

Knowledge and perceptions of parents regarding human papillomavirus vaccination among girls aged 9–14 years attending urban clinics in Lusaka

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ABSTRACT

Human Papilloma Virus is a group of viruses that infect the skin and moist surfaces of the body including the cervix, anus, penis, mouth and throat. Depending on the type some cause warts while others are a risk factor of cancer most commonly cervical cancers. Human Papilloma Vaccination reduces the risk of cancers by sensitizing the immune system to block High risk HPV types from causing cancer. This study assessed the knowledge, perceptions, and utilization determinants of parents regarding Human Papillomavirus (HPV) vaccination for girls aged nine to fourteen years in Lusaka Urban, Zambia. This study was guided by the Health Belief Model which gives the point that individuals willingness to changes is based on their perceptions of health threats and the benefits they believe they have based on taking actions. The Study population was estimated at approximately 10,143 girls aged between 9-14 in Mtendere, Kamwala, and Kalingalinga, which was derived from the 2022 census ward total and the National Age distribution pattern. A probability sampling technique selected 200 participants (185 for quantitative questionnaires, 15 for qualitative interviews). A mixed-methods research strategy was used, using a cross-sectional convergent parallel study design. This approach was ideal for meeting the study objectives because it allowed for the simultaneous collection of quantitative data to measure parental knowledge and qualitative data to investigate parental attitudes within a single research period. Quantitative data were analyzed using descriptive statistics. Qualitative data was thematically analyzed. The results showed that 63.78% of respondents had heard of HPV, and 69.73% were aware of its link to cervical cancer. However, 36.22% were unaware of the virus. Qualitative findings showed varied parental attitudes. Many supported the vaccine, but hesitations remained regarding long-term side effects and cultural sensitivities. For vaccine utilization, 68.65% were aware of the HPV vaccine. Misconceptions were present: 21.6% believed the vaccine causes infertility, 18.9% believed it encourages early sexual activity, and 20.2% assumed it loses its effectiveness after sexual activity. This study states that while the baseline knowledge is present misinformation limits vaccination. The study illustrated that the Ministry of health should use and enhance community-based workshops including some local media to provide accurate information about vaccination of HPV.

Keywords: Cervical Cancer; Health Belief Model, HPV Vaccination; Parental Perception; Lusaka Urban Clinics; Vaccine Utilization

I. INTRODUCTION

The DNA virus known as human papillomavirus (HPV) attacks the skin and mucous membranes. Persistent infections can cause epithelial lesions and malignancies (WHO, 2021). Because there is no treatment for HPV, vaccination is the primary means of avoiding the condition. Available vaccinations protect against two, four, or nine HPV types. All approved versions offer protection against HPV 16 and 18, the types that cause the majority of cervical malignancies. According to research, HPV vaccine can prevent over 70% of cervical cancers, 80% of anal cancers, 60% of vaginal cancers, 40% of vulvar cancers, and certain mouth cancers (Akinlemi, 2026). The vaccination also protects against anogenital warts and associated tumors (Kester et al., 2013).

Despite the vaccine's established advantages, uptake is poor among girls aged nine to fourteen, the recommended age for inoculation. Parental knowledge and views are the most important variables determining whether girls in this age range are vaccinated. Previous studies have found a significant relationship between parental views and kid immunization rates (Jassim et al., 2018). For example, cross-sectional studies show that parental decisions strongly impact participation in cervical cancer preventive programs (Ncube et al., 2015). While high-income nations have attained significant HPV vaccination coverage, Zambia's uptake is still low. The particular causes for the poor utilization of urban clinics in Lusaka are unclear. These government clinics serve as primary healthcare centers and were selected for this study based on their accessibility, the researchers' familiarity with the sites, and the high concentration of the

target population. This study investigates parental awareness and perceptions regarding HPV vaccination for girls aged nine to fourteen in these clinics. The objective is to identify the factors that influence parental decision-making to help develop interventions that improve vaccine acceptance and reduce cervical cancer incidence in Zambia.

1.1 Statement of the Problem

Cervical cancer has been rising and this is due to many factors. IN 2024 alone, there were about 604,000 new cases of cervical cancer globally making it among the top 5 most commonly diagnosed cancers in women annually (Jouya et. al 2026). The Global Cancer Observatory concludes that cervical cancer is still a major public health challenge inspite there being HPV vaccination and screening which is widely implemented among various communities affecting mostly low to middle income countries.

Pap Smear tests can help reduce cervical cancer mortalities but has an overall sensitivity of 90% at regular screening. In Rural and peri urban regions there is still a high mortality rate due to cervical cancer among women. In Zambia the Vaccine intake remains low, which leads to the countries high incidence of cervical cancer. Understanding the barriers to vaccine acceptance is important and these include knowledge deficits, safety concerns, parents fear of the impact on sexual behavior and also lack of recommendations (Holman et al 2014). Based on the above the specific drivers of low HPV vaccin usage still remain unclear and this study worked on providing empirical investigation in local clinical settings. Zambia launched its national HPV vaccination initiative in 2013, aiming to immunize 50,000 girls within two years. The early implementation faced significant operational difficulties due to parental reluctance to provide consent (Liu et al., 2012). By the end of the initial phase, 96% of the 25,000 girls targeted had been vaccinated (Mwanahamuntu, 2013). Nonetheless, comprehending the underlying parental attitudes is essential for enhancing and maintaining long-term vaccine uptake. This research investigates parental awareness and perceptions of the HPV vaccine in the context of Zambian public health. Recognizing these specific elements is crucial for developing targeted strategies that promote vaccine acceptance and mitigate the national cervical cancer incidence.

1.2 Research Objectives

- i. To assess the knowledge of parents on HPV vaccination to children aged nine to fourteen years in Lusaka Urban.
- ii. To identify the perceptions of parents on HPV vaccination for children aged nine to fourteen years in Lusaka Urban.
- iii. To explore ways to improve utilization of HPV vaccination to children aged nine to fourteen years in Lusaka Urban

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Health Belief Model

The Health Belief Model was one of the frameworks used in this study, it explains and predicts health behaviors based on individual attitudes and beliefs. This framework is common with the nursing proffesion with emphasis on patient compliance and preventive healthcare practices. The Model helps understand the reason why patients adopt or do not adopt recoomended preventive care aids and activities by helping pin point the motivation and factors associated with the decisions they will make.

2.2 Empirical Review

2.2.1 Knowledge on HPV vaccination to children

The existing research demonstrates significant geographical disparities in parental comprehension of Human Papillomavirus (HPV) and its vaccination. For example, Asiimwe (2023) found that women in Uganda are highly aware of the advantages of childhood vaccination (93.5%), but Javier et al. (2013) found that parents in the Philippines are far less knowledgeable with HPV (39.3% of moms and 35.5% of fathers). Knowledge of viral transmission varies by place. In India, Mittal et al. (2018) found that 61.5% of moms understood how HPV is spread. When the relationship between HPV and cervical cancer was investigated, knowledge levels ranged from 70.1% among Kenyan women (Oyugi et al., 2019) to 48.1% among women in the United States (Jackson et al., 2013). The understanding of preventative and risk factors is similar. In Malawi, 68.2% of women identified condom usage as a partial preventative approach (Kalua et al., 2015), while in Zimbabwe, 82.9% were aware that infection could be avoided (LaMontagne et al., 2022). In terms of behavioral hazards, 78.9% of Ethiopian women comprehended the relationship between several sexual partners and higher HPV risk (Assefa et al., 2019, whereas 71.4% of Tanzanian women were aware that anybody who was sexually active may catch the virus (Jeckoniah, 2018).

2.2.2 Perceptions of Parents on HPV vaccination

Parental hesitancy over the HPV vaccination is common. According to Javier et al. (2013) and Kalua et al. (2015), parents have diverse perspectives on vaccination acceptability. Safety concerns are a key hurdle; Jackson et al. (2013) and Shetty et al. (2018) discovered that parents typically worry about unpleasant side effects and the vaccine's long-term safety. This uncertainty is evident in Zambia, where Liu et al. (2012) found that parents and guardians were hesitant to consent to their children's inoculation. Parents rely on their cultural backgrounds, for information and attitudes towards many health related matters. Oketch et al. (2019) discovered that healthcare providers, community leaders, and the media are the primary influencers of parental opinion. Despite this, parents sometimes misinterpret the long-term efficacy of the vaccination. Mpelwa et al. (2017) found that parents usually lack a clear grasp of how the vaccination protects cervical cancer. According to LaMontagne et al. (2022), cultural norms, religious beliefs, and societal expectations all have a significant impact on parental decisions. Because of these deep-rooted cultural influences, health communication strategies must be adapted to fit local contexts to effectively reduce vaccine hesitancy.

2.2.3 Strategies to improve Utilization of HPV Vaccination

Increasing HPV vaccination uptake involves initiatives that directly target awareness, access, and misinformation. In areas with moderate baseline awareness, such as China, Perkins et al. (2015) found that healthcare providers operate as the major information source. Lima et al. (2018) found that vaccine promotion is driven by schools in Brazil. In locations where general knowledge is lower, as shown by Asiimwe (2023) and Alene et al. (2020), educational initiatives must be adapted to the unique local environment. Kalua et al. (2015) found that parental support for vaccination of females aged 9 to 14 is often robust. Parents choose different venues to receive the immunization (LaMontagne et al. 2022) and Mpelwa et al. (2017) documented these diverse site choices, implying that health initiatives must provide flexible access via health clinics, community locations, and schools. Confusion about the optimal age for immunization also influences adoption. Jackson et al. (2013) and Basu et al. (2018) found conflicting viewpoints on this subject, suggesting that public health campaigns must properly explain the justification for the pre-adolescent schedule. Incorrect information remains a major barrier. Basu et al. (2018) and Kalua et al. (2015) highlighted inaccurate ideas regarding infertility and early sexual engagement as significant hurdles to acceptance. Correcting these inaccuracies necessitates direct, evidence-based instruction. To boost general vaccination acceptability, Lima et al. (2018) and Perkins et al. (2015) advocate community participation, systematic educational campaigns, and collaborations with local media and reputable community groups.

III. METHODOLOGY

3.1 Research Design

The study employed a cross-sectional convergent parallel mixed-methods research design, integrating quantitative and qualitative data collection and analysis. Quantitative data were collected to assess parental knowledge and evaluate its relationship with vaccine uptake. Qualitative data were collected to describe parental perceptions and the relationship between the study variables.

3.2 Study Area

The research was conducted in Mtendere, Kamwala, and Kalingalinga within the Lusaka Urban district. These government-owned clinics provide first-level healthcare services. The sites were selected purposively based on accessibility, familiarization, and the availability of the target population.

3.3 Target Population

The target population comprised parents and guardians of girl children aged nine to fourteen years. As of 2022, the total population according to the 2022 Zambia Census of Population and Housing Mtendere 62,744, Kamwala 43,157, and Kalingalinga 38,863 (ZAMSTAT 2022).

3.4 Sampling and Sample Size

A probability sampling technique was utilized to ensure random selection. Inclusion criteria required parents or guardians to have girl children aged nine to fourteen, reside in Mtendere, Kalingalinga, or Kamwala, and provide consent. Exclusion criteria applied to those without eligible children, residing outside the study areas, or declining consent. The sample size was calculated using the Cochran (1977) formula ($z = 1.96$, $p = 0.5$, $e = 0.0693$), yielding a calculated size of 199.9, rounded to 200 participants. The sample was distributed as 185 participants for the quantitative study (Mtendere = 62, Kamwala = 62, Kalingalinga = 61) and 15 participants for the qualitative study (5 from each site).

3.5 Data collection Procedure and tools

Data were collected using structured and semi-structured questionnaires developed by the researcher, serving as both survey tools and interview guides. Validity was established through supervisor review and a pilot study involving 10 respondents at Chilenje market, which allowed for questionnaire adjustments. Reliability was ensured by standardizing the instrument and testing its stability during the pilot study in an environment similar to the main study. Data collection proceeded following the administration of informed consent.

3.6 Data analysis

Quantitative data were analysed using descriptive statistics, specifically frequency distributions and percentages, utilizing Microsoft Word and Excel. Qualitative data from in-depth interviews were analysed using thematic analysis based on Braun and Clarke's (2006) approach. Verbatim transcriptions were compared with field notes, and themes were identified by searching across the entire dataset.

3.7 Ethical Considerations

Ethical approval was obtained from the Cavendish University Zambia Ethics Committee. Participants were informed of the study's purpose and objectives, and written informed consent was obtained prior to data collection. Confidentiality was maintained by excluding names and exact residential addresses, utilizing identification numbers instead. Participation was strictly voluntary, with the right to withdraw at any time without consequence. Participants received no financial compensation, and the study's importance was explained prior to enrolment. Results were shared exclusively with the University Ethics Committee.

IV. FINDINGS & DISCUSSION

4.1 Knowledge of Parents on HPV

HPV transmission knowledge: The sample of 185 individuals, 118 (63.78%) confirmed they know how HPV is transmitted, while 27 (14.59%) stated they do not. Notably, 40 (21.62%) indicated they were unsure about transmission methods. While knowledge about HPV transmission is prevalent, a significant minority still lacks awareness, suggesting educational efforts might be needed to address this gap.

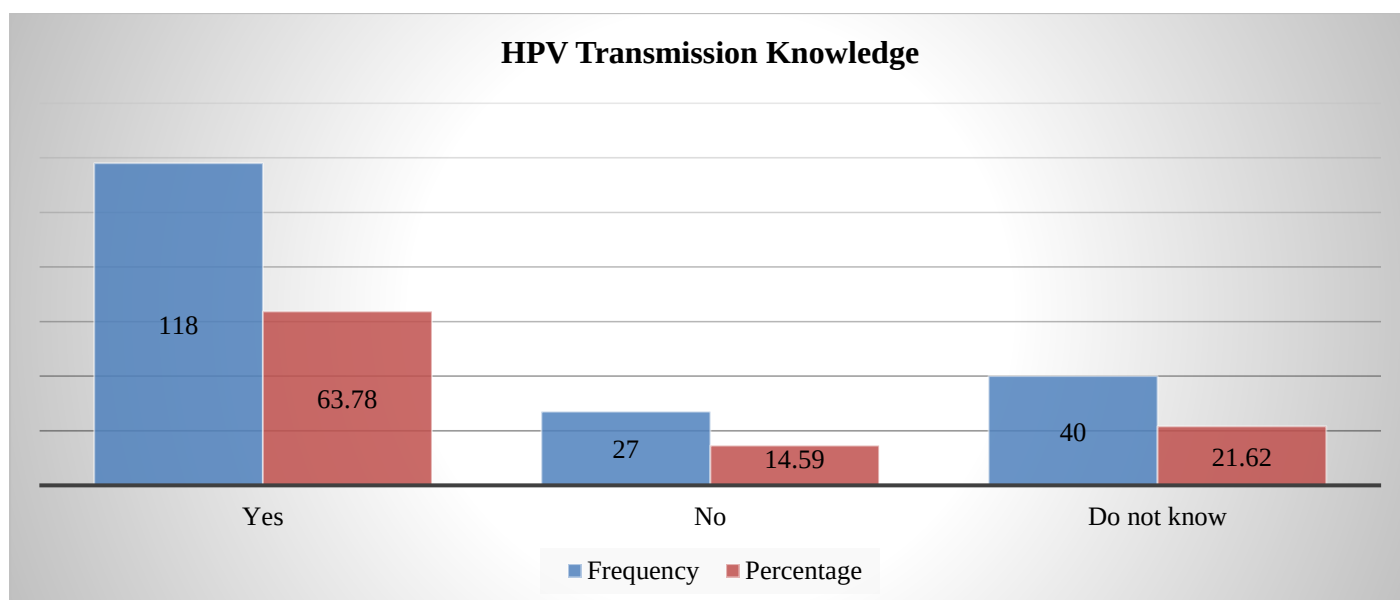


Figure 1

Shows participants' Knowledge on HPV Transmission

4.1.1 Distribution of Knowledge of Parents on HPV

Figure 3 shows the average knowledge levels of parents distributed based on the information known about HPV vaccination most questions respondents answered under the moderate with most of them falling within 63.78 to 69.73 rate of responses, seconded by parents believing that HPV is preventable with 85.95 rate and the also believed that having multiple sexual partners increases the risk of HPV risk sitting at 81.62 of respondents.

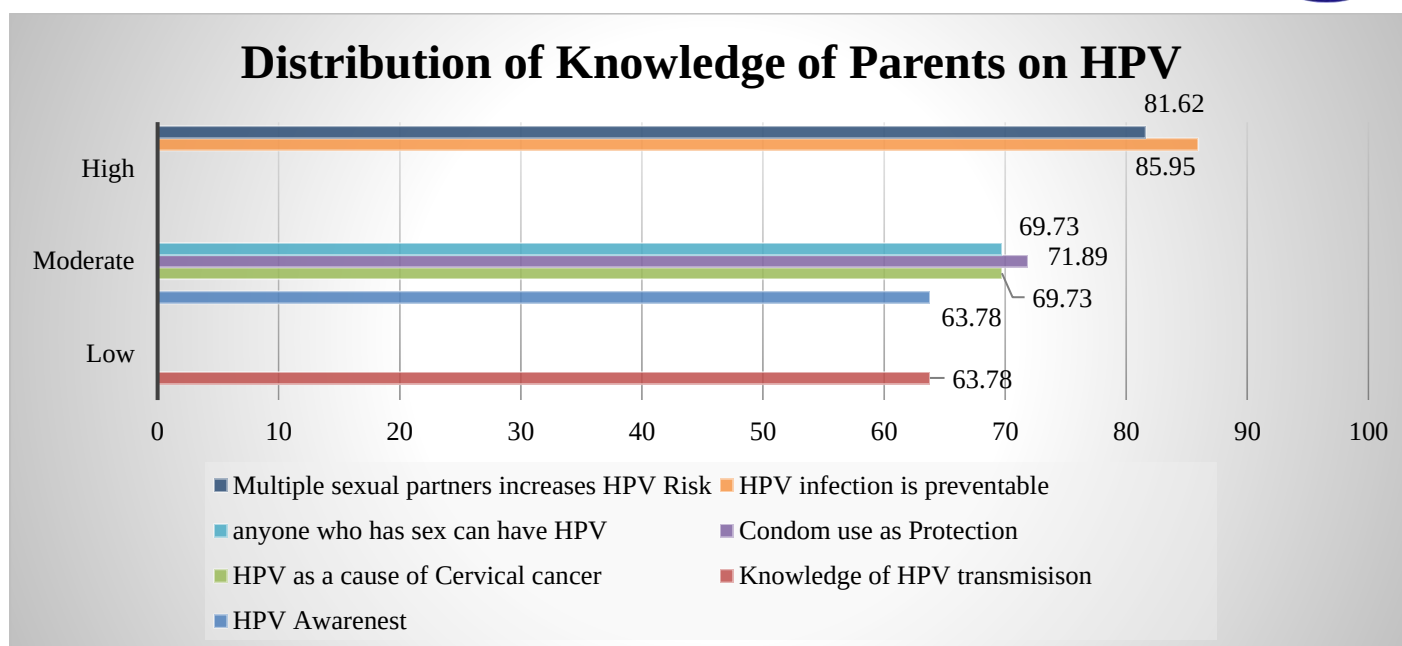


Figure 2
Distribution of Knowledge of Parents on HPV

4.1.2 Perceptions of Parents towards HPV vaccination

Qualitative data derived from 15 participants across Mtendere, Kamwala, and Kalingalinga clinics were synthesized into eight primary themes regarding parental perceptions of HPV vaccination. Theme 1, Attitudes Towards Vaccination, encompassed preventive support, safety hesitations, and trust in medical experts, with participants expressing a dichotomy between recognizing preventive benefits and fearing unknown side effects. Theme 2, Awareness and Information Needs, highlighted baseline understanding deficits, a need for risk clarification, and uncertainty regarding the necessity of the vaccine for pre-adolescents. Theme 3, Concerns and Hesitations, specifically identified long-term health effects, adverse side effects, and age appropriateness as primary barriers to consent. Theme 4, Information Sources, demonstrated reliance on healthcare professionals, Ministry of Health media broadcasts, and community peers for decision-making data. Theme 5, Perceived Effectiveness, ranged from strong confidence in cervical cancer prevention to cautious optimism and uncertainty requiring alternative screening data. Theme 6, Parental Influence and Decision-Making, reflected primary advocacy by parents, collaborative understanding with children, and collective external influences from schools and clinics. Theme 7, Cultural and Societal Factors, documented the sensitivity of sexual health discussions, societal norms, stigma, and the influence of elder opinions on vaccine acceptance. Theme 8, Communication Strategies, yielded participant recommendations for community workshops, one-on-one clinical consultations with nurses, and local media collaborations to improve information dissemination.

Table 1
Showing the major themes on Perceptions towards HPV Vaccination using the Qualitative findings

Theme	Subthemes
1. Attitudes Towards Vaccination	Preventive support, Safety hesitations, Trust in medical experts
2. Awareness and Information Needs	Baseline understanding, Need for risk clarification, Uncertainty of necessity
3. Concerns and Hesitations	Long-term health effects, Adverse side effects, Age appropriateness
4. Information Sources	Healthcare professionals, Ministry of Health/Media, Community peers
5. Perceived Effectiveness	Strong confidence, Cautious optimism, Uncertainty/Alternative seeking
6. Parental Influence and Decision-Making	Primary advocacy, Collaborative understanding, Collective external influences
7. Cultural and Societal Factors	Sensitivity of sexual health, Societal norms and stigma, Elder and community opinions
8. Communication Strategies	Community workshops, One-on-one clinical consultations, Local media collaboration

4.1.3 Utilisation of HPV Vaccination to Children Aged Nine to fourteen years in Lusaka Urban areas

Vaccinating girl children at the age of 9 to 14 years may encourage girl children to indulge in early sexual activity. A specific socio-cultural misconception regarding the behavioural impact of the vaccine was also evaluated. Figure 4 presents parental assumptions concerning whether vaccinating girls aged 9 to 14 years might encourage early sexual activity. The data demonstrate that a predominant majority of 145 respondents (78.4%) rejected this notion. However, a notable minority of 35 respondents (18.9%) affirmed the belief that the vaccine promotes early sexual

indulgence, and 5 respondents (2.7%) expressed uncertainty. Although the majority correctly dismiss this myth, the persistence of this misconception among nearly one-fifth of the sample underscores the necessity for targeted, evidence-based educational interventions to dispel misinformation and facilitate informed parental decision-making regarding vaccine utilisation.

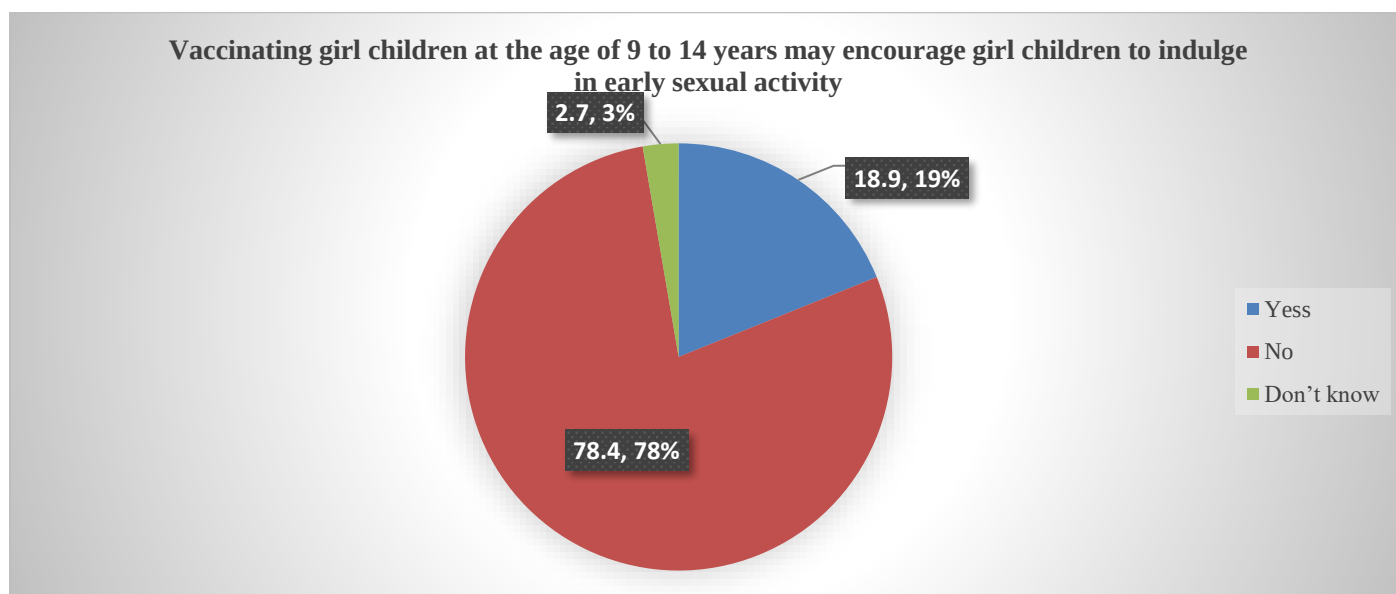


Figure 3
showing the Parents' Assumption about the Utilisation of Vaccinating Girls Aged 9-14 and Whether it will Impact Them in Indulging in Early Sexual Activity

Awareness of HPV Vaccine among Parents: The assessment of HPV vaccine utilisation revealed a moderate baseline of awareness among the surveyed parents and guardians. As illustrated in Figure 5, 127 out of 185 respondents (68.65%) reported having heard of the HPV vaccine, while 58 respondents (31.35%) indicated they had no prior knowledge of its existence. This distribution indicates that while a majority possess foundational awareness of the vaccine, a substantial minority remains entirely uninformed, representing a critical barrier to optimal vaccine uptake.

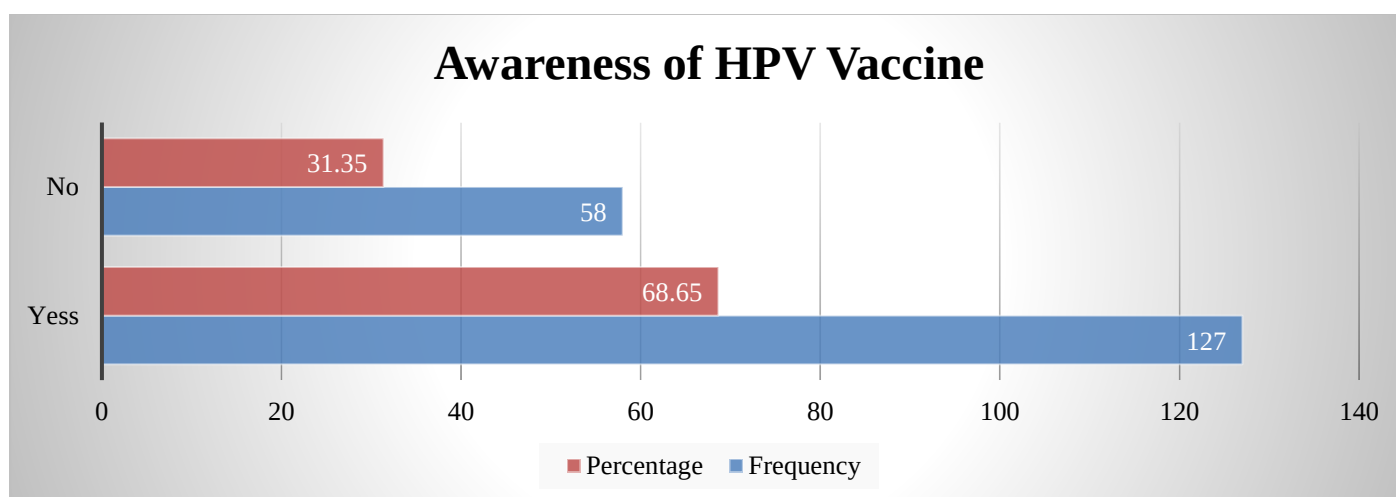


Figure 4
Showing the Awareness Levels of Parents towards HPV Vaccine Utilisation

4.2 Discussion

4.2.1 Knowledge of Parents on HPV Vaccination

According to the data, 63.78% of the 185 respondents had heard of HPV, with an identical proportion understanding its transmission mechanisms. Furthermore, 69.73% recognized the relationship between HPV and cervical cancer, while 86.5% agreed that the infection may be avoided. The majority, 81.62%, recognized several sexual partners as a risk factor for viral transmission. These numbers suggest reasonable baseline awareness, but knowledge gaps exist, notably among the 36.22% of respondents who are completely uninformed of the virus. Asimwe (2023) discovered that 93.5% of Ugandans were aware of the advantages of childhood immunizations. In contrast, Javier et al.

(2013) discovered a lower baseline awareness in the Philippines, with just 39.3% of mothers aware of HPV. Concerning the link to cervical cancer, 69.73% is consistent with the 70.1% reported by Oyugi et al. (2019) in Kenya, but differs from the 48.1% shown by Jackson et al. (2013) in the United States. The comprehension of prevention (86.5%) is similar to the 82.9% reported by LaMontagne et al. (2022) in Zimbabwe. The findings show that, while basic information exists in the research area, it is inconsistent when compared to places with established immunization awareness campaigns.

4.2.2 Perceptions of Parents Towards HPV Vaccination

There were 15 interviews done with parents and guardians which revealed different attitudes towards HPV vaccination. Based on the findings some expressed support when it came to the benefits, others exhibited hesitations regarding potential effects and long-term health impacts. These participants identified healthcare professionals, local media and community peers as primary information sources. Cultural sensitivities surrounding sexual health were noted as influential factors shaping parental perceptions. Respondents suggested community seminars, direct consultations with nurses, and local media campaigns as successful communication tactics. The combination of vaccination support and safety concerns is consistent with the diverse opinions reported by Kalua et al. (2015) in Malawi and Javier et al. (2013) in the Philippines. Concerns about long-term safety are consistent with the findings of Jackson et al. (2013) and Mittal et al. (2018), who identified adverse impact anxiety as the greatest obstacle to adoption. The dependence on healthcare professionals and community networks for information is consistent with the findings of Oyugi et al. (2019) from Kenya. The influence of cultural norms on health decisions is consistent with the findings of LaMontagne et al. (2022) in Zimbabwe and Asiimwe (2023) in Uganda. The level of Vaccine acceptance is based on the socio-cultural frameworks, requiring culturally adapted communication to deal with resistance to HPV vaccine utilization.

4.2.3 Utilisation of HPV Vaccination and Strategies for Improvement

When vaccination usage was assessed, 68.65% of the sample showed awareness of the HPV vaccine. Healthcare providers were the most common source of information for these individuals (37.84%). This dependence on healthcare personnel is consistent with findings by Perkins et al. (2015) in China, but it differs from the Brazilian environment, where educational institutions drive promotion (Lima et al., 2018), revealing a lack in local school-based treatments. Parental support for the target population was high, with 74.0% supporting for immunization of girls aged 9 to 14. The key explanation given by 63.24% of these supporters was the children's pre-sexual state. This agreement on the optimal vaccination age is consistent with regional data from Malawi and Kenya (Kalua et al., 2015; Oyugi et al., 2019). In terms of delivery sites, respondents preferred health centres (40.0%) and community settings (38.5%). These preferences highlight the need of decentralized, adaptable vaccination methods, supporting the operational techniques proposed by Chirenje et al. (2014) and Mpelwa et al. (2017). Despite widespread support, particular misinformation continues to inhibit effective adoption. A significant proportion of respondents had incorrect views about the vaccine's physiological and behavioural effects: 21.6% linked it to infertility, 20.2% thought it became useless after sexual debut, and 18.9% claimed it encourages early sexual engagement. These identical misunderstandings have already been identified as key impediments in India and Malawi (Mittal et al., 2018; Kalua et al., 2015). Overcoming these established beliefs necessitates focused educational efforts. According to Lima et al. (2018), such efforts must tap into the trusted networks of local media and frontline healthcare personnel to offer evidence-based adjustments directly to parents.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The study examined parental knowledge and views regarding HPV vaccination for girls aged nine to fourteen years in Lusaka Urban. The data show that there is a moderate level of awareness about HPV and its link to cervical cancer. Most parents recognize that the infection is preventable and are aware of the dangers of having multiple sexual partners. Despite this core understanding, considerable information gaps persist. Qualitative studies emphasize that parental perspectives are confounded by safety concerns and cultural sensitivities regarding sexual health. Overcoming these limitations needs specialized education and communication tactics that respect local cultural settings. Expanding awareness initiatives, especially within schools, is required to address misunderstandings and promote vaccination uptake among parents and guardians in the region.

5.2 Recommendations

The Ministry of Health must increase information efforts concerning HPV vaccine thru community workshops, local media, and school health initiatives developed in partnership with the Ministry of Education. Healthcare professionals should conduct community workshops to deliver correct information and address vaccine hesitancy directly. The Ministry must also ensure that all health clinics provide accessible and inexpensive vaccination services, including strategic outreach campaigns for underprivileged groups. A tracking mechanism should be created to evaluate vaccine uptake and focus resources to areas with low coverage.

The General Nursing Council of Zambia should revise nursing education to include thorough HPV instruction. Undergraduate curricula must include clinical features of the vaccination as well as good risk communication strategies. Practicing nurses must complete continuous education on current vaccination standards. To assist nurses in dealing with varied socio-cultural ideas regarding reproductive health, cultural competence training must be integrated into both initial and continuing education. A supporting supervision system is required to ensure consistent and accurate information delivery during vaccination campaigns.

Future empirical investigations must address the limitations of the current study and expand the evidence base for HPV vaccination interventions. Longitudinal research is required to assess the sustained behavioral impacts of educational campaigns on vaccine uptake over time. Subsequent studies should investigate the influence of healthcare system variables, including infrastructure, institutional policies, and provider attitudes, on parental decision-making. Comparative research across diverse geographic regions in Zambia is necessary to identify regional disparities in knowledge and utilization, thereby informing localized public health strategies. Additionally, in-depth qualitative inquiries should be conducted to isolate the specific determinants of parental refusal, while program evaluation studies must measure the direct effectiveness of school-based and community-level interventions in improving vaccine acceptance.

The recommendation for future studies should address the limitations of this research. Longitudinal studies are recommended to measure the behavioral impacts of educational campaigns on vaccination uptake over long periods. Further research should examine healthcare system variables, such as infrastructure, institutional policies, and provider attitudes. Influence parents' decision-making. Researchers should also undertake comparative studies in other Zambian provinces to explore regional differences in vaccine knowledge and uptake. To determine the exact causes of vaccine refusal, targeted qualitative investigations are required. Rigorous program evaluations must also consider the real-world effects of school and community-based health efforts in order to understand whether techniques effectively increase acceptability.

Declaration of Interest

The authors declare that they do not have any known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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