



ORIGINAL ARTICLE



Knowledge and attitude regarding human papillomavirus vaccine and its associated factors among parents of daughters age between 9-14 years in central Ethiopia, 2021

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Abstract

Background. Human Papillomavirus (HPV) is the most common sexually transmitted disease and the major cause of cervical cancer, which threatened the lives of several women and remains a critical concern in Africa and around the world. Ethiopia initiates the human papillomavirus vaccines on 3rd December 2018 for the primary time to vaccinate six million girls.

Objective. This study assessed knowledge and attitudes toward the human papillomavirus vaccine among parents of daughters aged between 9 and 14 years in the Central Ethiopia

Methods. A community-based cross-sectional study was conducted on 619 parents whose daughters were aged between 9 and 14 years old from February 01 to February 30, 2021. A multistage sampling method was employed to select study participants. Data were collected using an interview administered questionnaire adapted from related literature. Descriptive, bivariate, and multivariate binary logistic regression analyses were done by using SPSS v. 20.0.

Results. A total of 619 parents participated in the current study of whom, only 242 (39.1%) and 249 (40.2%) of the respondents were knowledgeable and had a favorable attitude toward the HPV, respectively. Age (AOR 1.98, 95% CI: 1.07, 3.69), place of residence (AOR 3.6, 95% CI: 1.45, 8.92), and wealth status (AOR 1.89, 95% CI: 1.09, 3.26) was independently associated with the knowledge of parents toward the HPV.

Conclusion. Policymakers and other stockholders require more effort to provide a resource to enhance knowledge and attitudes toward the HPV through the mass media and other health education outlets.

Keywords: Knowledge, HPV Vaccine, Attitude, Cervical cancer, Central Ethiopia.

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INTRODUCTION

HPV is the most widespread sexually transmitted infection and the leading cause of cervical cancer. Only a handful of the more than 200 serotypes of human papillomavirus are known to have carcinogenic potential (1). Human Papillomavirus types HPV16 (3.2%), HPV18 (1.4%), HPV52 (0.9%), HPV31 (0.8%), and HPV58 (0.7%) are the most prevalent (2). Cancers of the vagina, vulvar, penile, sero-pharynx, and anus may result from HPV infection. In addition, HPV serotypes 6 and 11 are responsible for sero-genital warts and active respiratory papillomatosis (3). Human Papillomavirus does not manifest symptoms until it has caused cervical cancer (4).

The global prevalence of HPV infection is around 11–12%. In Latin America, the incidence rate is 16%, in Eastern Europe it is 21%, and in Sub-Saharan Africa it is 24%. In Eastern Africa and the Caribbean, where incidence rates reach 30%, the disease is notably prevalent. Prevalence of human papillomavirus is relatively high in women under the age of 25 but significantly reduced in women over 45. (2). Annually, 569,847 cases and 311,365 deaths are attributed to cervical cancer globally. Human Papillomavirus types 16 and 18 are the most prevalent viruses that cause invasive cervical cancer, which accounts for approximately 70% of all cervical malignancies. Globally, 85 percent of cervical cancer cases are diagnosed in underdeveloped nations (1). Cervical cancer is the second greatest cause of cancer-related death among young women in Sub-Saharan Africa, with an estimated 500,000 new cases and approximately 300,000 deaths annually.

Morbidity and mortality associated with cervical cancer include high rates of HPV infection, high rates of sexually transmitted infections including HIV, a lack of awareness of primary and secondary prevention services, a high rate of sexual violence, poverty and a lack of awareness about HPV infection, cervical cancer, and the HPV vaccine, limited access to health services, and a deficiency in cervical cancer screening tests. Ultimately, a greater knowledge of the variables that influence parents' decisions to vaccinate their daughters is required (5, 6).

Cervical screening and Pap screenings are performed

every three years as a preventative measure against cervical cancer. For pre-cancer, visual examination with acetic acid (VIA) and therapy with nitrous oxide are also employed. Pap smears and VIA are used to determine if the virus has created abnormal changes in the cervix that are indicative of cervical cancer (4). Vaccines against Human Papillomavirus can prevent diseases caused by certain HPV serotypes. Quadrivalent and nonavalent vaccinations protect against HPV serotypes 16 and 18, which are associated with the highest risk of cervical cancer, as well as HPV types 6 and 11, which offer stronger protection against anal and vaginal cancer, and maybe some oral cancer. It is believed that HPV vaccinations can prevent 70% of cervical cancer, 80% of anal cancer, 60% of vaginal cancer, 40% of vulvar cancer, and possibly a small amount of mouth cancer. Human Papillomavirus (HPV) vaccines are recommended by the World Health Organization (WHO) as part of regular immunizations for people aged 9 to 14 years prior to becoming sexually active in all countries (1,7).

More than 57 nations had embraced HPV into their national health programs by 2014. Cervarix (bivalent) and Gardasil (quadrivalent) vaccinations are used to prevent HPV infections. Three vaccination doses are delivered. The initial dosage is administered during initial contact with daughters. The second dosage is administered two months after the first, while the third dose is administered four months after the second. To be totally protected, one must receive all three doses and optimize the efficacy of the vaccination administered to daughters prior to sexual activity (8). Implementation of a primary preventive vaccination is anticipated to have a substantial influence on the incidence of cervical cancer, especially in areas where testing is nonexistent, limited in scope, or of poor quality (9). HPV are available commercially to prevent Human Papillomavirus, the leading cause of cervical cancer (9, 10).

Nonetheless, a number of variables have become the primary obstacles to HPV vaccination usage and acceptance. In the majority of less developed and middle-income nations, where weak socioeconomic conditions have a direct impact on the population, the likelihood of not obtaining the HPV vaccine was high. This was primarily due to a lack of knowl-

edge (11). A comprehensive evaluation from a Sub-Saharan nation indicated that the degree of HPV vaccine awareness among parents was as low as 20%, which influenced the choice not to accept HPV vaccination the most (12). The most frequent reason for such refusal was a desire to learn more about the vaccination (13), whereas the most common cause for rejection was a lack of understanding about HPV vaccine (52.3%). (14). On the other hand, the HPV vaccination's acceptance is primarily determined by their sentiments toward the vaccine (12). It has also been demonstrated that the rationale for non-vaccination across all delay and refusal groups was a belief that vaccines are completely unnecessary (15). These unfavorable (hesitant) attitudes are not limited to individuals who refuse vaccination; they also include those who push others to resist immunization (16, 17).

Due to a lack of awareness and a negative attitude, about 87.3% of parents did not support their children's vaccination (12). In the past few years, the CDC has collected data indicating that lack of understanding regarding the HPV vaccination is the leading cited reason for parents choosing not to vaccinate their children (18). Parents regularly delay their decision to vaccinate their children against HPV because they believe their children are at minimal risk of contracting the virus (12, 18). Even yet, their unfavorable beliefs and attitudes, as well as their lack of immunization information, may gradually reduce the rate of HPV vaccine uptake (19).

There are 29,43 million women in Ethiopia aged 15 and older who are at risk for having cervical cancer. Approximately 4.7% of women in the general population are believed to be infected with HPV types 16 and 18 at any given time, and 67.9% of invasive cervical malignancies are ascribed to HPV types 16 and 18. In Ethiopia, the incidence of HPV infection and cervical cancer is rising. Statistics suggest that each year there are 6,294 new cases of cervical cancer and 4,884 deaths among women. In Ethiopia, cervical cancer is the second most prevalent cancer, a significant reproductive health issue, and the leading cause of morbidity and death among women relative to all other cancers (3, 20). The Ethiopian government released the HPV on December 3, 2018. As a preventative measure against cervical cancer,

it mandates the administration of the HPV vaccination to females between the ages of 9 and 14, both in and out of school. Currently, it is being immunized against HPV infection using the two recently licensed subunit vaccines, HPV 2 and 4. Even if the two vaccinations have the potential to reduce cervical cancer morbidity and death in the long run, their introduction in Ethiopia is likely to face various obstacles (20). This is due to a dearth of qualified personnel, diagnosis and treatment facilities, and professional risk factors, such as a lack of public awareness, poverty, and political instability. It is expected that HPV infection and cervical cancer will be widespread, which poses a threat to future generations and raises the cost of health care, severely damaging the nation's economy. As a result, the HPV vaccination has been made available to school-aged and non-school-aged girls aged 9 to 14 as a preventative measure against cervical cancer.

To the best of our knowledge, no research have been undertaken in Ethiopia evaluating knowledge and attitude towards the HPV vaccine. Consequently, identifying community-based specific factors influencing knowledge and attitude toward the Human Papillomavirus vaccine will provide important baseline information for future intervention vaccination among parents of daughters aged 9 to 14 in the Meta Robi District, West Shoa Zone, Oromia Regional State, Ethiopia, 2021 (21, 22).

MATERIALS AND METHODS

The study was conducted in Meta Robi District, from February 01, 2021, to 30, 2021. Meta Robi District is located in the West Shoa Zone, Oromia Region State of Ethiopia, 100 km away from the capital city, Addis Ababa. Meta Robi District has 3 urban and 23

Supplementary information The online version of this article ([Tables/Figures](#)) contains supplementary material, which is available to authorized users.

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rural kebeles and has a total population of 110,491 of whom 55,245 were males and 55,246 were females (23).

Study Design Sample Size and Sampling Procedures

A community-based cross-sectional study design was conducted to assess knowledge and attitudes towards the HPV vaccine and its associated factors among parents of daughters aged between 9 and 14 years. The households that had daughters aged between 9 and 14 years and the residents of the study area in a randomly selected kebele were a sampling unit of this study. The required sample size was determined by using a single population proportion formula considering the following assumptions: the proportion of 50%, 95% confidence interval, 5% margin of error, and considering 10% non-response rate and a design effect of 1.5, the calculated total sample size was 633. The district had 26 kebeles (small units of administration) (3 urban kebeles and 23 rural kebeles), and the kebeles were stratified into urban and rural. From these, 8 kebeles were selected by lottery method (7 urban and 1 rural). The study units were identified by the census, then a total of 8544 households with daughters aged between 9 and 14 years in the selected kebeles were registered and coded through a house-to-house survey. Afterward, the calculated sample size was proportionally allocated to the size of households with a daughter's age between 9-14 years for each selected kebele. Finally, a total of 633 households with daughters aged between 9-14 years were selected by using a systematic random sampling technique. Eight trained B.Sc. Nurses collected data under the supervision of four public health experts using a pretested structured questionnaire adapted by reviewing previously published similar articles and other relevant literature (24, 25) (Figure 1).

Data Management and Analysis

Data quality was assured through a pre-test on 5% of the total sample size in different sub-districts of the study area. Data were cross-checked daily for completeness; accuracy, clarity, and consistency immediately and necessary corrections were made. The collected data were coded, and data cleaning was done by running the frequency of variables

using IBM SPSS version 21.0 (IBM Corp., Armonk, NY, USA) software before analysis; any identified errors were corrected, and IBM SPSS version 21.0 also used for data analysis. Descriptive analysis like frequency and percentage was carried out to describe the sociodemographic characteristics of the respondents, their knowledge, and attitudes related to HPV vaccination among parents of daughters aged between 9 and 14 years old, and the results were presented in texts and tables.

The knowledge and attitude questions were recorded as 'correct' for option 'yes' and 'incorrect' for options 'no' and 'I don't know. The bivariate and multivariate analyses were done using binary logistic regression to identify factors associated with knowledge and attitude towards the HPV vaccine among parents of daughters aged between 9 and 14 years. Candidate variables for the final model (multivariate binary logistic regression) were identified using a binary logistic regression model at a p-value of less than 0.25, and the final model multiple logistic regression was done to see the independent effect of each explanatory variable on the study variable at a p-value of less than 0.05.

Terms and Operational Definition

Knowledgeable. There was three subsections- namely knowledge of cervical cancer, knowledge of HPV infection, and knowledge of HPV vaccine with a possible maximum score of 22. The three sections on knowledge of cervical cancer, knowledge of HPV infection, and knowledge of the HPV vaccine have 7, 6, and 9 knowledge related items respectively. For knowledge of HPV vaccination, the knowledge score ranged from 0-9 depending on whether the respondents answered correct or incorrect answers by assigning 1 mark for each correct answer and 0 for incorrect responses. The total score was computed and scores above and below the mean could be considered as not knowledgeable (poor knowledge); while a score greater than the mean was represented as knowledgeable (good knowledge). The same approach has been used in overall knowledge (26, 27).

Attitude. For the attitude of HPV vaccination, the attitude score ranged from 0-8 depending on whether the respondent answered correct or incorrect answer

by assigning 1 mark for each correct answer and 0 for incorrect response. The total score was computed and scores of mean and below the mean could be considered as favorable attitude while a score greater than the mean was represented as unfavorable attitude regarding the HPV vaccine (26, 27).

Wealth Index. It was characterized by some fixed assets that were commonly found in the study area and analyzed by the major element analysis technique and grouped into three categories (poor, medium, and rich).

RESULTS

Socio-demographic Characteristics

Out of a total of 633 expected study participants, 619 of them participated in this study, which makes for a 97.8% response rate. The mean age of the respondents was 35.13 (± 7.69) years and a majority of the respondents, 527 (85.1%) were rural by residence, 469 (75.8%) were females, 339 (54.8%) were orthodox Christian by religion, 566 (91.4%) of the respondents were Oromo by ethnicity, and 557 (90.0%) were married, 169 (31.7%) of the respondents had completed college and above, and 329 (53.2%) were farmers (Table 1).

Knowledge of Parents toward HPV Infection

Among study participants, nearly half (327(52.8%) had heard about HPV infection; of those who had heard about HPV infection, 316 (51.1%) of the parents were knowledgeable about HPV infection and 312 (50.4%) knew that HPV is a sexually transmitted infection. Overall, 314 (50.7) parents knew that cervical cancer is caused by the infection of HPV, 290 (46.8) knew that HPV infection is preventable, and 323 (52.2) parents were knowledgeable that condoms can protect against HPV infection

Knowledge of Parents toward Cervical Cancer

Out of a total, 336 (54.3%) of respondents had heard about cervical cancer and 332 (53.6%) of parents were knowledgeable about cervical cancer. From those who had heard, the majority, 330 (98.2%) of parents were knowledgeable that cervical cancer is a serious disease and could result in death, and

323 (52.2%) knew that cervical cancer could be treated if diagnosed early. Three hundred twenty-three (52.2%) of parents were knowledgeable that cervical cancer is preventable and 329 (53.1%) of the parents responded that cervical cancer could affect the relationship between partners.

Knowledge of Parents toward HPV vaccine

Out of the total respondents, 338 (54.6%) had heard about the HPV vaccine from different sources. Of those who had heard about the HPV vaccine, the mass media were the most common source of knowledge, 301 (48.6%), followed by health professionals, 230 (37.2%). Out of the total respondents, 277 (44.7%) knew that the HPV vaccine is used to prevent cervical cancer; 182 (29.4%) knew the dosage and intervals of the vaccine, while 437 (70.6%) did not; and 214 (34.6%) of the respondents knew where the HPV vaccine was given; and 262 (42.3%) knew that the HPV vaccine was offered free of charge by the government. This study revealed that out of a total of 242 (39.1%) of the respondents were knowledgeable about the HPV vaccine, while 477 (60.9%) of the respondents were not knowledgeable (Table 2).

Attitude of Parents toward HPV vaccine

Out of 332 respondents, 332 (53.6%) believed in the health benefits of getting the HPV vaccine; 250 (40.4%) believed the HPV vaccine is effective in preventing cervical cancer; and 303 (48.9%) believed the HPV vaccine can cause infertility. Out of the total, 256 (41.4%) thought that two doses of the HPV vaccine should be received and 319 (51.5%) believed that it was important to complete all two doses. Out of the total respondents, 275 (44.4%) thought that it was best to administer the HPV vaccine before sexual initiation. This study revealed that out of the total 249 (40.2%) of the respondents had favorable attitudes towards the Human Papillomavirus vaccine, while 370 (59.8%) of the respondents had unfavorable attitudes (Table 3).

Factors Associated with Knowledge of Parents toward HPV vaccine

Age, marital status, residence, educational status, and wealth status were analyzed with bivariate logistic regression to identify determinants of knowledge

of parents toward the HPV vaccine. Variables that were associated with knowledge of parents toward HPV vaccine at P-value less than 0.25 in the bivariate binary logistic regression analysis were included in multivariate binary logistic regression analysis to identify the independent predictors of knowledge of parents regarding the HPV vaccine. Age, residence, and wealth status were found significantly associated with knowledge of parents toward the HPV vaccine at a p-value less than 0.05.

Respondents who were less than 30 years were 1.98 times more likely knowledgeable about the HPV virus vaccine as compared with those respondents whose age was greater than or equal to 40 years (AOR= 1.98, 95%CI: 1.07, 3.69). Urban residents were 3.6 times more likely knowledgeable about the HPV vaccine as compared with rural residents (AOR= 3.6, 95%CI: 1.45, 8.92). Those respondents from the rich household were 1.89 times more likely knowledgeable about the HPV virus vaccine as compared with their counterparts poor parents (AOR= 1.89, 95%CI: 1.09, 3.26).

Factors Associated with Attitude of Parents toward HPV vaccine

Age, marital status, residence, educational status, and wealth status were analyzed with bivariate logistic regression to identify determinants of the attitude of parents toward the HPV vaccine. Variables that were associated with the attitude of parents toward the HPV at a P-value less than 0.25 in the bivariate binary logistic regression analysis were included in multivariate binary logistic regression analysis to identify the independent predictors of the attitude of parents toward the HPV vaccine. All of the variables were not found to have any significant association with the attitude of parents toward the HPV vaccine at a p-value less than 0.05 (Table 4).

DISCUSSION

The study was conducted to assess the knowledge and attitude toward the HPV and associated factors among parents of daughters aged between 9 and 14 years in the Meta Robi district. In this study, the proportion of parents who were knowledgeable about

HPV vaccination was found to be only 39.1%. The result of this finding is consistent with the studies conducted in Italy and Bamako Mali, where about 42.1% and 47.3% of parents were knowledgeable about the HPV, respectively (28, 29).

However, the result of this study's finding was lower than the studies conducted in Korea, France, and Nigeria, where 76.2%, 96.6%, and 98.9% of parents were knowledgeable about the HPV vaccine, respectively (30, 31, 32). However, the result of this study was higher than the study reported from the United States of America in which only 29.2% of parents were knowledgeable about the HPV (33). The variation observed can be explained by the differences in the study participants' sociodemographic status, sample size and study period, cultural norms, access to information, and the involvement of numerous campaigns by both public and private sectors.

The finding of this study indicated that about 40.2% of parents had a favorable attitude toward HPV vaccination, which is comparable to a study conducted in Cameroon that 45.6% of respondents had a favorable attitude toward the HPV virus vaccine (34). However, this study finding was lower when compared with the study findings reported from Gondar, North West Ethiopia, Nigeria, and Zambia in which 59.9%, 84%, and 85.5% of study participants had favorable knowledge about the HPV vaccine, respectively (26, 35, 36). Similarly, the result of this study was lower than the study conducted in France, Korea, and the United States of America in which 54.3%, 70%, and 93.4% of respondents had a favorable attitude about the HPV (30, 28, 32). This could be due to the participant's differences in sociodemographic characteristics, sample size, level of information, and study design.

In contrast, the finding of this study was higher than the study conducted in India, in which 13% of respondents had a favorable attitude about the HPV (37). This difference might be due to the study participants' differences in socio-demographic status, access to information, health service coverage, sample size, study design, and study period. The findings of this study revealed that the age of parents was significantly associated with knowledge about the HPV. Parents who were less than the age group

of 30 years were 1.98 times more likely to be knowledgeable about the human papillomavirus vaccine as compared with those parents whose age was greater than or equal to 40 years. The result of this study is consistent with the study conducted in the United States of America (38).

The findings of this study also indicated that the residence of parents was significantly associated with knowledge about the HPV. Urban residents were 3.6 times more likely to be knowledgeable about the HPV as compared with rural residents. This finding was in line with the studies conducted in North India and the United States of America (37, 38). This might be due to urban residents being closer to health facilities and having more access to health information.

Similarly, the result of this study showed that the wealth status of parents was significantly associated with knowledge about the HPV. Rich parents were 1.89 times more likely to be knowledgeable about the HPV than their counterparts, the poorest parents. This finding is consistent with the study conducted in Gondar (26). When a person becomes economically wealthy, they may have extra money to be allocated for the help of their health in addition to basic needs. Moreover, those parents who have improved wealth may have a better chance of getting access to mass media like radio, television, and another source of information about the HPV.

CONCLUSIONS

This research demonstrated that knowledge and attitudes towards immunization against human papillomavirus are very poor.

Age, location, and socioeconomic level were substantially linked with HPV vaccination knowledge. Thus, age, residence, and socioeconomic level were the determinants of parental knowledge of the HPV vaccination revealed in this study.

Strive for program coverage and access to the HPV vaccination, but only if all eligible families in the community have enough knowledge and a positive attitude toward taking the vaccine correctly and regularly. Increasing awareness, understanding, and positive attitudes regarding HPV vaccination activities

is required at all levels of eligible households.

The primary major element in lowering cervical cancer morbidity and death is the issue of women's health. It is vital to raise public awareness via education on cervical cancer and its prevention. Encourage the identification and recording of all vaccinated and unimmunized females aged 9 to 14 years, as well as the provision of ongoing health education and health promotion to parents during the home visit regarding the benefits of the human papillomavirus vaccination.

Concurrently, community-level education should be conducted about the administration of HPV vaccines prior to sexual beginning.

Policymakers and other shareholders must do greater effort to offer a resource to improve understanding and attitudes about the HPV vaccination through the media and other health education channels.

Further research with a different research design should be undertaken to investigate the factors influencing the knowledge and attitude of parents regarding HPV, as well as other variables not covered in this study.

INFORMATION

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Authors Contribution. HH, MA, ND, MA carried out all the conception and designing of the study, data collection, performed the statistical analysis, wrote the final report, and reviewed and edited the manuscript's final draft. All of the authors read and approved the final manuscript.

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Ethical Approval and Consent to participate. Ethical clearance was obtained from the Ethical Review Board of Ambo University College of Medicine and Health Sciences, with the Ref. No of: PGC/112/2021. Hierarchically all administrative bodies were communicated and permission was secured. Written informed consent was obtained from the study subjects after explaining the objectives and procedures of the study and their right to participate or to withdraw at any time of the interview. The Research and Ethical Review Committee also approved its ethical issues as there was no procedure that affects the study subject and the data is used only for research purposes. For this purpose, a one-page consent letter was attached to the cover page of each questionnaire stating the general purpose of the study and issues of confidentiality which was discussed by data collectors before proceeding to the interview. Lastly, we confirm that this study was conducted in accordance with the Declaration of Helsinki.

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TABLE 1: Socio-demographic characteristics of parents of daughters' age between 9-14 years in Meta Robi District, Oromia Regional State, Ethiopia, February 2021 (n=619).

Socio-demographic characteristics of respondents (n=619)	Frequency	
	N	%
Age		
< 30 years	196	31.7
30-39 years	234	37.8
> = 40 years	189	30.5
Residence		
Rural	527	85.1
Urban	92	14.9
Sex of respondents		
Female	469	75.8
Male	150	24.2
Ethnicity		
Oromo	566	91.4
Amhara	53	8.6
Religion		
Orthodox	339	54.8
Protestant	274	44.3
Others*	6	1
Marital status		
Single	12	1.9
Married	557	90.0
Divorced	21	3.4
Widowed	26	4.2
Separated	3	0.5
Level of education		
Illiterates	140	22.6
primary	104	16.8
Secondary	151	28.9
Certificate and above	71	31.7
Occupation		
House wife	161	26.0
Farmers	329	53.2
Merchants	27	4.4
Governmental	56	9.0
NGOs	9	1.5
Daily labor	26	4.2
Others**	11	1.7
Wealth index		
Poor	196	31.7
Medium	217	35.1
Rich	206	33.3

Notes: Field Survey 2021; wakefata*, Muslim*; merchant**, Daily labor**, and student**.

TABLE 2: Knowledge of parents of daughters' age between 9-14 years toward HPV infection, cervical cancer, and HPV vaccine, in Meta Robi District, Oromia Regional State, Ethiopia, February 2021 (n=619).

Knowledge of Parents toward HPV Infection (n=619)	N	%
Have you heard about HPV infection		
Yes	327	52.8
No	292	47.2
Do you know about HPV infection		
Yes	316	51.1
No	303	48.9
Cervical cancer is caused by HPV		
Yes	314	50.7
No	305	49.3
Cervical cancer is sexually transmitted infection (STI)		
Yes	312	50.4
No	307	49.6
Using condom can prevent HPV infection		
Yes	290	46.8
No	329	53.2
HPV infection is preventable		
Yes	323	52.2
No	296	47.8
Have you heard about cervical cancer		
Yes	336	54.3
No	283	45.7
Source of Information		
Health profession	230	37.2
From Friends	88	14.2
Mass media	301	48.6
Do you Know about cervical cancer		
Yes	332	53.6
No	294	46.4
Cervical cancer can be treated if early diagnosed		
Yes	323	52.2
No	296	47.8
Cervical cancer can cause a death		
Yes	330	53.3
No	289	46.7
Cervical cancer is preventable		
Yes	323	52.2
No	296	47.8
Cervical cancer is a serious disease		
Yes	324	52.3
No	295	47.7
Cervical cancer can affect the relationship between husband and partner		
Yes	329	53.1

Continued on next page

Table 2 continued

No	290	46.9
Have you heard about HPV vaccine		
Yes	338	54.6
No	281	45.4
Source of Information		
Health profession	230	37.2
From Friends	88	14.2
Mass media	301	48.6
Do you know HPV Vaccine		
Yes	292	47.2
No	327	52.8
HPV vaccine used to protect cervical cancer		
Yes	277	44.7
No	342	55.3
Do you know the recommended interval between doses of HPV vaccine		
Yes	182	29.4
No	437	70.6
Do you know that the government offer HPV vaccine free of charges		
Yes	262	42.3
No	357	57.7
Do you know for which age group the vaccine is recommended		
Yes	201	32.5
No	418	67.5
Do you know where the HPV vaccine given		
Yes	214	34.6
No	405	65.4
Do you know who should be vaccinated		
Yes	217	35.1
No	402	64.9
Who		
Girls	217	35.1
Boys	2	0.3
I don't know	400	64.6
Overall Knowledge		
Good Knowledge	242	39.1
Poor Knowledge	377	60.9

HPV IN ETHIOPIAN 9-14 YEAR GIRLS

TABLE 3: Attitude of parents daughters' age between 9-14 years toward HPV vaccine in Meta Robi District, Oromia Regional State, Ethiopia, February 2021 (n=619).

	N	%
Do you think HPV vaccine has health benefit		
Yes	332	53.6
No	287	46.4
Do you think HPV vaccine is effective in protecting against cervical cancer		
Yes	250	40.4
No	369	59.6
Do you think that HPV vaccine can cause infertility		
Yes	303	48.9
No	316	51.1
Do you think that two doses of HPV vaccine should be received		
Yes	256	41.4
No	363	58.6
Do you think that it's important to complete all two doses of HPV vaccine		
Yes	319	51.5
No	300	48.5
Do you think that it's best to admitters HPV vaccine before sexual initiation		
Yes	275	44.4
No	344	55.6
Do you think that HPV vaccine can prevent HPV infection		
Yes	307	49.6
No	312	50.4
Do you think that HPV vaccine is dangerous for your daughters		
Yes	313	50.6
No	306	49.4
Overall attitude		
Positive attitude	249	40.2
Negative attitude	370	59.8

TABLE 4: Predictors of knowledge and attitude about HPV vaccine among parents of daughters age between 9-14 years in Meta Robe District, West Shoa Zone, Oromia Regional State, Ethiopia, February 2021 (n=619).

Variables	Knowledge	Status	COR (95%CI)	AOR (95%CI)	P
	Poor knowledge	Good knowledge			
Age					
< 30 years	107 (54.7%)	89 (45.4%)	1.79 (1.18, 2.71) *	1.98 (1.07, 3.69)	0.03*
30-39 years	141 (60.3%)	93 (39.7%)	1.42 (0.95, 2.12)	1.12 (0.62, 2.03)	0.7
> = 40 years	129 (68.3%)	60 (31.7%)	1		
Marital status					
Married	329 (59.1%)	228 (49.9%)	2.95 (.98, 8.87)	1.61 (0.24, 10.83)	0.63
Others	48 (77.4%)	14 (22.6%)	1		
Residence					
Urban	28 (30.4%)	64 (69.6%)	4.48 (2.78, 7.24)*	3.6 (1.45, 8.92)	0.006*
Rural	349 (66.2%)	178 (33.8%)	1		
Education					
Illiterates	94 (67.1%)	46 (32.9%)	1		
Primary	65 (62.5%)	39 (37.5%)	1.23 (.72, 2.08)	1.65 (0.8, 3.41)	0.17
Secondary	116 (64.8%)	63 (35.2%)	1.11 (.69, 1.77)	1.52 (0.71, 3.41)	0.28
College & above	102 (52%)	94 (48%)	1.89 (1.2, 2.96) *	1.9 (0.67, 5.39)	0.23
Wealth Status					
Poor	111 (56.6%)	85 (43.4%)	1		
Medium	143 (65.9%)	74 (34.1%)	11.17 (5.65, 22.1)*	1.59 (0.99, 2.56)	0.52
Rich	123 (59.7%)	83 (40.3%)	4.87 (2.41, 9.85) *	1.89 (1.09, 3.26)	0.022*
Attitude					
	Negative attitude	Positive attitude			
Residence					
Urban	28 (30.4%)	64 (69.6%)	4.23 (2.62, 6.82)*	1.76 (0.47, 6.57)	0.43
Rural	342 (64.9%)	185 (35.1%)	1		
Education					
Illiterates	91 (65%)	49 (35%)	1		
Primary	66 (63.5%)	38 (36.5%)	0.93 (0.57, 1.51)	1.27 (0.49, 3.27)	0.62
Secondary	112 (62.6%)	67 (37.4%)	1.16 (0.71, 1.89)	0.76 (0.27, 2.09)	0.59
College & above	101 (51.5%)	95 (48.5%)	2.41 (1.32, 4.40)*	0.83 (0.23, 2.94)	0.77

Crude odds ratio (COR), Adjusted odds ratio (AOR), Confidence interval (CI), *p < 0.05.

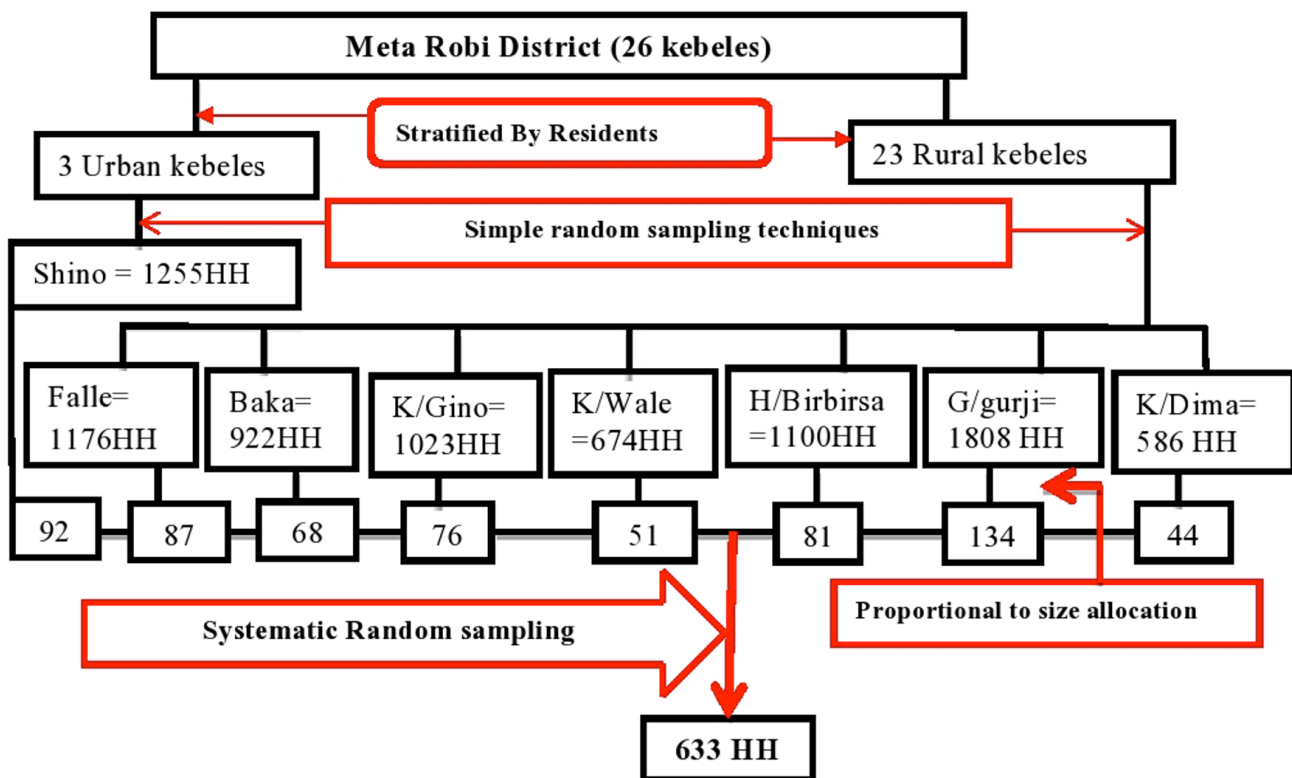


FIGURE 1: Schematic representation of sampling procedure of knowledge and attitude toward the HPV vaccine and its associated factors among parents of daughters aged between 9 and 14 years in the Meta Robi District, West Shoa Zone, Oromia Regional State, Ethiopia, 2021.