

Article

# Key Factors Influencing Italian Mothers' Intention to Vaccinate Sons against HPV: The Influence of Trust in Health Authorities, Anticipated Regret and Past Behaviour

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**Abstract:** The Human Papillomavirus (HPV), which is the most common sexually transmitted infection in the world, is associated with different types of cancer, especially cervical cancer. In Italy in 2017 the Italian Ministry of Health introduced a free HPV vaccination programme for 12-years-old boys. In this study we tested an integrated theory of planned behaviour (TPB) model to explain Italian mothers' intention to vaccinate their sons against HPV. TPB variables plus past behaviour, trust in healthy authorities and anticipated regret were measured by a questionnaire in a sample of 333 Italian mothers of 6–11 years old boys, who were not yet vaccinated against HPV. Results showed that subjective norm was the strongest predictor of mothers' intention followed by anticipated regret, trust in health authorities, perceived behavioural control and attitude. Mediation analysis found that past behaviour influenced intention via attitude. The discussion considers the relevance of these factors in promoting mothers' adherence.

**Keywords:** HPV; intention to vaccine; mother; adolescence; adherence

## 1. Introduction

The Human papillomavirus (HPV) is the most common sexually transmitted infection (STI) in the world and is associated with different types of cancer in females, especially cervical cancer. The most consistent predictors of HPV infection are sexual activity, age of first sexual intercourse and number of sexual partners [1]. HPV can also lead to significant health complications in males, including genital warts and anal, penile and oropharyngeal cancers. However, the males' vaccination is still less widespread in 11 European countries [2].

In determining adherence to the HPV vaccination, an important role is played by parents' decisions to have adolescent daughters and sons vaccinated. Interestingly, a systematic review on 19 international studies (excluding Italy) [3] summarized the role of a list of factors, such as parents' knowledge on prophylaxis, parents' concerns with safety and/or side effects, parents' trust in health provider and/or government and/or school, positive parental attitudes and parent-child communication. In the specific case of the daughters' vaccination, the parental decisions were based on different aspects, such as knowledge about HPV, attitudes of healthcare providers, attitudes of parents, potential unintended consequences of HPV vaccination [4]. In the case of the less widespread sons' vaccination, for example Perez et al. [5] found that in Canada the lack of free programmes for boys and the lack of information

explained why most parents were unengaged or undecided [5]. Moreover, another study [6] showed that parents, who were concerned about the exposure of their sons to HPV and perceived it as a risky infection, were more likely to accept HPV vaccination for their sons.

### 1.1. The Italian Adherence to the HPV Vaccination

In Italy, a HPV vaccination programme was introduced in 2008 for females and in 2017 for males [7], when the Italian Ministry of Health decided to offer free vaccination to the target population of 12-year-old adolescents. Now, the HPV vaccination is free during their twelfth year of life. It is not mandatory but is strongly recommended by paediatricians. Compared to other European nations, the Italian percentage for HPV vaccination in females is fairly good (72.73% vaccinated with at least one dose and 66.42% completed the entire cycle). Nevertheless, it is still below the optimal threshold set by the Italian Vaccine Prevention Plan 2017–2019 (95%). Also in the Italian context, the parent's attitude, intention and acceptance of HPV immunization are the determining factors of the females' adherence to the HPV vaccinations [8–10].

In the case of male 12-year-old adolescents, the Italian average coverage is lower (19.04% vaccinated with at least one dose and 14.58% completed the entire cycle). This average is still well below the expected threshold (60% for 2017, 95% in 2019). However, no previous research has previously investigated the role of parental psychosocial factors in relation to Italian 12-years-old males adherence to the HPV vaccination. Starting from the lack of literature in the Italian context, the present research attempted to clarify the psychosocial factors involved in Italian mothers' intention to initiate HPV vaccination for their male children. A focus on the mothers' intention is justified based on the past research showing that in many countries the mother is the primary parent who makes health decisions about their children [11], including choices regarding vaccination [12]. To achieve this aim, in the present study, we applied the theory of planned behaviour (TPB) as the theoretical framework.

### 1.2. The Theory of Planned Behaviour Approach

The TPB model states that attitude, subjective norm and perceived behavioural control (PBC) influence behavioural intention, which in turn predicts the related behaviour. Attitude towards a behaviour refers to the individual's overall evaluation of the behaviour. Subjective norm is described as the individual's perception of the social expectations towards a behaviour. PBC is the individual's perception of the ease or difficulty of the particular behaviour or perceived confidence that they can perform it [13]. The TPB has been effectively applied to explain a variety of health behaviours [14–16], including parental prevention behaviours such as vaccinating their children [1,13,17]. For example, a recent TPB study concerning influenza vaccination [18] showed multiple potential influences on parental decisions to choose to vaccinate their sons. This study showed that both physical, contextual, sociodemographic aspects and psychological determinants (risk perception, past behaviour, knowledge and experience) were important factors influencing the parental decisions towards sons' vaccinations.

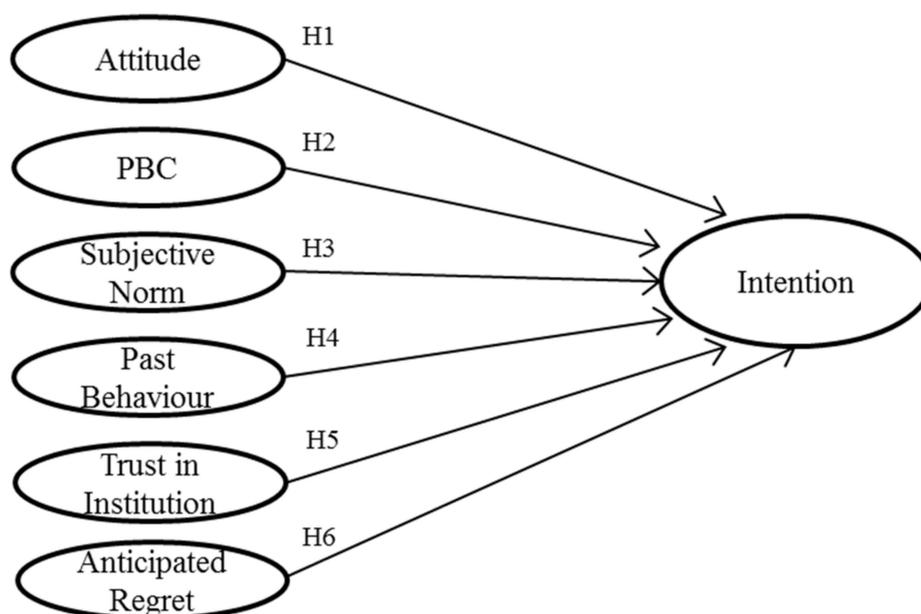
In the case of HPV, research has shown that the TPB model was equally useful to understand people's intentions to receive HPV vaccination and parental intentions towards vaccinating their children. For example, Juraskova et al. [19] showed that TPB model predicted 54% of the variance in female Australian university students intention to receive the vaccine. Moreover, applying the TPB model, some scholars showed the important role of positive attitude and subjective norm to explain young American males' intention to receive HPV vaccination [1,20]. Following the above results, Catalano et al. [1] designed an intervention for American college students eligible for the vaccine. This study found that attitude towards the behaviour and subjective norm were significant predictors of behavioural intention, accounting for 58% of its variance. Importantly, previous studies have also shown that TPB factors help understand parental decisions towards vaccinating children. For example, Hofman [21] found that Dutch parents, who had positive attitude, high subjective norms and PBC in relation to HPV vaccination, had also high intention to vaccinate their children.

In the present study, in order to examine the Italian mothers' intention to initiate HPV vaccination in their male children, we particularly focused on TPB variables and the additional role of past behaviour about the adherence to other recommended vaccinations, anticipated regret about the failure to vaccinate and trust in health authorities. We analysed the role of past behaviour because we expected that previous experiences might have an impact on parental decisions about other vaccinations. Past behaviour, in fact, significantly improves the prediction of later behaviour and the addition of past behaviour to the TPB variables improves the predictive power of the model [22]. In fact, previous studies found that mothers whose children had received all their vaccinations in the past were more likely to be interested in vaccinating their child against HPV [23–25].

We also analysed the role of anticipated regret in predicting Italian mothers' intentions to vaccinate their sons. Anticipated (inaction) regret refers to the anticipated negative feeling when an individual thinks about the possibility of not performing a behaviour [26]. For example, Christy et al. [17] found that anticipated regret predicted HPV vaccination intentions among young men and this result suggests that such anticipatory emotions may play a decisive role in healthcare decision-making.

As regards to the role of trust in predicting adherence to health-protective behaviours, previous research found that trust in health authorities predicted people' adherence to recommended behaviours [27]. For example, Prati, Pietrantonio and Zani [28] indicated that in the case of the pandemic influenza H1N1 in 2009, trust in health authorities played a decisive role in predicting participants' intentions to adhere to the recommended protective behaviour (i.e., to clean or disinfect objects that one touches more often than usual). Specifically, a lack of trust in health authorities was the most frequently reported barrier to HPV vaccination [29]. Moreover, trust in the Healthcare institution about the HPV vaccination (e.g., regarding its safety and efficacy) was shown to increase intention and vaccine uptake [29].

In summary, the present study aimed to test the predictors of Italian mothers' intentions to initiate HPV vaccination in their male children focusing on the relationships between the variables considered. In the present study, we proposed an extended TPB model, which is shown in Figure 1.



**Figure 1.** Hypothesised theory of planned behaviour (TPB) model to predict Italian mothers' intention to vaccinate their sons.

## 2. Method

### 2.1. Participants and Procedures

Data were collected in 2018. Study participation was limited to Italian mothers. In Italy, since 2017 all boys receive an invitation to get vaccinated with the HPV vaccine (free of cost) in the year they turn 12 years of age and usually mothers decide whether to have them vaccinated or not. After obtaining the approval of the Ethics Committee of Psychological Research of Department of Humanities University of Naples 'Federico II' an online questionnaire was posted on three well-known Facebook groups used by Italian mothers to share information, advice and opinions about childhood and their maternal care. These groups were 'Mamme di figli maschi' (1484 members), 'Le mamme della porta accanto' (10262 members), 'Mamme di Castellammare di Stabia & dintorni' (4259 members). Although in these groups there is not a specific topic of interest, most discussion is related to how to cope with maternal responsibilities and tasks.

The questionnaire was active online for two months and its compilation required about twenty minutes. Researchers did not provide incentives for participation. Our survey was started by 356 users and was fully completed by 333 participants. Thus, it was completed by 2.1% of users registered on the three selected Facebook groups.

The first section of the questionnaire offered a brief description of HPV vaccination. This description allowed participants who had no prior knowledge of the vaccine for males to be able to answer the following items on the study variables. In addition, at the beginning of the questionnaire we asked participants to create a personal code to prevent the presence of duplicates in our study.

### 2.2. Measures

The online questionnaire included 34 items to measure TPB variables (intention, attitude, subjective norm and PBC) plus anticipated regret, trust and past behaviour, mothers' age, plus children's gender and age. All items were measured on a 5-point Likert scale, except for the attitude scale. Table 1 shows study measures with their Cronbach's alpha and standardized factor loadings.

Mothers' *intentions* to initiate HPV vaccination in their male children were assessed with three items adapted from Askelson [17]: (e.g., 'I intend to vaccinate my son against HPV' ranged from (1) 'strongly disagree' to 'strongly agree' (5) [8].

Mothers' *attitudes* towards the HPV vaccinations were measured using 5-point scale items based on bipolar adjectives (e.g., 'Vaccinating my son against HPV is ... ' not important-important, harmful-beneficial, disadvantageous-advantageous, unpleasant-pleasant, useless-useful, dangerous reliable, bad-good, worthless-worthwhile, unhealthy-healthy, irresponsible-responsible) adapted from Bryer [25].

Mothers' *subjective norms* (SN) were measured with nine items adapted from Askelson [17] (e.g., 'My family/other mothers/doctors think that I should vaccinate my son against HPV' ranged from (1) 'strongly disagree' to (5) 'strongly agree').

*PBC* was assessed with four items adapted from Askelson [17] (e.g., 'If I wanted to vaccinate my son against HPV, it would be easy' ranged from (1) 'strongly disagree' to (5) 'strongly agree').

*Anticipated regret* (AR) about not vaccinating sons was measured by three items adapted from Conner et al. [30] (e.g., 'If I did not vaccinate my son against HPV, I would regret it' ranged from (1) 'strongly disagree' to (5) 'strongly agree').

*Trust in health authorities* was measured using three items adapted from Prati et al. [28] (e.g., 'The HPV vaccination program is safe because it is approved by the Health Ministry' ranged from (1) 'strongly disagree' to (5) 'strongly agree').

*Past behaviour about previous vaccination* (PB) was measured using two items related to vaccination behaviour asking mothers if they complied with compulsory vaccinations for their children (e.g., 'Did you make your children get mandatory vaccinations?'). Inter-item correlation was 41.

**Table 1.** Study measures.

Study Measurements	Standardized Factor Loading	Cronbach's Alpha
<b>Intentions to vaccinate</b>		0.98
I intend to vaccinate my son against HPV. strongly disagree (1)–strongly agree (5)	0.98	
I plan to vaccinate my son against HPV. strongly disagree (1)–strongly agree (5)	0.93	
I want to vaccinate my son against HPV. strongly disagree (1)–strongly agree (5)	0.99	
<b>Attitudes toward the HPV vaccinations</b>		0.98
Vaccinating my son against HPV is not important (1)–important (5)	0.91	
Vaccinating my son against HPV is harmful (1)–beneficial (5)	0.89	
Vaccinating my son against HPV is disadvantageous (1)–advantageous (5)	0.77	
Vaccinating my son against HPV is unpleasant (1)–pleasant (5)	0.95	
Vaccinating my son against HPV is useless (1)–useful (5)	0.88	
Vaccinating my son against HPV is dangerous (1)–reliable (5)	0.95	
Vaccinating my son against HPV is bad (1)–good(5)	0.93	
Vaccinating my son against HPV is worthless (1)–worthwhile (5)	0.96	
Vaccinating my son against HPV is unhealthy (1)–healthy (5)	0.95	
Vaccinating my son against HPV is irresponsible (1)–responsible (5)	0.94	
<b>Subjective Norms</b>		0.93
My family think that I should vaccinate my son against HPV. strongly disagree (1)–strongly agree (5)	0.82	
My family expect me to vaccinate my son against HPV. strongly disagree (1)–strongly agree (5)	0.82	
My family want me to vaccinate my son against HPV. strongly disagree (1)–strongly agree (5)	0.85	
Other mothers think that I should vaccinate my son against HPV. strongly disagree (1)–strongly agree (5)	0.88	
Other mothers expect me to vaccinate my son against HPV. strongly disagree (1)–strongly agree (5)	0.88	
Other mothers want me to vaccinate my son against HPV. strongly disagree (1)–strongly agree (5)	0.86	
Doctors think that I should vaccinate my son against HPV. strongly disagree (1)–strongly agree (5)	0.83	
Doctors expect me to vaccinate my son against HPV. strongly disagree (1)–strongly agree (5)	0.53	
Doctors want me to vaccinate my son against HPV. strongly disagree (1)–strongly agree (5)	0.85	

Table 1. Cont.

Study Measurements	Standardized Factor Loading	Cronbach's Alpha
<b>Perceived Behavioural Control</b>		0.88
For me the vaccination of my child against HPV is possible. strongly disagree (1)–strongly agree (5)	0.93	
If I wanted to vaccinate my son against HPV, it would be easy. strongly disagree (1)–strongly agree (5)	0.66	
It depends entirely on me if my child will not be vaccinated against HPV. strongly disagree (1)–strongly agree (5)	0.73	
I feel control on vaccinating of my child against HPV. strongly disagree (1)–strongly agree (5)	0.72	
<b>Anticipated regret</b>		0.96
If I did not vaccinate my son against HPV, I would regret it. strongly disagree (1)–strongly agree (5)	0.89	
If I didn't vaccinate my child against HPV, I would worry. strongly disagree (1)–strongly agree (5)	0.93	
If I didn't vaccinate my son against HPV, I would feel guilty strongly disagree (1)–strongly agree (5)	0.93	
<b>Trust in health authorities</b>		0.96
The HPV vaccination program is safe because it is approved by the Health Ministry. strongly disagree (1)–strongly agree (5)	0.94	
If the government offers HPV vaccination I assume it is safe. strongly disagree (1)–strongly agree (5)	0.96	
Our Government shows responsibility for public health by introducing vaccination against HPV. strongly disagree (1)–strongly agree (5)	0.94	
<b>Past behaviour about previous vaccination</b>		
Did you make your children get mandatory vaccinations? yes (1)–no (0)	0.46	
Did you make your children booster shots of the mandatory vaccinations? yes (1)–no (0)	0.89	

### 2.3. Data Analysis

The data were analysed using MPLUS statistical software. Descriptive statistics were used to describe the participants' characteristics. To find a satisfactory TPB model, the present study compared the TPB model (Model 1) with extended models (adding PB, AR and trust sequentially in models 2, 3 and 4 respectively). As the models are nested we used a chi-squared difference test ( $\Delta \chi^2$ ) to compare models (a significant reduction in the  $\chi^2$  difference-value indicates a better fitting model or significant additional predictor). There were no missing values.

### 3. Results

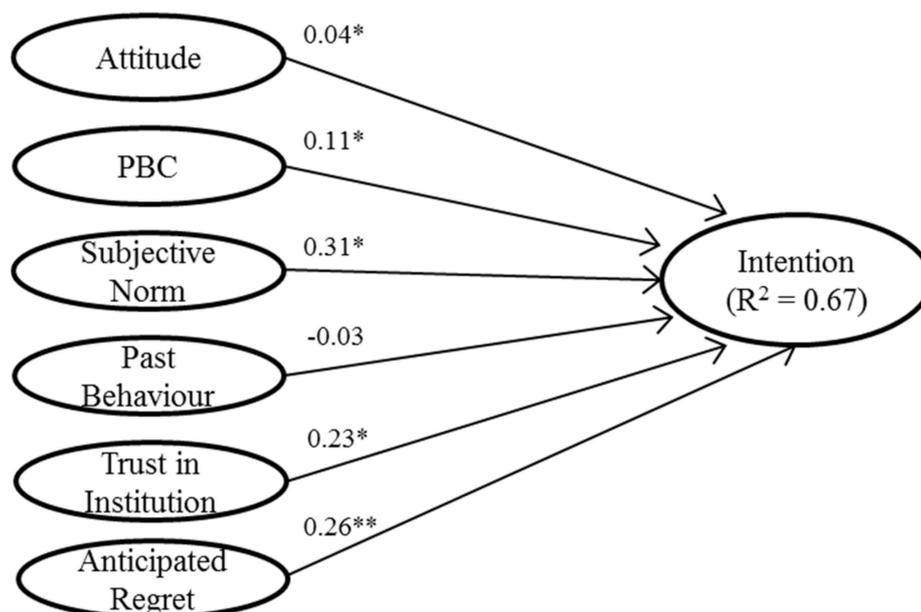
Our sample was composed of 333 Italian mothers ( $M = 37.12$ ;  $SD = 6.25$ ; age range = 23–55) of 6–11 years old boys who have not yet received a HPV vaccination. Most mothers were married (74%), catholic non-practicing (43.1%) and apolitical (48.2%). As for the place of origin, most mothers were from Southern Italy (55.1%) and only 6.9% did not have Italian origins. Table 2 reports the correlations among the study variables, and their means and SD.

**Table 2.** Correlation, mean and standard deviation for each study variable.

Variables	1	2	3	4	5	6	7	M	SD
Intention	1							3.49	1.29
Attitude	0.62	1						4.01	1.12
Subjective Norms	0.72	0.54	1					3.15	1.02
PBC	0.70	0.54	0.76	1				3.49	1.08
Anticipated regret	0.74	0.67	0.69	0.71	1			3.41	1.14
Trust	0.73	0.63	0.70	0.73	0.76	1		3.29	1.19
Past Behaviour	-0.23	-0.30	-0.18	-0.20	-0.21	-0.21	1	1.85	0.33

To test the construct validity of the extended model, the measurement model included seven latent factors indicating intention, attitude, PBC, SN, PB, trust and AR. Goodness-of-fit statistics for the measurement model were acceptable. The chi-square was significant ( $\chi^2 = 958.89$ ,  $df = 329$ ,  $p < 0.001$ ), but all the other indices pointed to a good model fit (RMSEA = 0.06; CFI = 0.95; TLI = 0.94; SRMR = 0.04) with significant parameter estimates. If the sample size is moderate, as is our case, a significant chi-square can be expected even with a good fitting model. All estimated parameters presented appropriate values (Table 1). Given the measurement model was a good fit, no model modifications were implemented [31] and hypothesized paths (structural model) among variables were analysed.

Model 2 ( $\Delta \chi^2 (2) = 17.49$ ;  $p < 0.001$ ), model 3 ( $\Delta \chi^2 (3) = 78.4$ ;  $p < 0.001$ ) and model 4 ( $\Delta \chi^2 (5) = 387.8$ ;  $p < 0.001$ ) each showed significant changes in incremental fit. The final model, Model 4 (Figure 2) was an excellent fit to the data ( $\chi^2 (2) = 17.48$ ,  $p = 0.02$ ; RMSEA = 0.00; CFI = 0.99; TLI = 0.89; SRMR = 0.07). In this model, the majority of predictors had a significant relationship ( $p < 0.001$ ) with intention ( $R^2 = 0.67$ ): SN was the strongest predictor ( $\beta = 0.31$ ), followed by anticipated regret ( $\beta = 0.26$ ), trust ( $\beta = 0.23$ ), PBC ( $\beta = 0.11$ ) and attitude ( $\beta = 0.04$ ). PB had no a direct impact on intention ( $\beta = -0.03$ ;  $p = 0.38$ ) but did have a significant indirect effect via attitude (indirect =  $-0.04$ ,  $p < 0.05$ ). In sum, all hypothesised paths among TPB variables, plus trust and anticipated regret, and mothers' intention were confirmed by the SEM analysis.



**Figure 2.** Extended TPB Model (Model 4). Path model with standardized regression coefficients. Note. PBC = perceived behavioural control; \*  $p < 0.5$ , \*\* =  $p < 0.001$ . Covariances and error variables not shown for ease of interpretation.

#### 4. Discussion

In the present study, we provide a potential contribution to the current literature on parental psychosocial factors related to mother's intention to initiate HPV vaccination in their male children. In Italy, there is still a lower adherence to the male HPV vaccination. Thus, it could be worthwhile identifying which mothers' cognitions and emotions (attitude, subjective norm, PBC, past behaviour, trust in institution and anticipated regret) about this vaccine are predictive of intentions and so might be usefully targeted to promote intention to vaccinate. Thus, given that there is no study related to the predictiveness of these factors in Italian context, we aimed at filling this gap in the literature by applying the TPB model plus extensions.

Descriptive statistics show that Italian mothers had high scores on intention, attitude, subjective norm, PBC, anticipated regret and trust. In contrast, they had low scores on past behaviour. Consistent with the literature [32] all TPB variables were positively correlated with mothers' intention towards vaccinating their sons. Anticipated regret and trust were positively correlated with mothers' intention, whereas past behaviour and intention were negatively correlated.

As hypothesized, attitude towards HPV vaccine (H1), subjective norms (H2), PBC (H3), anticipated regret (H4) and trust (H5) predicted mothers' intention. While past behaviour did not thus H6 was disconfirmed. These results are in line with other studies in the literature that used TPB to verify the predictors of the intention to vaccinate children against HPV [1,17,19–33]. In particular, the final model showed that subjective norms were the strongest predictor, followed by anticipated regret, trust, PBC and attitude, with past behaviour only influencing intentions via attitudes. This would suggest that an intervention might target any of these variables to change Italian mother's intentions to vaccinate their sons for HPV but that subjective norms, anticipated regret and trust might be particularly useful targets. In our findings, past behaviour about sons' vaccinations negatively correlated with all other predictors of Italian mothers' intentions to vaccinate their sons against HPV, differently to other studies in which past behaviour had a positive effect [34]. This negative relationship between past experiences and other factors could be explained by referring to the self-completion theory [29]. This theory states that past behaviour would negatively predict future behaviour when congruent past actions contribute to developing a sense of self-completeness. A sense of completeness may, in turn, reduce other efforts to repeat the behaviour in future. In our case, past compulsory vaccination may provide the Italian mothers with the perception of fulfilment of their parental role about disease prevention for their children, reducing the likelihood that they feel the need to protect children from future health risks. Another possible explanation could be related to the fact that parents whose child had experienced an adverse effect were more concerned about the safety of vaccines, less likely to think that vaccines were valuable, and less likely to want a new child to have all their immunizations. The children were also more likely to be missing one or more doses of three immunizations [25,35]. Probably, this was also the case of some of the Italian mothers in our sample, but before accepting this interpretation it will be necessary to consider the effects of previous vaccinations in the children of mothers who do not intend to subject their children to further vaccinations, as in the present case of HPV vaccination.

The indirect effect for past vaccination behaviour confirmed that past vaccination behaviour should not limit efforts to get Italian mothers to intend to vaccinate their sons for HPV. As argued by Eagly and Chaiken [36], past behaviour is indirectly related to the intentions through its effects on other predictors, in particular attitudes. Indeed, past behaviour might be used to infer attitude toward the behaviour, which in turn influences intention.

Interestingly, our findings confirmed that trust in health authorities was a predictor of the intention to vaccinate sons for HPV. This is consistent with other studies showing that efforts to encourage HPV vaccination would fall short, if people trust in health authorities is not also taken into account [28,29].

Therefore, this study provides new information on which factors might usefully be targeted to promote Italian mothers' adherence to the vaccination programmes (i.e., subjective norms, anticipated regret and trust). Although further research would need to test the causal impact of changing such variables on intentions and actual behaviour. Indeed, the present research offers a potential new

contribution for documenting how Italian mothers are thinking, learning and deciding on HPV vaccination. Our data is in line with literature that indicates high levels of intention to vaccinate for the prevention of cancer associated with HPV. But, recently, because of the low vaccine coverage, the concept of ‘vaccine hesitancy’ has spread to indicate the so-called ‘hesitant’ individuals; hesitant parents were generally found to have an intermediate position between pro and anti-vaccine [37]. The literature suggests that vaccine hesitancy is a complex and multifaceted phenomenon, whose determinants are located at the individual, social and community level [38]. Therefore, future research should identify not only psychological barriers but also social and community barriers that hinder or could hinder the administration of vaccines. It has indeed been demonstrated that participatory community-based research interventions can be particularly useful to increase HPV immunization rates [39–41].

The present study has a number of weaknesses including a focus on intentions rather than behaviour. A further weakness is the lack of representativeness of the sample of mothers (i.e., Italian mothers who use Facebook to share information about childcare). It is unclear the extent to which the current findings would be generalisable to other mothers in Italy or beyond. Moreover, in future studies researchers could also assess the role of other variables such as the health locus of control and paranormal health beliefs [42,43], as well as considering mother’s attitude, engagement and intention in relation to traditional and alternative medicine. These factors might also predict the mother’s intention to vaccinate their sons against HPV and interact with the other predictors identified in the present study. Additionally, one more factor that could impact on adolescent HPV vaccination is represented by providing detailed information to the mothers. Thus, future studies could investigate the effectiveness of this factor on Italian mothers with experimental procedures.

Finally, future experimental studies could investigate if the provision of detailed information on the HPV vaccinations could increase mother’s intention to initiate HPV vaccination. Moreover, given that online interventions [44,45] are promising instruments for increasing health behaviours, future researches could implement a new program for promoting the adherence to HPV vaccine using also these types of persuasive communication.

## 5. Conclusions

This study is in line with the third sustainable development objective of ‘The 2030 Agenda for Sustainable Development’ proposed by the United Nations Member States [46]. This action programme for people, planet and prosperity, includes 17 Objectives (Sustainable Development Goals, SDGs) to reach by 2030. In particular, Goal 3 concerns the promotion of health and well-being and emphasises that to achieve sustainable development it is essential to guarantee a healthy life and promote the well-being in all age groups. Consistent with this goal, the psychological research on vaccination behaviour and in particular on the factors that influence the intention to adhere to vaccines, appears essential to obtain useful information for the development of health promotion interventions aimed both at the community in general and at population groups most at risk, like 12-year-old male adolescents.

To date, in Italy there are few studies on sons’ HPV vaccination despite a vaccination programme that has been active since 2017. The present research helps fill this gap.

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