

Validation of a questionnaire for young women to assess knowledge, attitudes and behaviors towards cervical screening and vaccination against HPV in Italy

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ABSTRACT

BACKGROUND: Despite knowledge about HPV may be an important determinant for vaccine acceptance and uptake, only few studies have assessed HPV-related knowledge in young females.

The aim of this study was to assess the reliability and validity of the questionnaire, in Italian women ≥ 18 years old, as a tool to examine knowledge, attitudes and behaviors towards screening and vaccination against HPV and reliable source of information.

METHODS: The questionnaire was administered to 30 girls in anonymous, voluntary and self-administered form with close-ended type of questions, except for the socio-demographic characteristics. It was composed in 3 sections for a total of 69 items. Participation in the study was entirely voluntary and anonymous. Descriptive analyses were performed using frequencies, percentages, and frequency table for categorical variables. Reliability analysis was tested and content validity was evaluated using Cronbach's alpha to check internal consistency and avoid misinterpretation of the results. The study was conducted in 4 Italian cities: Ferrara, Rome, Cassino and Palermo, to represent the different Italian geographical areas and knowledge, attitudes and behaviors towards screening and vaccination against HPV and reliable source of information. Data were collected in October 2010. Statistical analysis was performed with the statistical software for Windows SPSS, version 19.0.

RESULTS: The highest value of Cronbach's alpha resulted on 24 items ($\alpha = 0,774$); the addition of other items, one at a time, decreased the value. Cronbach's alpha on all the 3 sections together resulted in a value of 0,059. Young women generally knew that HPV can cause cervical cancer (93.3%) and genital warts (16.7%) and 76.7% of them recognized Pap-test as a screening tool. The main sources of information about HPV vaccination are represented by magazines / books (33.3%), TV (26.7%), and gynecologists (23.3%).

CONCLUSIONS: This pilot study demonstrated that a short version of the questionnaire has very good reliability properties in the study and this needs to be taken into account for future studies.

Key words: survey, HPV, young women, Cronbach's alpha, validation

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BACKGROUND

Human papillomaviruses (HPVs) are double-stranded DNA viruses belonging to the *papillomaviridae* family, with tropism for squamous epithelium. Over 120 types of HPV have been identified and approximately one third of these infect the squamous epithelia of the genital tract [1]; the viruses are the causative agents of over 99% of cervical cancers, which is the second largest cause of cancer deaths in women [2].

The types 16 and 18 causes up to 70% of cervical cancers worldwide and the majority of HPV-related precancerous lesions in other parts of the body, while HPV types 6 and 11 have been implicated in 90% of cases of genital warts [3].

The prevalence of HPV infection in women, according to data from 59 countries, ranges from 2% to 44% depending on the geographic region, the population sampled and the method of analysis [4].

In Italy, studies in women aged between 17 and 70 years, during routine gynecological tests or screening programs, showed a prevalence for any type of HPV between 7 and 16%; if women have abnormal cytology the prevalence increases to 35-54%, and 96% in case of severe dysplasia or beyond [5]. Genital HPV infection is relatively high with a prevalence of 24.1% among sexually active Italian women aged less than 25 years [6].

The HPV vaccine may have a substantial role on public health worldwide [7] and may reduce significantly the incidence of cervical cancer protecting against infections [8].

The Pap-test is an effective preventive measure in reducing cervical cancer incidence and mortality, it is recommended by the EU commission guidelines, which also recommend implementing organized screening programs, because they assure quality control, timeliness of testing, and equity of access to care [9]. In accordance with international guidelines, in Italy the Pap-test is recommended every three years for women between 25 and 64 years. Screening programs adherence has increased over the years, however, the invitation rate remains insufficient (38%) compared to the levels recommended by the European Guidelines and the National Commission cancer (85% of target). Moreover, there are important geographical variations, with a decreasing trend from North to South of Italy

(46% in the North, 36% in Central, 24% in the South) [10]. It should be noted that many women perform a Pap-test, even without participating in organized screening programs. A study shows that 78% of women, that ought to be involved in screening programs, have had a Pap-test as a preventive measure and 70% of them within the last three years [11].

Despite knowledge about HPV may be an important determinant for vaccine acceptance and uptake [12-13], only few studies have assessed HPV-related knowledge in young female [14-16].

Research is needed to fill the gaps in knowledge and perception about the HPV vaccination, it is not clear if young women understand the purpose of the Pap test, regardless of recent advancements and national attention over cervical cancer prevention.

The aim of this pilot study is to evaluate the reliability and validity of the questionnaire in young women (≥ 18 years) as a tool to assess knowledge, attitudes and behaviors towards primary (anti-HPV vaccination) and secondary (Pap-test screening) prevention of cervical cancer.

METHODS

Study population

We administered an ad hoc questionnaire, as a tool for the pilot study, among an Italian sample of 30 young women ≥ 18 years. Questionnaires were anonymous and self-administered with close-ended type of questions, except for the socio-demographic characteristics (father/mother employment, nationality, religion, residence). Participation in the study was completely voluntary.

The respondents were selected with opportunistic sampling in waiting rooms of the Local Health Unit, before the vaccination, and in university classrooms of four Italian cities enrolled in the study. The survey included 30 young women in order to verify the validity and reliability of the questionnaire. The survey was carried out in 4 Italian cities -Ferrara, Rome, Cassino, Palermo- in a multicenter study funded by the Ministry of Research (Progetto di Ricerca di Interesse Nazionale, PRIN 2008). The regions of the participating Universities where selected to

be as representative as possible of the different Italian geographical areas relatively to knowledge, attitudes and behaviors towards screening and vaccination against HPV and reliable source of information. Data were collected in October 2010.

The survey has been approved by the local ethical committee.

Questionnaire

The full version of the questionnaire comprehends three sections and includes 69 items.

The first section on anti-HPV vaccine deals with knowledge about diseases related to HPV infection, vaccination as a measure of primary prevention, information sources and methods of contraception.

The second section investigates knowledge and attitudes towards the Pap-test and the gynecologist-patient relationship.

The third and final section includes socio-demographic data (age, educational level, current occupation, father's/mother's profession, nationality, religion and region of residence).

The questions were all closed-ended except for socio-demographic characteristics (father's/ mother's profession, nationality, religion and residence). Table 1 illustrates the items of the questionnaire.

Statistical analysis

Data entered into a database using the program DB IV were processed with the statistical software SPSS 19.0 for Windows.

Descriptive analyses were performed using frequencies, percentages, and frequency table for categorical variables (Table 2).

Cronbach's alpha was used as a measure of the internal consistency that refers to the degree of correlation between the items, belonging to each of the 3 sections of the questionnaire and forming a scale. In each domain of the questionnaire, the items should be correlated moderately with each other but should contribute independently to the overall score in that domain.

When the Cronbach's alpha is 1, it means that questions are measuring an almost identical construct, resulting redundancy. Generally, an alpha value of 0.7 is considered acceptable [17].

In addition, a reliability analysis was performed to examine whether any item was not consistent with the rest of the scale, and thus could be discarded. The item-total correlation and the variability of the alpha between items in each section, adding and eliminating items of each section one at a time, was performed.

RESULTS

Validation of the questionnaire

The highest value of Cronbach's alpha resulted on 24 items ($\alpha = 0,774$) (Table 3a). The addition of other items, one at a time, reduced the alpha value. Cronbach's alpha resulted in a value of 0,713 on 41 items (Cronbach's alpha of 0,7 is the minimum value to be considered acceptable). When other items were added, for a total of 69 items, Cronbach's alpha decreased to 0,059, meaning that the full version of the questionnaire has an unsatisfactory internal validity.

Reliability analysis and item-total correlation and variability of Cronbach's alpha, if one item was deleted are shown in Table 3.

Sociodemographic characteristics of the sample

The sample consisted of 30 young women (≥ 18 years). About 50% resides in Southern Italy and 100% of the sample is Italian; also, 70% declared to be catholic.

Fathers' professions are: civil servant (43.6%), self-employed (20%), retired / unemployed (16.7%) and health professionals (16.7%).

Mothers of young vaccinated women are public employees (36.7%), self-employed (13.3%), housewives / unemployed (30%) and health professionals (20%) (Table 2).

Knowledge

Concerning knowledge about prevention of cervical cancer, 76.7% of young women recognize Pap-test as a screening tool; 43.3% of the sample believes that only females should be vaccinated. On the other hand, both genders should be vaccinated according

TABLE 1

HPV QUESTIONNAIRE ADMINISTERED TO 30 GIRLS	
QUESTIONS	ANSWERS
HPV VACCINATION	
D1) Which diseases are related to papilloma virus?	D1a Cervical cancer D1c Genital warts D1e Oral cancer D1g Recurrent cystitis D1i I don't know (specify)..... D1b Bladder cancer D1d Irritable bowel D1f Esophageal cancer D1h Anal cancer D1l Something else
D2) Who informed you of the HPV vaccination?	D2a General practitioner D2c Friends D2e TV D2g Magazines (specify)..... D2b Gynecologist D2d Radio D2f Web D2h Something else
D3) Who should provide the vaccine against HPV?	D3a Payed by the society D3b Partially payed by the society D3c At partial load of those who want to vaccinate D3d I don't know D3e Something else (to specify).....
D4) In case you want to vaccinate against HIV, how would you behave toward screening (pap test) for cervical cancer?	D4a I won't get a pap smear after vaccination D4b However, I'll get a pap smear D4c I don't know D4d Something else (to specify).....
D5) When should someone get vaccinated against HPV?	D5a Before the first sexual intercourse D5b If you think you may have occasional partners D5c If you have had more partners D5d After the first intercourse D5e Anytime D5f Something else (specify).....
D6) At what age should someone undergo HPV vaccination?	D6a 11-13 years D6c 18-21 years D6g All ages D6f Something else (specify)..... D6b 14-17 years D6d 22-26 years
D7) Who should be vaccinated?	D7a Male D7c Male and Female D7b Female
IF YOU'VE ALREADY HAD SEXUAL INTERCOURSE ANSWER THE NEXT FOUR QUESTIONS	
D8) How often do you have sexual intercourse?	D8a Once a week D8c More than two times per week D8e Less than once per month D8b Twice a week D8d Once / twice a month D8f Never (go to question 24)
D9) How many partners did you have in the last 3 years?	D9a 1 D9c 3 or more D9b 2
D10) What contraceptive methods do you use?	D10a None D10c Billings method D10e Coitus interruptus D10g Condom D10b Contraceptive pill D10d Spiral D10f Basal temperature D10h Diaphragm
D11) In which circumstances do you use condom?	D11a Always D11c In occasional intercourses D11b Never
PAP-TEST SECTION	
D12) Do you know Papanicolau test (pap test)?	<input type="checkbox"/> Yes <input type="checkbox"/> No
D13) Have you ever done a pap test?	<input type="checkbox"/> Yes <input type="checkbox"/> No
D14) During pap test, are you satisfied with the communicative aspects with your gynecologist?	<input type="checkbox"/> Yes <input type="checkbox"/> No
D15) During pap test, did your gynecologist tell you about the possible diseases related to infection with human papilloma virus?	<input type="checkbox"/> Yes <input type="checkbox"/> No

TABLE 1 (CONTINUED)

HPV QUESTIONNAIRE ADMINISTERED TO 30 GIRLS		
QUESTIONS	ANSWERS	
SOCIO-DEMOGRAPHIC DATA		
D16) Age	
D17) Educational qualification	D17a Elementary school D17c Senior high school	D17b Junior high school D17e Degree
D18) Current occupation	D18a Student D18b Working (please specify type of employment) D18c Looking for work	
D19) Father's profession	
D20) Mother's profession	
D21) Nationality	
D22) Religion	
D23) Residence	

The questions about "Father's and Mother's profession", "Nationality", "Religion" and "Residence" were all open type.

TABLE 2

SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE		
SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE	N (%)	
TOTAL	30 (100)	
RESIDENCE	North	15 (50)
	South	15 (50)
NATIONALITY	Italian	30 (100)
	Foreign	0 (0)
RELIGION	Catholic	21 (70)
	Atheist	9 (30)
	Other	0 (0)
FATHER'S PROFESSION	Health care worker	5 (16.7)
	Public employee	14 (46.6)
	Self-employed	6 (20)
	Retired / Unemployed	5 (16.7)
MOTHER'S PROFESSION	Health care worker	6 (20)
	Public employed	11 (36.7)
	Self-employed	4 (13.3)
	Housewife / Unemployed	9 (30)

The questions about "Father's profession" and "Mother's profession" "Nationality", "Religion" and "Residence" were open type.

to 53.3% of over-18s.

According to young women, HPV can cause cervical cancer (93.3%), genital warts (16.7%), cancer of the oral cavity (10%) and anal cancer, esophageal cancer and recurrent cystitis (3.3%). Up to 6.7% didn't know what HPV causes.

The main sources of information about HPV vaccination for the respondents are represented by magazines / books (33.3%),

TV (26.7%), gynecologist (23.3%) and general practitioner (23.3%).

Attitudes

The HPV vaccine should be offered free or partially paid by the society for 83.3% and 13.3% respectively. Regarding sexual intercourse,

TABLE 3

ITEM-TOTAL STATISTICS - ITEM-TOTAL CORRELATION AND VARIABILITY OF CRONBRACH'S ALPHA, IF ONE ITEM WAS DELETED				
ITEMS	SCALE MEAN IF ITEM DELETED	SCALE VARIANCE IF ITEM DELETED	CORRECTED ITEM-TOTAL CORRELATION	CRONBACH'S ALPHA IF ITEM DELETED
D1A CERVICAL CANCER	42,50	38,571	,163	,041
D1B BLADDER CANCER	43,38	39,411	,000	,059
D1C GENITAL WARTS	43,25	39,929	-,144	,074
D1D IRRITABLE BOWEL	43,38	39,411	,000	,059
D1E ORAL CANCER	43,38	39,411	,000	,059
D1F ESOPHAGEAL CANCER	43,38	39,411	,000	,059
D1G RECURRENT CYSTITIS	43,38	39,411	,000	,059
D1H ANAL CANCER	43,38	39,411	,000	,059
D1I I DON'T KNOW	43,25	40,500	-,270	,088
D1L SOMETHING ELSE	43,38	39,411	,000	,059
D2A GENERAL PRACTITIONER	43,13	36,982	,393	,002
D2B GYNECOLOGIST	43,00	35,143	,652	-,050(a)
D2C FRIENDS	43,25	39,929	-,144	,074
D2D RADIO	43,38	39,411	,000	,059
D2E TV	43,00	40,000	-,131	,080
D2F WEB	43,38	39,411	,000	,059
D2G MAGAZINES	43,00	41,143	-,301	,106
D2H SOMETHING ELSE	43,38	39,411	,000	,059
D3A FREE PAYED BY THE SOCIETY	42,50	38,000	,295	,027
D3B PARTIALLY PAYED BY THE SOCIETY	43,25	41,071	-,394	,101
D3C AT PARTIAL LOAD OF THOSE WHO WANT TO VACCINATE	43,38	39,411	,000	,059
D3D I DON'T KNOW	43,38	39,411	,000	,059
D3E SOMETHING ELSE	43,38	39,411	,000	,059
D4A I DON'T MAKE MORE PAP SMEAR AFTER VACCINATION	43,38	39,411	,000	,059
D4B HOWEVER, I MAKE PAP SMEAR	42,38	39,411	,000	,059
D4C I DON'T KNOW	43,38	39,411	,000	,059
D4D SOMETHING ELSE	43,38	39,411	,000	,059
D5A BEFORE THE FIRST SEXUAL INTERCOURSE	42,63	38,554	,112	,043
D5B IF YOU THINK YOU MAY HAVE OCCASIONAL PARTNERS	43,25	40,500	-,270	,088
D5C IF YOU HAVE HAD MORE PARTNERS	43,38	39,411	,000	,059
D5D AFTER THE FIRST INTERCOURSE	43,25	40,500	-,270	,088
D5E ANYWAY	43,13	40,696	-,254	,094
D5F SOMETHING ELSE	43,38	39,411	,000	,059
D6A 11-13 YEARS	42,75	42,786	-,538	,141
D6B 14-17 YEARS	43,13	40,125	-,158	,081
D6C 18-21 YEARS	43,25	39,643	-,080	,068
D6D 22-26 YEARS	43,38	39,411	,000	,059
D6F SOMETHING ELSE	43,38	39,411	,000	,059

TABLE 3 (CONTINUED)

ITEM-TOTAL STATISTICS - ITEM-TOTAL CORRELATION AND VARIABILITY OF CRONBRACH'S ALPHA, IF ONE ITEM WAS DELETED				
ITEMS	SCALE MEAN IF ITEM DELETED	SCALE VARIANCE IF ITEM DELETED	CORRECTED ITEM-TOTAL CORRELATION	CRONBACH'S ALPHA IF ITEM DELETED
D6G ALL AGES	43,13	36,411	,499	-,014(a)
D7A MALE	43,38	39,411	,000	,059
D7B FEMALE	42,88	40,982	-,271	,103
D7C MALE AND FEMALE	42,88	38,411	,108	,042
D8A ONCE A WEEK	43,13	40,696	-,254	,094
D8B TWICE A WEEK	43,13	40,411	-,206	,088
D8C MORE THAN TWO TIMES PER WEEK	43,00	36,857	,364	-.017(a)
D8D ONCE / TWICE A MONTH	43,25	40,500	-,270	,088
D8E LESS THAN ONCE PER MONTH	43,38	39,411	,000	,059
D8F NEVER	43,38	39,411	,000	,059
D9A 1	43,00	42,000	-,426	,124
D9B 2	43,00	36,857	,364	-.017(a)
D9C 3 OR MORE	43,13	40,125	-,158	,081
D10A NONE	43,25	39,929	-,144	,074
D14 DURING PAP TEST, ARE YOU SATISFIED WITH THE COMMUNICATIVE ASPECTS WITH YOUR GYNECOLOGIST?	42,63	37,125	,367	,006
D15 DURING PAP TEST, DID YOUR GYNECOLOGIST TELL YOU ABOUT THE POSSIBLE DISEASES RELATED TO INFECTION WITH HUMAN PAPILLOMA VIRUS?	42,75	36,214	,470	-,018
D16 AGE	19,75	3,071	,348	-1,440(a)
D17 EDUCATIONAL QUALIFICATION	40,38	39,411	,000	,059
D18 CURRENT OCCUPATION	42,25	35,357	,934	-,047(a)

a The value is negative due to a negative average covariance among items.

*The number corresponds to the items shown in Table 1.

the vaccine should be given before the first sexual experience (73.3%), anytime (26.7%) and in case of multiple partners (3.3%). The 11-13 years old, the 14-17 years old and people of all ages should be vaccinated according to 53.3%, 26.7% and 23.3% of the sample, respectively.

Among those who carried out a Pap test, 72.7% affirm that they received satisfying information from their gynecologist; 100% of the sample declares that they will request a Pap-test after HPV vaccination.

Behaviour

All the respondents are sexually active. In particular, 39.1% have sexual intercourse twice a week, 26.1% once a week. Most of them declare only one partner (52.2%) and 8.7% report three or more partners. The responders use condoms (52.2%), the pill (34.8%) and coitus interruptus (13%) as a contraceptive method. The condom is always used by 57.1%, only occasionally by 28.6% and never by 14.32% of the young women.

Up to 41.4% of the sample has done a Pap-test and 45.5% of them declare that their gynaecologist informed them about the possible diseases caused by HPV.

DISCUSSION

Cancer is the leading cause of death worldwide and, specifically, cervical cancer is the second most common and the third most deadly gynaecological neoplasia worldwide. It is estimated that 80-90% of women will have this sexually transmitted infection at some point in their life, though only 3-4% of them will develop cervical cancer [18-23].

Considering that at present there is no cure for cancer, the best strategy to combat oncological diseases is through early detection and prevention. The methods currently available are vaccines to target specific viruses (primary prevention), in combination with screening (secondary prevention). Modifiable lifestyle-related risk factors are also important in cancer prevention. Vaccination has been proven to be highly effective against targeted diseases leading to the development of cancer, particularly if the vaccination is given in the early years of life. The need for regular screening should not be neglected and should be followed to detect unusual changes or abnormalities in the body.

It is becoming more and more important to raise awareness about cervical cancer. According to our study, HPV is recognized by young women mostly as the cause of cervical cancer (93.3%) and genital warts (16.7%). Recent studies have shown different degrees of knowledge about HPV-related diseases and few data are available regarding the awareness of cervical cancer among Italian women, especially among medium-high school and university students. Results of different studies suggest that knowledge about cervical cancer among these women is insufficient [34-36].

There is need for accurate data on current knowledge of women about cervical cancer in order to develop effective programs and increase public awareness, and to organize prevention campaigns aimed at encouraging cytological examination or HPV vaccination. It seems that awareness-raising campaigns have a considerable impact on women's knowledge about cytological examination as a screening tool.

This study underlines that vaccinated young women have general knowledge about secondary prevention of cervical cancer and it is interesting to note that they have sufficient knowledge about Pap-test as a screening tool: 76.7% of young women in the present study

recognized Pap-test as a screening tool for the prevention of cervical cancer.

As for the primary prevention of HPV, the majority of participants believed that only women should be vaccinated. This could be due to the fact that in Italy, the HPV vaccine is offered free to all 12 years old female adolescents, with a possible extension to other age groups based on regional criteria, but the cost of the HPV vaccine is often not covered by public funds in other age groups [37].

According to a study carried out by Censis Association, only a part of female population, those directly involved in the free vaccination program for adolescents, is properly informed; but, the decrement of vaccinated girls who have access to free vaccination shows that there is loss of attention to this issue [38]. Infact, the 1997 birth cohort was the first cohort invited to be active in most Italian regions in 2008. The purpose of the immunization program in Italy, defined by the Entente State-Regions, is to achieve 95% coverage with three doses of vaccine within 5 years after the vaccination program: girls born in 2001 will be invited for vaccination in 2012, and the vaccination coverage will be evaluated on 31 December 2013 [39].

As for many other countries, vaccination programs against HPV have been established for women and men that have not yet been included in programs funded at national level [40-41]. Nevertheless, in our study, 43.3% of the sample believes that only females should be vaccinated and, on the other hand, both genders should be vaccinated according to 53.3% of over-18s.

The survey conducted by Censis about HPV knowledge and attitude to vaccination, involved 3,500 women aged 18 to 55 years and showed a positive slope to prevention and vaccination against HPV, but the access to information is essential as well as the guide of a health care worker in the choice.

According to the PreGio project (that involved 2289 women aged 18-26 years), in order to minimize cervical cancer risk by improving women's adherence to preventive strategies, appropriate and adequate information dissemination, and guidance from health professionals appear to be crucial elements [42].

The results of the present study indicate that physicians play a marginal role considering that young vaccinated women prefer to inquire about HPV vaccination mainly through media such as

magazines and television, and the gynecologist is the third largest source of information; the last source are other health professionals, such as general practitioners, pediatricians and operators of Local Health Units (LHU).

Vaccine promoters may need to find more effective ways to encourage vaccination uptake in populations at high risk for contracting HPV [43]. That is the reason why even care providers must be involved; gynecologists and pediatricians should play their role as expert guides [38]. Clinicians and educators can play an important role in this regard, both in educational settings and in the community. In order to avoid misunderstandings, health care professionals in youth clinics and schools need to approach young women and clarify the relation between cervical cancer, HPV and sexual transmission [44]. More than ever, clinicians need regularly updated reviews, given the continuously increasing amount of new information regarding innovative cervical cancer prevention methods [45].

Although HPV vaccine has the potential to reduce the prevalence of cervical cancer, it is important to ensure that vaccination does not have detrimental effects on cervical screening and other health behaviours [46]. Fortunately, the belief that HPV vaccination may encourage sexual behaviour was not a prominent concern among the participants in this survey, which is consistent with the findings of other studies [47].

The results of a survey conducted in Italy by O.N.Da (Osservatorio nazionale sulla salute della donna - National Observatory on Women's Health) reported a 65% of immunization coverage, ranking after the United Kingdom (81%) and Portugal (80%): a good result in comparison to countries like France, Luxembourg and Norway, with a coverage between 17% and 30%. However, the goal of 95% of coverage is still far because of lack of information and miscommunication on the importance of primary and secondary prevention [48].

Considering that perceived benefits of HPV vaccination also contributed significantly to the intention to be vaccinated, the acquisition of more knowledge about vaccine safety and efficacy should be emphasized [49].

Some of the factors influencing acceptability of HPV vaccination that women identified in this study were also reported by other studies, such as the need for information about the vaccine in

relation to safety and side effects [50,51].

The impact of knowledge on behavior is complex and a variety of factors were seen to influence the young women's decisions, such as their mothers' influence, mass media campaigns, and family history of genital cancer. The strong impact of parental influence on young people has been recognized in other studies [52-56] and a reason against vaccination for parents concerns the risk that vaccine will increase dangerous sexual behaviours [57-59].

Factors influencing the decision to take the HPV vaccination should be further explored, but we recognized that the most likely cause for the low uptake of HPV vaccine is lack of financial resources: lowering the price of the vaccine (e.g. by reimbursement) might improve vaccination rates. Enforcing vaccination for children in universal programs and implementing school-based vaccine mandates, rather than trying to improve vaccination rates among adolescents, is an effective way of spreading the method of primary prevention.

In summary, the decision of HPV vaccination was based on the message that the vaccine gave protection against cancer and on the fact that young women had confidence in the vaccination. The fact that the majority of respondents was aware of cervical cancer and had sufficient knowledge about Pap-test as a screening tool gives cause for moderate optimism. Disappointment is due to the fact that the main sources of information about HPV vaccination are represented by magazines, books and TV rather than healthcare workers. Therefore, educational campaigns should focus on gaps of knowledge regarding HPV, cervical cancer and vaccination -as identified in the present study- promoting sources that are mainly used by young women.

CONCLUSIONS

It is important that health professionals provide comprehensible information about HPV vaccination while attaining informed consent. Our findings highlight the need to increase education regarding cervical cancer, HPV and counselling about HPV vaccination tailored to young women and their parents.

This pilot study demonstrates that the short version of the ad hoc questionnaire as a tool to examine knowledge, attitudes and behaviors

towards primary (anti-HPV vaccination) and secondary (pap-test screening) prevention of cervical cancer in young women in Italy has very good reliability properties and this needs to be taken into account in future studies.

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