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HEALTH EDUCATION INTERVENTION TO IMPROVE HPV KNOWLEDGE IN SEXUALLY ACTIVE YOUNG PEOPLE

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ABSTRACT

Human papillomaviruses are the most common sexually transmitted pathogens worldwide and some of them are associated with several cancer types. We conducted an educational program at the Messina University Hospital, Italy, by enrolling a group of sexually active young people and administering a pre and post-educational intervention questionnaire about HPV infection. The sample was made up of 100 subjects (75% belonging to male sex) with a mean age of 28 years old. The vast majority (87%) admitted to risky sexual behaviours. The pre-intervention questionnaire revealed that only about 50% of the group were aware of HPV and related diseases and less than 50% knew that there is a vaccine. Awareness reported in the second questionnaire post intervention was significantly higher than previously. Our data show that, in some particularly at risk groups, there is still a lack of awareness about HPV and that it is therefore necessary to carry out large sex education programs especially involving adolescents and the "at-risk" population.

1. Introduction

Human papillomaviruses (HPVs) are responsible for the most common sexually transmitted infections (STIs) (1) and some of them are associated with several cancer types, among which those of the cervical, ano-genital and head-neck districts are the most studied (2-10). There are more than 100 HPV genotypes classified according to "high" and "low" risk based on their ability to cause benign or malignant lesions (11). In 2017, the American Association for Cancer Research (AACR) established that pathogens are the third leading cause of cancer worldwide and, in particular, HPV is responsible for 30% of infection-related cases of cancers, preceded by *Helycobacter pylori* (32.5%) and followed by HBV and HCV (29.5%) causing up to 10-15% of all human cancers (12).
The recent GLOBOCAN (GLOBal CANcer observatory) report estimated an age-standardized incidence rate (ASR) of cervical cancer in Italy of 7.1 per 100.000, considering it to be among the countries with the lowest incidence (<7.3) (13). HPV infection can occur at any age and has been reported even in healthy young children (14).
It has been demonstrated that the risk of contracting the infection is associated with the number of sexual partners over a lifetime (15).
HPV infection can lead to a complex process of carcinogenesis that is not always followed by the onset of cancer. The inflammatory process promotes the integration of HPV-DNA causing genomic instability and increased susceptibility to DNA damage (16).
Among the methods used to prevent HPV infection, vaccination is surely the most important. To date, the Food and Drug Administration (FDA) has approved three different vaccines that prevent the burden of HPV-related infection: a tetravalent (2006), a bivalent (2009) and a nonavalent vaccine (2014). All the three vaccines prevent infections caused by HPV types 16 and 18, the two widespread high-risk HPVs causing about 70% of cervical cancers and a high percentage of some of the other HPV-related malignancies (17). Increasing HPV vaccination coverage could remarkably reduce the burden of these types of malignancies. Particularly, the spread of HPV vaccination is potentially able to reduce cervical cancer incidence worldwide up to 90% (18). However, the acceptance of this vaccination by the general population is still rather poor, as demonstrated by previous studies (19,20).

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A population particularly at-risk of contracting oral and/or genital HPV, as well as some other infections (21-23), are people living with HIV/AIDS (PLWHAs).

This study was aimed to evaluate the short-term effectiveness of a health education intervention about HPV infection in a population at risk of contracting the virus. The enrolled subjects were those coming to our observation to undergo an HIV screening test mainly due to at-risk sexual behaviours.

2. Methods

Study design

The survey was conducted in the period April-May 2019 on subjects who spontaneously came to the HIV screening laboratory of the Messina University Hospital "G. Martino" to undergo the HIV screening test. On this occasion, we asked subjects to participate to our investigation. We did not introduce eligibility criteria because we decided to consider all the subjects that came to our observation regardless of age and gender. The only adopted exclusion criterion was a known positive history of HPV infection.

A written informed consent form, and a brief anonymous pre-intervention questionnaire were administered by trained healthcare workers involved in the study.

The pre-intervention questionnaire investigated socio-demographical data (age, gender, education level) and knowledge of clinical aspects, routes of transmission and prevention of HPV disease.

After administration of the questionnaire participants were informed about HPV infection (epidemiology, transmission route, clinical features, diagnosis and prevention) through a face-to-face education intervention. At the end of the session, an informative brochure containing all the information given orally was provided to all participants. A second anonymous questionnaire (post intervention) to evaluate the efficacy of the education program (containing the same questions of the first plus some questions about the satisfaction degree of the educational intervention), was administered at the time of collection of HIV screening test result.

Statistical analyses

All the obtained data were collected and analysed with Prism 4.0 software. Descriptive statistics were used to find the percentages and the 95% Confidence Interval (CI). McNemar test was used for the comparison between the answers (pre- and post-education program). The role played by the independent variables (age, sexual orientation, education level) in the effectiveness of the program was assessed using nonparametric Spearman test. Significance was assessed at the $p<0.05$ level.

3. Results

In the two-month period of the study, a total 112 subjects were asked to participate: of them, 100 decided to adhere (response rate 89.3%). The participants were mainly men (75%) and of Italian nationality (96%), with a mean age of 28 (± 8.5) years old. Concerning sexual orientation, 54% declared that they were heterosexuals and 46% homo-bisexuals.

Moreover, 87% declared risky sexual behaviours (unprotected sex and/or multiple partners). Finally, concerning education level, 4.1% had completed middle school, 62.5% had a high school diploma, 29.2% had a scientific degree and 4.2% had a humanistic degree.

Table 1 shows the questions regarding all aspects of HPV infection reported in both pre and post intervention questionnaires. By comparing the answers, a significant improvement was reported in all the answers, with the exception of the question regarding knowledge of warts and condylomas, which were already known by 79% (95% CI 75-85) of the sample in the pre-intervention survey.

	Pre-intervention questionnaire % (IC 95%)	*Post-intervention questionnaire % (IC 95%)*	*p-value*
DO YOU KNOW HPV?			
Yes	58% (54-62)	96% (94-98)	<0.01
No	42% (38-46)	4% (0-9)	
DO YOU KNOW HOW THE INFECTION IS CONTRACTED?			
Yes	46% (40-52)	98% (96-100)	<0.01
No	54% (49-58)	2% (0-6)	
DO YOU KNOW WHAT ARE WARTS AND CONDYLOMAS?			
Yes	79% (73-86)	94% (90-98)	<0.05
No	21% (15-28)	6% (2-10)	
HAVE YOU EVER MADE AN HPV SCREENING?			
Yes	5% (0-9)	//	
No	95% (89-98)	//	
DO YOU KNOW THAT A VACCINE IS AVAILABLE TO PREVENT HPV INFECTION?			
Yes	43% (38-49)	92% (86-99)	<0.01
No	57% (51-62)	8% (3-12)	
HAVE YOU EVER MADE THE HPV VACCINATION?			
Yes	4% (0-9)	//	
No	96% (91-100)	//	

Table 1. Knowledge and attitudes about HPV infection and preventive strategies reported at pre- and post-intervention questionnaires.

Figure 1 shows the results of the satisfaction questionnaire administered at the end of the post-educational questionnaire. Of note, 62.5% (95% CI: 58-79) of the subjects stated that they had acquired knowledge (p-value <0.05) about all the aspects of HPV infection, 79% (95% CI: 73-86) stated that the educational program allowed them to understand risky behaviours and eventually to modify them. Finally, 75% (95% CI 72-80) declared that they intend to have the vaccination in future.

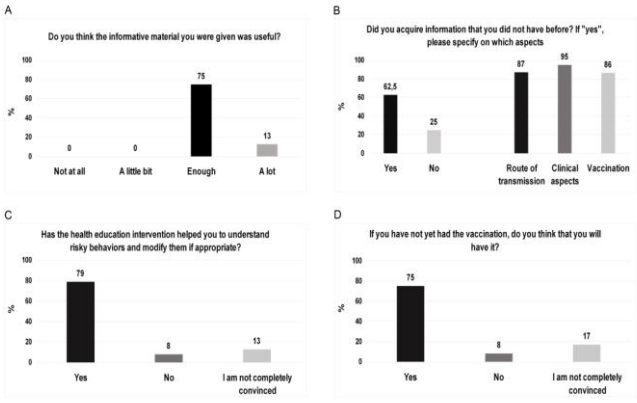

Figure 1. Satisfaction rate of the study participants about the health education intervention (A-B), and purpose to modify risk behaviors (C) and to make HPV vaccination in the future (D).

To better evaluate the independent variables that most influenced the effectiveness of the health education intervention, Spearman's rank correlation coefficient was calculated (Table 2).

	Satisfaction	*Knowledge of HPV infections*	*Knowledge of HPV clinical signs*	*Knoledge of HPV prevention*	*Risky behaviours*
Homosexual/ bisexual habit	0.188	0.691	**0.010**	**<0.001**	0.812
Older age	**<0.001**	**<0.001**	0.410	0.793	**0.003**
Higher educational level	0.128	0.443	0.432	0.139	0.349

Table 2. Correlation of the independent socio-demographic variables and efficacy of the conducted health education intervention (Spearman's rank test).

4. Discussion

Nowadays, HPV infection represents one of the primary problems and challenges to public health worldwide. Sexual promiscuity is surely one of the most important risk factors, in determining the transmission of HPV and, consequently, its spread in the community (24). It has been demonstrated that HPV prevalence is greater at younger ages (15–25 years) with the initiation of sexual activity; later, between 25–40 years of age, there is a marked decrease, after which the prevalence stabilises (25). However, the persistence among those aged 25-40 years is higher and this results in an increased risk of pre-neoplastic lesions (26). Previous studies showed that women with cervical lesions have a higher persistence of oral HPV than the general population and so this category could play an important role in HPV spread (27).

Our study was carried out in a population particularly at risk of contracting HPV due to the high percentage of subjects who admitted to risky sexual behaviours.

The HIV laboratory of the Messina University Hospital "G. Martino" is one of the reference centres for the surveillance of HIV infection in Sicily and, since its establishment, it has carried out a number of surveillance studies regarding the spread of this infection in particular, and also in general, about STIs in our territory (28-30). Generally, volunteers come to our centre to undergo HIV screening because of at-risk sexual behaviour. The screening test is preceded by a counselling activity during which the counsellor confirms the real risk of infection. During the session, information concerning sex, age, place of birth, occupation, sexual habits and possible exposure to risk (accidental bites, tattoos, drugs, piercing and unprotected intercourse) are collected. We decided to take advantage of this opportunity to carry out the educational program on HPV.

Our results show a lack of knowledge concerning all aspects of the HPV infection, including the route of transmission, the clinical aspect and, especially, the availability of an effective preventative vaccine. The latter aspect is particularly alarming and is evidenced by the very low percentage of subjects who declared that they had had the HPV vaccination. The reason for this finding could be linked to the fact that our sample was predominantly made up of men who, traditionally, do not consider themselves a target for this infection and consequently do not consider it necessary to undergo HPV vaccination, as is shown in previous studies (31). Actually, some authors have shown that HPV prevalence rates in men are not low (32).

The very low declared vaccine take up is in line with the national and local data of HPV vaccination coverage.

Indeed, the national data about this vaccine, updated at December 31, 2017 (2005 cohort) reported that the coverage was 64.3% for the first dose and 49.9% for the full cycle in girls and they confirm a negative trend already observed in previous years (33). Particularly, Sicily is last on the list of the Italian regions with a vaccine coverage rate of only 23.3% for the cohort 2005 (34, 35). The prevailing male composition of the sample could also be the cause of the very low percentage of declared previous HPV screening, traditionally a prerogative of women rather than men.

The statistical analyses highlight that the most important variables influencing the efficacy of the health education intervention were age, cultural level and sexual orientation. Indeed, the subjects on which the intervention was more effective were older, with a high cultural level and homo-bisexuals. The latter, probably, are more conscious of the risk represented by STIs as shown by the remarkable percentage of homo-bisexual subjects that came to our laboratory to undergo the HIV screening test.

The very high percentages of correct answers given in the second questionnaire show that oral and written information provided to each subject represented an effective health education intervention.

Moreover, the majority of the participants considered the program useful and they stated that it induced them to modify their risky sexual behaviours and to undergo the vaccination. However, because the study was a short-term educational program without the possibility of follow-up meetings with the participants, it was not possible to assess whether the educational program was actually effective in reducing risky sexual behaviour and, above all, convincing subjects to be vaccinated.

Moreover, in the future the role of the offer of HPV vaccination could be taken into account in Sicily as a determinant of vaccination adherence for subjects at risk (36).

5. Conclusions

Results of our study confirmed a rather poor knowledge of HPV especially among people with risky sexual behaviours that are at higher risk of contracting HPV infection. Moreover, our investigation highlights the importance of health educational programs to improve knowledge and perceptions of HPV infection and related disease and to promote HPV vaccination. Healthcare workers, as demonstrated previously in several studies, should play the most important role in spreading the correct information about HPV infection and preventive strategies according the current Italian Plan for Vaccine Prevention 2017-2019 (37-39)

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