified that HPV vaccination both reduces the chance of infection and the probability of developing cancer in an infected person. Nearly a third of the students (33.2%) recognized that the vaccine reduces the chance of infection but did not acknowledge its role in reducing cancer risk. 40.6% of the students incorrectly agreed with the statement that HPV vaccination can cause HPV infection, while 41.6% disagreed. Over a quarter of the students (26.7%) did not know the common side effects of the HPV vaccine in men. The most common source of information was university (39.1%), followed by social media (37.6%) and other internet resources (38.1%), friends or family (19.8%), and non-governmental organizations (22.8%).

Less than half of the students (46.5%) agree that HPV poses a serious risk, with a further 29.7% strongly agreeing. When considering the safety of the HPV vaccine, 45.0% of students agree that it is safe, and 27.7% strongly agree, though 17.3% remain neutral. In terms of vaccination intentions, 38.6% of students agree that they intend to get vaccinated, while 29.7% strongly agree, and 22.8% are neutral about their intentions. Regarding the perception of safer alternatives to the HPV vaccine, 51.5% of students disagree that there are safer options, and 21.8% strongly disagree, with 18.8% holding a neutral position. When it comes to recommending the HPV vaccine to others, 44.1% of students agree that they feel comfortable doing so, and 29.2% strongly agree, while 22.3% are neutral. Confidence in recommending the vaccine is also reflected by 50.5% of students agreeing, and 27.2% strongly agreeing, though 17.8% remain neutral. Concerns about potential side effects show that 41.1% of students are neutral, 23.3% agree, and 18.3% disagree that they are concerned about these effects. Additionally, 36.6% of students agreed that their university education about HPV was adequate, with 27.2% remaining neutral. In terms of the accessibility of information on HPV, 46.0% of students agree that the information is easily accessible, and 16.8% strongly agree, though 22.8% are neutral. Confidence in engaging in discussions with vaccine

opponents is shown by 40.6% of students agreeing that they feel confident in such discussions, with 27.7% remaining neutral, 22.8% strongly agreeing, and 8.9% disagreeing.

A binary logistic regression model was employed to examine the relationship between knowledge about HPV and the intention to get vaccinated. The model was found to be statistically significant ($\chi^2(5) = 23.989$, $p < .001$), supporting the hypothesis that knowledge about HPV plays a role in predicting vaccination intention. However, the model's overall predictive power was moderate, with Cox & Snell $R^2 = .112$ and Nagelkerke $R^2 = .157$, suggesting that the included knowledge factors accounted for 11-16% of the variance in vaccination intention. This indicates that other factors not considered in the model also contribute significantly to this decision.

Among the knowledge factors examined, knowledge of HPV health risks in men (Exp(B) = .288, p<.001) and knowledge of general HPV health risks (Exp(B) = .478, p = .026) emerged as significant predictors. Notably, individuals who demonstrated knowledge in these areas were significantly more likely to report an intention to get vaccinated. Specifically, participants aware of the health risks in men exhibited 71.2% lower odds of not intending to get vaccinated, while those aware of the general health risks demonstrated 52.2% lower odds of not intending to get vaccinated. Interestingly, knowledge about HPV prevention methods, HPV transmission, and the nature of HPV did not significantly predict vaccination intention in this model. This finding underscores the importance of focusing educational efforts on the dissemination of accurate information about the health risks associated with HPV, particularly for men, to potentially increase vaccination uptake.

Discussion. The current study's findings underscore the significant role that medical students can play in promoting HPV vaccination and education. As future healthcare providers, their knowledge and attitudes towards HPV and its vaccine are crucial in shaping public health outcomes. However, the results also highlight the need for enhanced educational strategies to address knowledge gaps and misconceptions among medical students. The study revealed a high level of awareness regarding the viral nature of HPV and its transmission through sexual activity, aligning with findings from other countries [8,9]. This suggests that basic information about HPV is effectively disseminated in educational settings. However, the persistence of misconceptions about transmission routes, such as skin-to-skin contact and airborne transmission, underscores the need for targeted education to dispel these myths and reinforce accurate knowledge.

While most participants recognized the association between HPV and cervical cancer, there was a concerning lack of awareness regarding HPV's link to other cancers, particularly in men. This finding is consistent with studies conducted in various countries, indicating a widespread knowledge gap regarding the full spectrum of HPV-related diseases [7,10]. This gap is particularly significant given the rising incidence of HPV-related oropharyngeal cancers and the importance of vaccination for both sexes. Educational efforts should prioritize raising awareness about the diverse manifestations of HPV infection and the importance of vaccination for all individuals, regardless of gender. The study also revealed a limited understanding of HPV prevention methods, with a significant proportion of participants focusing solely on vaccination or safe sexual practices. This finding suggests a need for comprehensive education that emphasizes the importance of a multi-faceted approach to HPV prevention, encompassing both vaccination and safe sexual behaviors.

Vaccine hesitancy emerged as a significant concern in this study, with a substantial proportion of participants expressing concerns about side effects and misconceptions about vaccine safety. This finding aligns with global trends of vaccine hesitancy, which poses a significant challenge to public health efforts [11]. The sources of information about HPV and its vaccine also played a crucial role in shaping attitudes,

with those who received information from universities and doctors demonstrating higher levels of knowledge and more positive attitudes towards vaccination. This highlights the importance of healthcare providers and educational institutions as trusted sources of information and emphasizes the need for clear, evidence-based communication to address concerns and promote vaccine acceptance. Furthermore, the binary logistic regression analysis revealed that knowledge of HPV-related health risks, particularly in men, was a significant predictor of intention to get vaccinated. This finding underscores the importance of focusing educational efforts on the dissemination of accurate information about the potential consequences of HPV infection, especially for men, to potentially increase vaccine uptake.

Conclusion. Despite the limitations of this study, including the limited sample size and potential for selection bias, the findings provide valuable insights into the knowledge and attitudes of medical students towards HPV and its vaccination in Tbilisi, Georgia. These insights can inform the development of targeted educational programs and public health campaigns to address knowledge gaps, dispel misconceptions, and promote vaccine acceptance. By empowering future healthcare providers with accurate information and positive attitudes towards vaccination, we can contribute to the prevention of HPV-related diseases and improve public health outcomes in Georgia.

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SUMMARY

Human Papillomavirus (HPV) is a pervasive sexually transmitted infection (STI) with a significant global impact. Medical students are future healthcare providers who will be responsible for educating patients about HPV and recommending vaccination. The aim of this study is to evaluate the knowledge

and attitudes of Medical Students regarding HPV and HPV vaccination. In this study, cross-sectional survey design was employed. Data were collected over a two-month period (May-June 2024). Descriptive statistics and multivariate binary logistic regression analysis was performed to analyze the data. Totally 202 filled questionnaires were used for this study. Despite being aware of HPV's risks, particularly in women, there was a notable lack of awareness about its link to other cancers in men and limited understanding of HPV prevention methods. A substantial proportion of participants expressed concerns about vaccine side effects and held misconceptions about its safety. The binary logistic regression analysis identified that knowledge of HPV-related health risks, especially in men, was a significant predictor of the intention to get vaccinated. The findings provide valuable insights into the knowledge and attitudes of medical students towards HPV and its vaccination in Tbilisi, Georgia.

Keywords: HPV Knowledge, HPV Vaccination, HPV Attitudes, Medical Students, Georgia