

Available online at [www.sciencedirect.com](http://www.sciencedirect.com)

## Public Health

journal homepage: [www.elsevier.com/puhe](http://www.elsevier.com/puhe)

## Short Communication

# HPV vaccine hesitancy among parents of female adolescents: a pre–post interventional study



S. Palmeri, C. Costantino, C. D'Angelo, N. Casuccio, G. Ventura, F. Vitale,  
F. Pojero, A. Casuccio\*

University of Palermo, Palermo, Italy

## ARTICLE INFO

## Article history:

Received 2 December 2016

Received in revised form

19 February 2017

Accepted 17 May 2017

## Introduction

Human papillomavirus (HPV) is the most common sexually transmitted infection in female adolescents. The highest infection rate is found among individuals aged 15–24 years,<sup>1</sup> and the HPV vaccine represents an opportunity to reduce the burden of cervical cancer caused by HPV types 16 and 18.<sup>2</sup> The World Health Organization has defined girls aged 9–13 years as the priority target for HPV vaccination.<sup>3</sup> In Italy, in accordance with international public health guidelines, HPV vaccination was free and actively offered to all girls during their 12th year of life (from the completion of 11 years until the age of 12 years) between 2007 and 2008, establishing a target vaccination coverage of 95% within 5 years of the start of the campaign.<sup>4,5</sup>

However, despite several promotional activities, vaccination coverage is largely unsatisfactory, ranging from 25% to 82% between regions.<sup>6</sup>

The aims of this study were to determine HPV vaccination coverage within a cohort of girls born in 1999, to describe parents' attitudes towards HPV vaccination and their

knowledge and behaviours, to explore the possible reasons for parents' hesitancy towards HPV vaccination, and to examine the effect of an intervention providing parents with information to promote vaccine access.

## Methods

This study was conducted within the local health units (LHUs) of Palermo, Italy, including 1750 out of 1796 girls born in 1999. The exclusion criteria were: presence of contraindications ( $n = 10$ ), previous anaphylactic reaction ( $n = 8$ ), absence of contact information ( $n = 15$ ), and foreign origin of girls (six subjects excluded because of possible discrepancy with HPV vaccination policy in their country of origin).

HPV vaccination status was determined by consulting the official vaccination registry. All girls were considered to be fully vaccinated when they had received three doses of vaccine ( $n = 627$ ; 35.8%). Using a block randomisation method (1:1, block size of two) for two groups, the 1123 (64.2%) girls who had not been vaccinated at all or who had only received the first or second dose were divided at random into two groups:

- the intervention group ( $n = 561$ ) received a standardised telephone call from health personnel to administer a questionnaire to their parents;
- the control group ( $n = 562$ ) did not receive any intervention.

From January to June 2013, the parents of girls in the intervention group ( $n = 561$ ) were interviewed through a telephone semi-structured questionnaire, validated by

\* Corresponding author. Department of Sciences for Health Promotion and Mother Child Care, University of Palermo, Via del Vespro, 133, 90127 Palermo, Italy.

E-mail address: [alessandra.casuccio@unipa.it](mailto:alessandra.casuccio@unipa.it) (A. Casuccio).

<http://dx.doi.org/10.1016/j.puhe.2017.05.009>

0033-3506/© 2017 The Royal Society for Public Health. Published by Elsevier Ltd. All rights reserved.

previous epidemiological investigations (Centro Studi Investimenti Sociali, Social Investments Study Centre), and comprising multiple choice questions (seven on vaccinations and 13 on HPV infection). At least three attempts were made to contact the parents of these girls (at lunch time, afternoon and in the evenings). Interviewers explained the purpose of the study and obtained verbal consent from participants.

At the end of the interview, standardised counselling was provided to parents in order to explain the main route of virus transmission, the associated risk factors and the timing of vaccination, highlighting the fact that HPV vaccination was free of charge for the target age group. In addition, the parents were urged to vaccinate their daughters through a scheduled appointment.

One year after the interviews (June 2014), in the re-assessment of vaccination schedules of the study population, vaccination coverage pre-intervention and postintervention were evaluated and compared between the two groups.

## Results

Of the 561 families in the intervention group, 454 (80.9%) completed the questionnaires. One hundred and seven (19.1%) families were excluded because they refused to participate ( $n = 28$ ) or they were not available for interview ( $n = 79$ ).

As determined by the survey, 31.7% of the parents trusted vaccination, and 28% were hesitant regarding some vaccinations. More than one-third (40%) of parents agreed that mandatory vaccination was the best strategy to increase vaccination coverage.

Nearly two-thirds (62.3%) of parents declared that their main source of information regarding vaccination was a healthcare worker (HCW), particularly those working in the vaccine centre at the LHU. Mass media (particularly the Internet, television and newspapers) were the main source of information for 28.6% of parents, followed by family or friends (4.6%) and school (4.5%).

Among those who consulted HCWs, 55% reported that the information they received was adequate, while 44.5% ( $n = 202$ ) reported that the information was scarce and generic.

At least one HCW encouraged HPV vaccination for 44.1% of the interviewed parents. However, 32.1% of parents said that they had never talked about vaccination with any HCWs, and 12.1% declared that different HCWs expressed different opinions; only 3.3% of parents stated that the HCWs they consulted did not express any opinion on the subject. Finally, 8.4% of parents reported that the HCWs they consulted did not recommend HPV vaccination.

The use of condoms was reported as the best preventive measure for HPV infection by 63.2% of parents, while 21.6% believed that the risk of contagion may not be eliminated completely in sexually active individuals. Of the parents, 11.9% had no knowledge about the mode of transmission of HPV and 3.3% said that intimate hygiene was the only preventive measure.

The results regarding knowledge of HPV infection are summarised in [Table 1](#).

Regarding invitation for HPV vaccination by the vaccination centre, 233 (51.3%) girls were invited to receive HPV

**Table 1 – Knowledge about human papillomavirus (HPV) infection and route of transmission.**

Question	Correct answer n (%)	Incorrect answer n (%)
1. HPV infection is rare	252 (55.5)	202 (44.4)
2. HPV infection is sexually transmitted	316 (69.6)	138 (30.4)
3. HPV infection is transmitted through infected blood	236 (52.0)	218 (48.0)
4. HPV infection is transmitted through close contact with an infected person (hands, sneezes or kisses)	368 (81.1)	86 (18.9)
5. HPV infection is transmitted through common restrooms, and contaminated fomites (such as clothing and towels)	278 (61.2)	176 (38.8)
6. HPV infection is responsible for cervical cancer	424 (93.4)	30 (6.6)
7. HPV infection is responsible for genital warts	293 (64.5)	161 (35.5)
8. HPV can only infect women	237 (52.2)	217 (47.8)
9. Spontaneous regression of HPV infection is possible	133 (29.3)	321 (70.7)
10. HPV asymptomatic infection is possible	361 (79.5)	93 (20.5)
11. HPV infection could persist over time	353 (77.7)	101 (22.3)
12. Effectiveness of HPV vaccination is greater when administered before starting sexual activity	331 (72.9)	123 (27.1)
13. HPV vaccination protects against HPV serotypes responsible for the development of most cervical cancers	435 (95.8)	19 (4.2)

vaccination and 221 (48.7%) girls did not receive an invitation. The majority (91.2%) of girls did not receive a reminder from the Palermo LHUs.

One year after the questionnaire (June 2014), the official vaccination registry was consulted to re-examine HPV vaccination coverage of the 454 girls whose parents completed the questionnaire, and to compare this with HPV vaccination coverage of the 669 girls whose parents did not receive any form of intervention (the 562 girls in the control group and the 107 girls who did not take part in the survey).

In the non-intervention group, only 69 (10.3%) girls completed the vaccination schedule. In the intervention group, 123 (27.1%) girls completed the vaccination schedule after the questionnaire and counselling ( $P < 0.0001$ ). In particular, three subgroups of parents reported a significant change in their attitude towards HPV prevention, and ensured that their daughters completed the vaccination schedule:

- 59 out of 202 parents who considered HPV to be a rare disease (29.2%;  $P < 0.0005$ , McNemar test);
- 42 out of 138 parents who did not believe that sexual activity represents the principal route of transmission (30.4%;  $P < 0.0005$ , McNemar test); and

- 27 out of 86 parents who thought that HPV infection could be transmitted through close contact with an infected person (31.4%;  $P = 0.004$ , McNemar test).

## Discussion

Recognition of the main reasons for hesitancy regarding HPV vaccination is fundamental to develop tailored and innovative public health strategies.<sup>4,7,8</sup> Despite the fact that this survey was only undertaken in one region in Italy, it included all girls born in 1999 without stratification for social/economical and cultural background, thus testing the efficacy of the pro HPV vaccination campaigns and the postsurvey intervention beyond financial and educational barriers.

The main source of information was predominantly represented by HCWs; however, the parents had unconsolidated and partial knowledge about the route of transmission of infection. Moreover, 45% of the sample was dissatisfied, as they had received little or no information from HCWs regarding HPV vaccination; this could represent an important reason for hesitancy. Only 44% of the parents in this study reported that they had received positive advice from clinicians about vaccination. This result is confirmed by the 'Valore project',<sup>9</sup> which showed that HCWs only recommended vaccination in 31% of cases of unvaccinated girls.

The 'Valore project'<sup>9</sup> showed that Italian pre-adolescents are interested in HPV vaccination and in acquiring additional information, and identified school as a setting where they are free to express themselves without fear of being judged, especially if the dialogue takes place with trusted teachers. These results suggest the possible role of schools in the provision of information about HPV vaccination.

In this study, the re-examination of vaccination schedules and vaccine coverage 1 year after the interview demonstrated that parent counselling provided important information about HPV infection and prevention, and increased overall HPV vaccination coverage among unvaccinated or incompletely vaccinated girls.

In particular, the intervention group exhibited a significant change in attitudes towards HPV vaccination, and vaccination coverage almost tripled compared with the control group. These results are particularly significant if one considers that the provision of clear unambiguous information about HPV transmission was fundamental in influencing parental choice to ensure complete vaccination of their daughters. This has been confirmed in other national studies, which found that inadequate formation of families and inconsistent messages regarding HPV vaccination may contribute to refusal of HPV vaccination.<sup>9</sup>

Integrated curricular education or training for all HCWs involved in HPV vaccination is strongly recommended, particularly regarding the importance of providing correct and consistent information.

## Author statements

### Ethical approval

This study was approved by the Ethics Committee of the Azienda Ospedaliero-Universitaria Policlinico 'P. Giaccone', Palermo, Italy.

### Funding

None declared.

### Competing interests

None declared.

## REFERENCES

1. Bruni L, Diaz M, Castellsagué X, Ferrer E, Bosch FX, de Sanjosé S. Cervical human papillomavirus prevalence in 5 continents: meta-analysis of 1 million women with normal cytological findings. *J Infect Dis* 2010;202:1789–99.
2. Markowitz LE, Dunne EF, Saraiya M, Lawson HW, Chesson H, Unger ER, Centers for Disease Control and Prevention (CDC), Advisory Committee on Immunization Practices (ACIP). Quadrivalent human papillomavirus vaccine: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR Recomm Rep* 2007;56:1–24.
3. World Health Organization. Human papillomavirus vaccines. WHO position paper. *Wkly Epidemiol Rec* 2009;84:118–31.
4. Giambi C, D'Ancona F, Del Manso M, De Mei B, Giovannelli I, Cattaneo C, et al., Local Representatives for VALORE. Exploring reasons for non-vaccination against human papillomavirus in Italy. *BMC Infect Dis* 2014;14:545.
5. Ministerial Decree of Italian Republic. *Permanent conference for the relations between the state, regions and autonomous provinces of Trento and Bolzano*, 22 February 2012. Rome: Official Gazette of Italian Republic; 12 March 2012. Available at: [http://www.apel-pediatri.org/attachments/471\\_Piano%20Nazionale%20Prevenzione%20Vaccinale-1.pdf](http://www.apel-pediatri.org/attachments/471_Piano%20Nazionale%20Prevenzione%20Vaccinale-1.pdf) (last accessed 17 May 2017).
6. Giambi C. *State of the art of the vaccination campaign for the HPV vaccine coverage data 31/12/2012 – Annual report*. Rome: Istituto Superiore di Sanità (Health Care Institute); 2013. Available at: [http://www.epicentro.iss.it/problemi/hpv/pdf/Aggiornamento\\_HPV\\_31122012.pdf](http://www.epicentro.iss.it/problemi/hpv/pdf/Aggiornamento_HPV_31122012.pdf) (last accessed 17 May 2017).
7. Rambout L, Tashkandi M, Hopkins L, Tricco AC. Self-reported barriers and facilitators to preventive human papillomavirus vaccination among adolescent girls and young women: a systematic review. *Prev Med* 2014;58:22–32.
8. Beavis AL, Levinson KL. Preventing cervical cancer in the United States: barriers and resolutions for HPV vaccination. *Front Oncol* 2016;6:19.
9. Giambi C, Del Manso M, De Mei B, D'Ancona F, Giovannelli I, Cattaneo C, et al., VALORE working group. VALORE Project: local and regional assessment of vaccination campaigns against HPV: promote conscious adherence to vaccination. *Rapporti ISTISAN* 13/47. Rome: National Center for Epidemiology Surveillance and Health Promotion (CNESPS); 2013. Available at: [http://www.iss.it/binary/publ/cont/13\\_47\\_web.pdf](http://www.iss.it/binary/publ/cont/13_47_web.pdf) (last accessed 17 May 2017).