



RESEARCH PAPER

Psychosocial Factors of Cervical Cancer Vaccine Hesitancy in Parents

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ABSTRACT

This study examines how do Psychosocial factors (Health belief, Illness Perception and Religious Attitude) tend to influence the level of cervical cancer vaccine hesitancy in parents. Despite the global implementation of HPV vaccine, uptake remains sub-optimal in Pakistan amid its recent national rollout, where parent's skepticism driven by the misinformation, lack of trust and fear of infertility has hindered campaign success. A (Quantitative) Correlational research design was used. The parents (fathers=55, mothers=91) were recruited from community settings using snowball sampling Strategy. The standardized instruments was used such as the Brief Illness Perception Questionnaire, Health Belief Model Scale for Cervical Cancer and Pap Smear, Religious Attitude Scale and WHO SAGE Vaccine Hesitancy Scale, in addition to a demographic questionnaire. The results showed that parents who had a higher level of perceived seriousness of cervical cancer exhibited less vaccine hesitancy, specifically in terms of lack of confidence. Conversely, greater illness perceptions were linked with greater worries about vaccine-related harms, hinting at the multidimensional and complex nature of vaccine hesitancy. The relationship of psychosocial factors and vaccine hesitancy, however, was not significantly moderated by religious attitude. Culturally sensitive awareness programs, improved health communication and targeted community-based strategies may enhance vaccine acceptance and contribute to the preventions of cervical cancer in Pakistan.

Keywords: Health Beliefs Model Scale, Vaccine Hesitancy, Religious Attitude, Illness Perception

Introduction

With an estimated 2022 incidence of 660,000 cases, cervical cancer ranks as the fourth most frequent cancer among women. The region of sub-Saharan Africa can be seen to have the highest incidence of this type of cancer, as well as the highest mortality. The 2022 global mortality of 350,000 cases of cervical cancer leads to a prevalence of 94% for women from developing countries. The inequality in the distribution of cervical cancer cases is a direct result of unequal social, political, and economic factors in addition to the inequity in the availability and distribution of the cancer vaccine, screening, and treatment services. The high prevalence of HIV in many countries of sub-Saharan countries is one of the main contributors to unequal distribution of cervical cancer cases and sex and gender inequity. Women with HIV have a 6 times higher incidence of cervical cancer than women in the general population. In addition, 5% of cervical cancer cases are due to HIV (Stelze et al. 2020). Additionally, cervical cancer is a major cause of cancer-related deaths among women of reproductive ages and is responsible for 20% of maternal orphanhood (Guida et al. 2020).

Cancers of the cervix are associated with the abnormal proliferative epithelial lining of the cervix (Cancer Council Australia, 2023). Human papillomavirus (HPV), a sexually transmitted infection, can affect skin, the genital region, and be involved in the oral cavity as well. It is a ubiquitous virus and will infect almost all sexually active people. In the majority of the instances, HPV is asymptomatic and is cleared from the body by the immune

system. A cervical cancer precursor lesion is thought to be a persistent high-risk HPV. Cancer of the cervix is a consequence of this (WHO, 2025).

Cervical cancer begins in the cervix. This is at the lower end of the uterus in the birth canal. It connects the uterus to the vagina. Cervical cancer usually develops gradually. Before cervical cancer develops, dysplasia is underwent. This is when cervical cells change and show abnormal cells in the cervix. If abnormal cells are neither destroyed nor removed, they can become cancerous and spread to other organs. (Cohen, et al. 2019)

The World Health Organization (WHO) defines vaccine hesitancy as "the ambivalence about or delay in accepting available vaccines" (Morales-Campos, Zimet, and Kahn, 2023). Pakistan has reported a low uptake of the HPV vaccine in the recent national rollout, despite the global introduction of the HPV vaccine. This is largely due to misinformation, mistrust, and concerns for infertility, causing significant negative impacts on the success of HPV programs in Pakistan (Pakistan Today, 2025). The captured vaccine hesitancy demonstrates the psychosocial factors linked to this emerging phenomenon of vaccine hesitancy.

Fear of infertility, mistrust of vaccine safety, religious beliefs, cultural misconceptions, and lack of perceived susceptibility are all psychosocial factors that greatly affect parents' willingness to vaccinate their daughters (Guvenc et al., 2021; Larson et al., 2022).

Empirical evidence also indicates that people's perceived effectiveness, or "response efficacy" of the HPV vaccine has a strong influence on their decision; individuals who perceive the vaccine as more likely to prevent disease are more likely to intend to receive it (Olagoke, Caskey, Floyd, Hebert-Beirne, & Molina, 2021).

Illness perceptions the cognitive and emotional representations that individuals have about cervical cancer play a crucial role in vaccine hesitancy. For instance, a cross-sectional study by Chen, Wang, Huang, and Zhang (2024) among female university students in China found that low risk perception of cervical cancer (i.e., a belief that one is unlikely to develop the disease) was significantly associated with HPV vaccine hesitancy; trust and perceived risk mediated the effect of knowledge on hesitancy.

Religious beliefs and orientation strongly influence HPV vaccine attitudes, particularly in conservative or highly religious societies. A scoping review conducted in Islamic countries found that religious concerns were among the top barriers to HPV vaccine acceptance and directly contributed to lower uptake. Religious teachings can therefore shape perceptions of risk, necessity, and safety, leading to greater vaccine hesitancy (Kisa & Kisa, 2024).

Literature Review

Bilge et al., (2025) performed a descriptive and correlational study to examine the associations between HPV vaccine hesitation and women's attitudes toward early detection of cervical cancer in reproductive-aged women. Their findings identified that sociodemographic factors like education, income and living environment had significant statistical associations with HPV vaccine attitudes and were strong determinants of vaccine hesitancy. There were also significant effects from behavioral factors, such as smoking status. The study noted that women have been turning to friends and the Internet as their trusted resources for information, but there was a lack of knowledge regarding practical skills.

Huang et al., (2022) performed a massive cross-sectional investigation to explore the determinants of HPV vaccine hesitancy and the extent of HPV vaccine hesitancy among

female university students in China using the WHO 3Cs Model. They found that while the majority of students said there was no hesitation, the uptake of HPV vaccination was actually 34.2%, meaning there was a disparity between intention and action. The study showed that several psychosocial factors significantly influenced hesitancy such as: lower belief in vaccination efficacy, lower risk of HPV infection, and concerns around cost and accessibility (e.g., distance and time spent on vaccination).

Ji et al. (2025) highlight that cervical cancer remains a major global public health concern and is the fourth most common cancer among women worldwide. In China, the burden is particularly significant, accounting for nearly 18% of global cervical cancer cases. HPV infection is the primary cause of cervical cancer, and vaccination is a highly effective preventive measure against high-risk HPV types and related cancers.

Diaconescu et al. (2021) examined psychological variables associated with HPV vaccination intent among female medical students in Romanian academic settings. The study aimed to assess HPV-related knowledge and explore how coping strategies, health locus of control, and sense of coherence influence vaccination intentions. Conducted among 1,243 participants, the findings indicated that although students demonstrated generally good and progressively improving knowledge about HPV, vaccination intent was primarily shaped by psychological factors rather than knowledge alone. Specifically, active coping strategies and a “powerful others” health locus of control were positively associated with vaccination intent, while behavioral disengagement and reliance on religious coping were linked to vaccine refusal.

Yusuf, K.K., Ouedraogo, S., Olorunsaiye, C. Z, Abdullahi, A. A., and Gadanya, M. A, and Salihu, H. M. Parental hesitancy was cited as one of the major challenges for the introduction of the HPV vaccine in Nigeria's routine immunization schedule (RIS) (2024). This was a cross sectional study in Kano State with 1071 parents/caregivers of adolescents (aged 9-14 years) who were selected through a multi-stage sampling technique. Str questionnaires were used to gather data using the Socio-ecological Model and the Precaution Adoption Process Model. The results showed that awareness was very low, with only 4.2 % aware of HPV and 5.1 % of the participants aware of HPV vaccine. Even when people could get their children vaccinated free of charge or discounted, 32.7% of parents stated they would not vaccinate their children.

Cooper et al. (2025) conducted a comprehensive qualitative evidence synthesis to explore the factors influencing caregivers' and adolescents' views and practices regarding HPV vaccination globally. Drawing on 206 studies (with 71 included in the final synthesis), the review identified that HPV vaccination decisions are shaped by a complex interplay of individual, social, and structural factors. Key themes included limited biomedical knowledge, perceptions of vaccine risks and benefits, past experiences with vaccination programs, and family decision-making dynamics.

Hypotheses

H₁ Psychosocial factors likely to be associated with cervical cancer vaccine hesitancy in parents.

H₂ Parents with diverse sociodemographic are likely to differ in their level of cervical cancer vaccine hesitancy.

H₃ Religious attitude is likely to moderate the relationship between psychosocial factors and vaccine hesitancy.

Material and Methods

A Correlational (cross-sectional) research design was used to investigate the extent to which Psychosocial factors (Health beliefs, Illness perception, religious attitude) tend to influence the level of cervical cancer vaccine hesitancy in parents.

Sample and sampling Strategy

A snowball sampling Strategy was used to recruit participants for this study. Initially, eligible parents were approached through social networks and invited to participate in the research.

Inclusion criteria

- Parents or primary guardians of a girl eligible for HPV vaccination.
- Parents with basic formal level education and literacy skills.
- Resident of the area for a minimum duration 6 six months or more.
- Parents or guardians who identify as Muslim.

Exclusion criteria

- Parents of the girls who have already completed the full HPV vaccine course.
- Parents/guardians with a career/profession related to healthcare or involved in immunization delivery (professional role bias).
- Parents with any child having a medical contradiction to HPV vaccine (because decision here is clinical not hesitancy).
- Parents with a family history (first or second-degree relatives) of gynecologic cancers such as cervical, uterine, ovarian, or vulvar cancer.
- Those reporting an experience of adverse reaction of any vaccination.

Assessment Measures

Demographic Information Sheet

Demographic questionnaires created by the researcher will be used to survey the demographics of the parents. Demographic information will include relationship to child, gender, age, year of formal education, marital status, employment status, household income, family background (rural/urban), family system (joint/nuclear) of the parents, Number of Children and others.

General Health Indicators Sheet

Researchers created a general health indicator sheet to determine participants' general health information. General health indicators will include immunization history, chronic illness history, history of other vaccinations, etc.

Brief Illness perception questionnaire (Brief-IPQ) (Broadbent, Wilkes, Koschwanez, Weinman, Norton & Petrie, 2006)

The Brief Illness Perception Questionnaire (Brief-IPQ) was created by Broadbent, Petrie, Main, and Weinman (2006), and is a brief, psychometrically robust tool, used to assess a person's cognitive and emotional representation of illness. The scale is comprised of 9 items, of which, 8 are rated on a 0-10 Likert scale and 1 is an open-ended question that asks about the perceived causes of illness. The Brief-IPQ is widely used, has good internal consistency and has a Cronbach's Alpha ranging from 0.70 to 0.80.

Health belief Model for cervical Cancer and pap smear test (Guvenc, Akyuz &Acikel, 2011)

This scale was created by Guvenc et al. (2011) and consists of a 5-point Likert-type scale. This scale is made up of 35 items divided into five subscales. The five subscales are: Benefits of Pap Smear Test and Health Motivation, Barriers to Pap Smear Test, Perceived Seriousness of Cervical Cancer, Susceptibility to Cervical Cancer, and Health Motivation. The higher the score, the more intense the feelings. The relation of the constructs to the screening behavior scale is positive except for barriers, which are negatively related. Each subscale has a Cronbach's (alpha) value. The 5 subscales of the Benefits of Pap Smear Test and Health Motivation and Health Motivation ($\alpha = 0.86$), Barriers to Pap Smear Test ($\alpha = 0.82$), Perceived Seriousness of Cervical Cancer ($\alpha = 0.78$), Susceptibility to Cervical Cancer ($\alpha = 0.78$), and Health Motivation ($\alpha = 0.62$) are given.

Religious attitude Scale (Oney, 2000)

This scale was created by Oney in 2000 and translated to Urdu by Ayub (2019). The scale was comprised of 18 items, rated on a 4-point Likert scale where 1 signified 'never' and 4 signified 'always.' For the RAS, Onay (2000) stated the alpha coefficient of reliability as .94.

Vaccine Hesitancy Scale (World Health Organization's Strategic Advisory Group of Experts (WHO SAGE), 2015)

In 2015, the Strategic Advisory Group of Experts (SAGE) at the World Health Organization (WHO) created the Vaccine Hesitancy Scale (VHS). Perceived risk and lack of confidence are the two factors on the scale. The scale uses a 5-item Likert scale, where 1 indicates "strongly disagree" and 5 indicates "strongly agree." To indicate greater hesitancy, seven of the items were reverse-coded. The scale has two subscales: lack of confidence and risk. The overall scale's alpha reliability coefficient is 0.80.

Procedure

Prior to starting the data collection process, all necessary permissions were obtained from the appropriate authorities. A snowball referral sampling technique was used to recruit study participants. The first step was to contact a small pool of eligible parents. Participants were then asked to identify and contact parents in their social and family networks who would also qualify to be study participants. Using this method, referral and further data recruitment was systematically and gradually completed. The sample was drawn and data were collected, using both online and paper-based methods. A total of 115 participants were recruited in-person using social and personal data contacts. An online Google Form was created to enable a wider data collection and the link to the form was shared on various social networking sites and social media groups (including some WhatsApp online communities). Using this method, 48 data participants were recruited. Data were screened and the rest were filtered for completeness. In total, 101 participants (from data collected in-person) and 45 participants (from data collected online) were finalized for this study.

Ethical Considerations

Ethical Guidelines by the American Psychological Association (APA) was followed for conducting the current research.

Statistical Analysis

The mean, standard deviation, and percentage for each characteristics of the sample will be presented. Reliability will be assessed using Cronbach's alpha, and predictive validity will be assessed using Pearson's Product-Moment correlation and multiple regression. Differences between groups in the sample related to the socio-demographic variables will be determined using independent samples t-test and ANOVA. Multiple regression will be used to identify the strongest predictor(s) of the outcome of interest. Finally, moderation analysis will be assessed using the PROCESS macro for SPSS.

Results and Discussion

This chapter provides results from a detailed statistical study investigating how much psychosocial factors (Health beliefs, Illness perception, and religious attitude) are likely to be connected to parental cervical cancer vaccine hesitancy.

Reliability Estimates and Descriptive Analysis of Measures

Reliability and descriptive statistics were measured for the Health Beliefs scale for Cervical Cancer and Pap smear, Brief Illness Perception scale, Religious Attitude Scale and Vaccine Hesitancy Scale. Results are presented the following table.

Table 1
Cronbach Alpha and Descriptive Statistics for study variables (N = 146)

Measures	K	a	M	SD	Range		Skewness
					Actual	Potential	
BIPQ	8	.76	50.62	13.72	27-57	8-80	-.321
HBMSFCCAPS							
PSOCC	07	.75	24.24	4.51	7-35	7-35	-.451
STCC	03	.73	8.16	2.56	3-15	5-15	-.153
HM	03	.83	10.02	2.76	3-15	5-15	-.145
RAS	18	.72	53.87	7.50	18-72	4-72	-1.07
VHS							
LOC	7	.79	16.41	5.11	7-29	5-35	.084
PR	3	.51	11.02	2.12	5-15	5-15	-.063

Note. BIPQ= Brief Illness Perception Questionnaire, HBMSFCCAPS= Health Belief Model Scale for Cervical Cancer and Pap smear, PSOCC= Perceived Seriousness of Cervical Cancer, STCC= Susceptibility to Cervical Cancer, HM= Health Motivation, RAS= Religious Attitude Scale, VHS= Vaccine Hesitancy Scale, LOS= Lack of Confidence and PR= Perceived Risk.

Table 1 shows the descriptive statistics of the study variables (mean, standard deviation, range, skewness, & kurtosis). The reliability coefficient for scales ranges from 0 to 1.0. High reliability values for scales indicate high internal consistency of the scale. The Brief Illness Perception Questionnaire (BIPQ) showed an acceptable reliability ($\alpha = .76$). The scales of the Health Belief Model for cervical cancer and Pap smear showed the perceived seriousness of cervical cancer ($\alpha = .75$), cervical cancer susceptibility ($\alpha = .73$), and health motivation ($\alpha = .83$). The reliability of the Religious Attitude Scale was ($\alpha = .72$). Two subscales of the Vaccine Hesitancy Scale showed the confidence subscale ($\alpha = .79$) to be high, while the perceived risk subscale ($\alpha = .51$) to be low. The alpha for the scales are within the acceptable range. The skewness of the used scales is within the acceptable range of + 2 to - 2.

Table 2
Correlation between demographic variables and BIPQ, RAS, LOS, PR, PSOCC, STC and HM.

	1	2	3	4	5	6	7	8	9	10	11
Age	-										
DOM	.699***	-									
AOS	.652***	.580***	-								

MFI	-.032	-.014	-0.10	-						
RAS	.078	.036	-.073	-.162	-					
BIPQ	-.085	-.055	-.044	-.034	.037	-				
LOC	.234**	-.007	.234**	-.053	-.073	-.107	-			
PR	-.142	.077	-.114	.144	-.094	.179*	-.629***	-		
PSOCC	-.239**	-.108	-.160	-.178*	-.156	.202*	-.474***	.393***	-	
STCC	.013	-.192*	.032	-.175*	.091	.114	.181*	-.110	.073	-
HM	-.040	.042	-.024	-.178*	.010	-.168*	-.059	-.125	-.005	-.177*

Note. AGE=age, AOS= Age of spouse, DOM= duration of marriage, MFI=Monthly Family Income, BIPQ=Brief Illness Perception Questionnaire, PSOCC=Perceived Seriousness of Cervical Cancer, STCC= Susceptibility to Cervical Cancer, HM= Health Motivation, RAS= Religious Attitude Scale, LOS= Lack of Confidence and PR= Perceived Risk. $p < .5$. ** $p < .01$.

The correlation analysis revealed significant relationships among vaccine hesitancy, illness perception, and Health Belief Model constructs related to cervical cancer. Lack of confidence in vaccination showed a significant negative association with perceived risk ($r = -.629$, $p < .01$) and perceived seriousness of cervical cancer ($r = -.474$, $p < .01$), suggesting that participants with lower confidence in vaccines were less likely to perceive cervical cancer as risky and serious. People with lower levels of confidence perceived themselves as more vulnerable to cervical cancer ($r = .181$, $p < .05$). This means that people with greater vaccine hesitancy believed that they were more likely to develop cervical cancer.

Perceived risk had a positive correlation with illness perception and the perceived symptoms of cervical cancer ($r = .393$, $p < .01$). These results depict that the parents that perceived more of a risk associated more seriousness and threat to cervical cancer. There was also a positive correlation between illness perception and the perceived symptoms of cervical cancer ($r = .202$, $p < .05$). This suggests that the more people disliked the illness, the more serious they perceived the illness to be.

The Brief Illness Perception was negatively correlated with health motivation ($r = -.168$, $p < .05$) and perceived seriousness of cervical cancer ($r = -.177$, $p < .05$). This suggests that participants perceived cervical cancer as serious and subsequently the participants had very little motivation to engage in health-promoting behaviors. Wang et al. (2021) stated that the higher the perceived seriousness of an illness, and the higher the perceived susceptibility of an illness, the lower the hesitancy to receive a vaccine, and the higher the acceptance of vaccination. Furthermore, a systematic review conducted by Shmueli (2021) stated that if an individual perceives an infectious illness as serious and also feels that it relates to them personally, that individual will be more inclined to accept vaccination.

Furthermore, Religious Attitude did not show any statistically significant relationship with vaccine hesitancy, illness perception, or Health Belief Model variables.

Table 2 showed significant relationships between socio-demographic variables and study variables. Age also showed a significant positive relationship with lack of confidence ($r = .234$, $p < .01$), suggesting that older participants had greater vaccine hesitancy in terms of lower confidence toward vaccination. However, age demonstrated a significant negative relationship with perceived seriousness of cervical cancer ($r = -.239$, $p < .01$), indicating that as age increased, participants perceived cervical cancer as less serious.

Duration of marriage showed a significant negative relationship with susceptibility to cervical cancer ($r = -.192$, $p < .05$), suggesting that women with older spouses perceived themselves as less susceptible to cervical cancer.

Monthly Family Income (MFI) demonstrated a notable inverse correlation with Perceived Seriousness of Cervical Cancer (PSOCC), Susceptibility to Cervical Cancer (STCC), and Health Motivation (HM). This means that as parents' family income increased, they were more likely to view cervical cancer as a lesser threat, thought they were at a lower risk of

contracting the disease, and showed a reduced level of motivation for engaging in health-promoting and preventive behaviors.

From the different dimensions, these analyses show that perceptions of cervical cancer are affected by the socio-demographic factors, vaccine hesitancy, illness perception, and health-related beliefs.

Table 3
Analysis of Multiple Linear Regression for the Prediction of Vaccine

Variables	Vaccine Hesitancy (Lack of Confidence)			(Risk)		
	B	S.E	B	B	S.E	B
Constant	28.785	4.438		7.859	1.923	
RAS	-.014	.050	-.021	-.006	.022	-.021
BIPQ	-.029	.056	-.038	.031	.024	-.099
PSOCC	-.550	.085	-.486***	.179	.037	.382***
STCC	.433	.147	.217**	-.141	.064	-.171*
HM	-.054	.137	-.029	-.105	.060	-.137
Model Summary						
R ²	.274			.206		
F	10.551***			7.253***		

Note. BIPQ= Brief Illness Perception Questionnaire, PSOCC= Perceived Seriousness of Cervical Cancer, STCC= Susceptibility to Cervical Cancer, HM= Health Motivation, RAS= Religious Attitude Scale, LOS= Lack of Confidence and PR= Perceived Risk. $p < .5$. ** $p < .01$.

The multiple linear regression analysis indicated that religious attitude, illness perception, perceived seriousness of cervical cancer, susceptibility to cervical cancer, and health motivation together significantly predicted vaccine hesitancy and explained 27.4% of its variance ($R^2 = .274$, $F = 10.551$, $p < .001$). Among these variables, perceived seriousness of cervical cancer emerged as a significant negative predictor ($\beta = -.486$, $p < .001$), indicating that women who perceived cervical cancer as more serious were less likely to show vaccine hesitancy. In contrast, susceptibility to cervical cancer was a significant positive predictor ($\beta = .217$, $p < .01$), suggesting that women who perceived themselves as more vulnerable to cervical cancer showed higher vaccine hesitancy. However, religious attitude, illness perception, and health motivation were non-significant predictors, indicating that these variables did not meaningfully contribute to predicting vaccine hesitancy in the present study. The regression analysis indicated that perceived risk-related vaccine hesitancy can be predicted by a combination of factors, including religious attitude, illness perception, perceived seriousness of cervical cancer, susceptibility to cervical cancer, and health motivation. Together, these factors explain 20.6% of variance in perceived risk-related vaccine hesitancy ($R^2 = .206$, $F = 7.253$, $p < .001$). Among the predictors, perceived seriousness of cervical cancer was the only negative significant predictor ($\beta = -.382$, $p < .001$). This suggests that the more serious women viewed cervical cancer, the less likely they were to be hesitant about the vaccine. This finding was similar to the factor of susceptibility to cervical cancer, which was also a negative significant predictor ($\beta = -.171$, $p < .05$).

Across both regression models, perceived seriousness of cervical cancer consistently emerged as the strongest and most significant predictor, indicating that greater awareness about the seriousness of cervical cancer reduces vaccine hesitancy.

Table 4
Comparison of family background among study variables

Measures	Urban		Rural		T(144)	P	95% CI		Cohen's d
	M	SD	M	SD			LL	UL	
RAS	54.93	7.681	51.98	6.850	2.303	.023	.418	5.472	0.40
BIPQ	44.89	6.718	42.02	6.685	2.480	.014	.584	5.165	0.43

PSOCC	24.41	4.849	23.94	3.862	.604	.547	-1.07	2.018	0.10
STCC	8.17	2.718	8.15	2.296	.037	.971	-.864	.897	0.01
HM	10.05	2.868	9.96	2.589	.191	.849	-.855	1.039	0.03
VH(LOC)	16.56	5.211	16.13	4.982	.509	.629	-1.32	2.182	0.09
VH(R)	11.02	2.110	11.04	2.160	.813	.963	-.744	.710	0.14

Note. BIPQ= Brief Illness Perception Questionnaire, PSOCC= Perceived Seriousness of Cervical Cancer, STCC= Susceptibility to Cervical Cancer, HM= Health Motivation, RAS= Religious Attitude Scale, LOS= Lack of Confidence and PR= Perceived Risk. $p < .5$. ** $p < .01$.

Table 4 indicates that family background is significantly associated with religious attitude (RAS) and illness perception (BIPQ). The independent samples t-test results show that respondents from urban areas score significantly higher on both variables compared to those from rural areas ($p < 0.05$). This suggests that parents from urban settings have a more pronounced religious attitude as well as a stronger perception and awareness of illness. Overall, the findings indicate that family background specifically influences how individuals perceive health-related issues and develop religious coping perspectives, while no meaningful differences are observed in other study variables. The findings revealed that urban parents were significantly more likely to perceive HPV infection and cervical cancer as serious health threats compared to rural parents, with adjusted odds ratios indicating higher perceived seriousness among urban respondents (Degarege et al., 2018).

Table 5
Comparison of Child's history of chronic illness among study variables

Measures	Yes		No		T(144)	P	95% CI		Cohen's d
	M	SD	M	SD			LL	UL	
RAS	51.13	6.621	54.04	7.545	-1.067	.288	-8.304	2.482	-0.39
BIPQ	45.50	5.425	43.78	6.901	.694	.489	-3.189	6.639	0.25
PSOCC	22.00	1.512	24.38	4.598	-3.58	.002	-3.779	-.974	-1.30
STCC	8.25	2.659	8.16	2.572	.097	.923	-1.761	1.943	0.04
HM	9.75	2.053	10.04	2.804	-.284	.777	-2.279	1.706	-0.10
VH(LOC)	13.38	.916	16.59	5.206	-5.85	.000	-4.315	-2.10	-2.13
VH(R)	11.0	1.069	11.03	2.168	-.069	.946	-.958	.900	-0.03

Note. BIPQ= Brief Illness Perception Questionnaire, PSOCC= Perceived Seriousness of Cervical Cancer, STCC= Susceptibility to Cervical Cancer, HM= Health Motivation, RAS= Religious Attitude Scale, LOS= Lack of Confidence and PR= Perceived Risk. $p < .5$. ** $p < .01$.

Table 5 indicates that child history of chronic illness is significantly associated with perceived seriousness of cervical cancer (PSOCC) and vaccine hesitancy (LOC). The independent samples t-test (unequal variances assumed) shows significant differences for both variables ($p < 0.05$), with higher mean scores among parents whose children do not have a history of chronic illness. This suggests that these parents tend to perceive cervical cancer as more serious and also report greater vaccine hesitancy compared to those whose children have chronic illness. In general, the results show that the health status of children influences parents' perceptions of how severe the health issues of the children are and how confident they are about their children's vaccination.

Table 6
Comparison of Parent's history of Chronic Illness among study variables (N=146)

Measures	Yes		No		T(144)	P	95% CI		Cohen's d
	M	SD	M	SD			LL	UL	
RAS	53.00	6.33	54.03	7.70	-.593	.554	-4.472	2.408	-0.14
BIPQ	46.45	4.67	43.41	7.05	2.57	.014	.656	5.431	0.45
PSOCC	24.00	5.13	24.29	4.41	-.277	.782	-2.361	1.781	-0.06
STCC	7.55	2.80	8.27	2.51	-1.22	.221	-1.901	.443	-0.28
HM	9.27	2.91	10.15	2.72	-1.38	.169	-2.140	.379	-0.32
VH(LOC)	15.86	4.68	16.51	5.20	-5.43	.588	-2.990	1.701	-0.13
VH(R)	10.64	2.19	11.10	2.10	-.938	.350	-1.430	.510	-0.22

Note. BIPQ= Brief Illness Perception Questionnaire, PSOC= Perceived Seriousness of Cervical Cancer, STCC= Susceptibility to Cervical Cancer, HM= Health Motivation, RAS= Religious Attitude Scale, LOS= Lack of Confidence, and PR= Perceived Risk. $p < .5$. $**p < .01$.

Table 6 shows that illness perception (BIPQ) is the only significant illness-related variable for parents with a history of chronic illness, as all other variables are not significant. Based on the independent samples t-test, unequal variance shows significant difference ($p = .014$) where parents with a history of chronic illness show high BIPQ scores. This finding concludes that such parents are more attuned to and more cognizant of health-related concerns, indicating stronger perceptions of illness and their vulnerability. Generally, other results show that chronic illness experiences affect parents' perceptions of the health risks and how they interpret them. However, these experiences capture less influence on their religious attitude, health-related beliefs and consequently, their vaccine hesitancy. This may actually be supported by research showing the opposite: parents that have chronic conditions and are not involved with the healthcare and preventative services will likely depend on the healthcare system less, will avoid treatment, and therefore will be more vaccine hesitant (Faktor et al. 2025).

Conclusion

This study analyzes parents' attitudes toward cervical cancer vaccines and sheds light on the impact psychosocial factors have over demographics. The research found that health and illness perceptions influence hesitancy, with more people perceiving cervical cancer as serious showing less hesitance, though this might cause more concern over the risks associated with the vaccine. This illustrates the complexity of the decision-making process and is consistent with the Health Belief Model, which suggests that the perceived threat and perceived barriers are likely to act together when making decisions about health. The moderating role of religious attitude was not statistically significant, showing that vaccine hesitancy is not likely to be affected by religiosity, which is traditionally considered, but depends more on the context of the situation. Also, the absence of statistically significant differences in attitudes by gender suggests and confirms that the factors affecting vaccine hesitancy are primarily cognitive, cultural, and based on personal experience, rather than simple demographic factors.

Recommendation

Actions aimed at reducing hesitance for the HPV vaccine should provide important information about the safety and effectiveness of the vaccine as well as the dangers and the likelihood of developing an HPV infection. It is important to recognize and understand that hesitance toward the HPV vaccine comes from more than just the lack of knowledge, and this study highlights the impact of perceptions, cultural attitudes, and trust toward this vaccine. There is also a strong impact of culture and religion on the acceptance of vaccines in the Pakistani context, which is the primary focus of this study. Because of that, it is highly likely that the acceptance of the HPV vaccine can increase if the community leaders, including religious leaders and scholars, actively work to provide an alternative framing that presents the HPV vaccine as a cancer prevention vaccine rather than a vaccine for a sexually transmitted infection.

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