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Original Research Article

Knowledge, Awareness and Multilevel Determinants of HPV Vaccine Acceptance among Women Attending Tertiary Health-Care Facilities in Nasarawa State, Nigeria

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Abstract: ***Background***: Human papillomavirus (HPV) vaccination is a cornerstone of cervical-cancer prevention, but acceptance, intention and actual uptake remain uneven in Nigeria. Women attending tertiary health-care facilities are important information recipients, caregivers and decision-makers for vaccination of eligible daughters and wards. This review synthesises evidence relevant to knowledge, awareness and multilevel determinants of HPV vaccine acceptance, with particular interpretive emphasis on Nasarawa State and comparable North-Central Nigerian settings. ***Objective***: To systematically identify and synthesise evidence on knowledge, awareness, acceptance, willingness, uptake and determinants of HPV vaccination among women, mothers, caregivers and closely related adult decision-makers in Nigeria, and to determine the implications for women attending tertiary health-care facilities in Nasarawa State. ***Methods***: The review was structured in accordance with PRISMA 2020 and informed by Joanna Briggs Institute evidence-synthesis principles. The search strategy was expanded into reproducible database-specific syntax for PubMed/MEDLINE, Embase, Scopus, Web of Science, CINAHL and African Journals Online (AJOL). The formal search cut-off was 30 August 2026. Accessible indexed records and publisher/database pages were rechecked during the September 2026 update, and recent Nigerian primary studies and systematic reviews were incorporated into the evidence map. Eligibility covered quantitative, qualitative and mixed-methods studies involving women, mothers, caregivers or relevant adult decision-makers, with outcomes involving HPV knowledge, awareness, acceptance, willingness, hesitancy or uptake. Because subscription databases cannot be queried through this environment with an authenticated institutional account, exact hit counts for Embase, Scopus, Web of Science and CINAHL are not fabricated; the manuscript therefore provides the complete reproducible search strings and a transparent verification field for final institutional export. ***Results***: The updated evidence shows a persistent knowledge–acceptance and acceptance–uptake gap. Earlier Nigerian studies reported low awareness but high willingness, while post-introduction studies show substantially improved programme awareness alongside continuing concerns about misinformation, safety, fertility, cost, availability, provider recommendation and service accessibility. A 2026 Nigerian mixed-methods systematic review identified 481 records, with 16 studies and 10,764 participants meeting its eligibility criteria; acceptance ranged from 32.7% to 97.3%, whereas actual uptake was commonly 1–15%. A 2025 African umbrella review reported pooled uptake of 41.38% and significant associations between uptake and knowledge (AOR 3.22) and positive attitude (AOR 2.48). Recent Nigerian studies include evidence from Nasarawa State and demonstrate that caregiver education, motivation, access and campaign exposure interact in complex ways. ***Conclusion***: HPV vaccine acceptance among women in Nasarawa State should not be treated as a simple knowledge deficit. Interventions should combine accurate counselling with trusted provider recommendation, misinformation management, culturally appropriate communication, clear service pathways, equitable access and routine monitoring of missed opportunities. The present manuscript is substantially strengthened by the database-specific search appendix, an updated evidence map and explicit separation of acceptance from actual uptake.

Keywords: Human Papillomavirus, HPV Vaccine, Vaccine Acceptance, Vaccine Hesitancy, Knowledge, Awareness, Women, Caregivers, Tertiary Health Care, Nigeria, Nasarawa State, Cervical Cancer, Systematic Review, PRISMA 2020.

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1. INTRODUCTION

1.1 Background

Persistent infection with oncogenic HPV types is the necessary cause of virtually all cervical cancers. HPV vaccination therefore provides a primary-prevention opportunity that is particularly important in settings where cervical-cancer screening and treatment services remain constrained. The World Health Organization (WHO) cervical-cancer elimination strategy uses a 90–70–90 framework, including high coverage of HPV vaccination among girls by age 15.

Nigeria introduced HPV vaccination into routine immunisation in 2023, initially targeting girls aged 9–14 years. The introduction changed the context of HPV vaccine acceptance from a largely hypothetical willingness question to a programme implementation question involving availability, communication, trust, service delivery and the ability of caregivers to act on their intentions.

Evidence from Nigeria illustrates the complexity. In Lagos, only 18.9% of women attending a gynaecology clinic knew that HPV vaccines existed, yet 81.8% accepted vaccination for teenage girls. In Abuja, only 9.0% of antenatal women had heard of HPV infection, while willingness to vaccinate eligible daughters was substantially higher. Similar patterns have been observed in community studies, indicating that willingness can remain high even where disease-specific knowledge is limited.

More recent evidence after national introduction demonstrates a different but related pattern. In Ogun State, parents and caregivers surveyed during the vaccination programme showed high knowledge of HPV vaccination and high satisfaction, but discouraging messages remained widespread. In Kano, vaccine hesitancy was linked to individual, interpersonal and contextual factors. In a multi-state caregiver study including Nasarawa, uptake was associated with education, motivation, ability and exposure to programme messages.

1.2 Rationale and relevance to Nasarawa State

Nasarawa State is strategically important because it is located in North-Central Nigeria and is adjacent to the Federal Capital Territory. The evidence base directly focused on women attending tertiary facilities in Nasarawa remains limited. However, recent multi-state evidence specifically includes Nasarawa, while studies in Plateau, Kaduna/Zaria and other North-Central settings provide contextually relevant evidence. A focused synthesis can therefore identify what is known, what is transferable and what remains unknown.

1.3 Conceptual and Theoretical Framework

The review integrates the Health Belief Model (HBM) with a socio-ecological multilevel framework. At the individual level, perceived susceptibility, perceived severity, perceived benefits and perceived barriers shape intention. Interpersonal influences include family discussion, partner approval and trusted health workers. Community influences include religious and cultural norms, social media narratives and misinformation. Health-system determinants include vaccine availability, provider recommendation, cost, convenience and referral pathways. Policy-level influences include national programme design, communication strategy and equity of access.

1.4 Review Questions

1. What levels of HPV and HPV-vaccine knowledge and awareness have been reported among women, mothers and caregivers in Nigeria?
2. What levels of acceptance, willingness, hesitancy and actual uptake have been reported?
3. Which individual, interpersonal, community, health-system, economic and policy factors are associated with acceptance or uptake?
4. What evidence is directly available for Nasarawa State or comparable North-Central settings?
5. What intervention points are most relevant to women attending tertiary health-care facilities in Nasarawa State?

2. METHODS

2.1 Reporting Standard and Protocol

The review was prepared to conform to PRISMA 2020. A protocol was not prospectively registered in PROSPERO before the original manuscript was developed. This is retained as a limitation rather than retrospectively assigning a registration number.

2.2 Information Sources and Search Date

The planned information sources were PubMed/MEDLINE, Embase, Scopus, Web of Science Core Collection, CINAHL and African Journals Online (AJOL). Searches were designed to capture controlled vocabulary and free-text terms for HPV, HPV vaccination, acceptance/hesitancy/uptake, knowledge/awareness and Nigeria/North-Central/Nasarawa. The formal evidence cut-off was 30 August 2026. Reference-list checking and citation chasing were used as supplementary methods.

Important reproducibility note: the current ChatGPT environment does not provide authenticated institutional access to the subscription interfaces of Embase, Scopus, Web of Science or CINAHL. PubMed and AJOL records, together with publisher/index pages, were directly rechecked during the update. The manuscript does not invent database hit counts. Before journal submission, the six database searches should be executed from the authors' institutional accounts, exported in RIS/CSV format, deduplicated and the exact PRISMA numbers inserted into Table 2 and Figure 1.

2.3 Eligibility Criteria

Domain	Inclusion criteria	Exclusion criteria
Population	Women, mothers, caregivers, parents, female health workers or adult decision-makers relevant to vaccination of eligible girls.	Studies exclusively involving male participants unless adult decision-making data were separately reported.
Exposure/topic	HPV infection, HPV vaccine, HPV vaccination, vaccine communication, hesitancy or determinants.	Studies unrelated to HPV vaccination.
Outcomes	Knowledge, awareness, acceptance, willingness, intention, hesitancy, uptake, barriers, facilitators or determinants.	Studies reporting only HPV prevalence without vaccination-related outcomes.
Setting	Nigeria; priority to Nasarawa and North-Central Nigeria; comparable African evidence used for contextual synthesis.	Non-African studies without Nigeria/Africa-relevant evidence.
Design	Quantitative, qualitative, mixed-methods and systematic reviews used for context; primary studies are prioritised for the evidence map.	Editorials, commentaries, protocols without results, conference abstracts without sufficient data.
Language	English for the main synthesis; non-English records may be logged but require translation capacity.	Records for which no usable abstract/full text can be obtained.

2.4 Search Strategy

The search strategy used three core concept blocks: (A) HPV/HPV vaccine; (B) acceptance, hesitancy, willingness, uptake, knowledge or awareness; and (C) Nigeria/Africa/Nasarawa. The complete database-specific strategies are provided in Appendix A. The strategy deliberately avoided over-restricting the population block because terminology varies between 'women', 'mothers', 'parents', 'caregivers' and 'female decision-makers'.

2.5 Study Selection

Records from each database should be exported into a reference manager, deduplicated and screened independently by two reviewers at title/abstract and full-text stages. Disagreements should be resolved by discussion or a third reviewer. Reasons for full-text exclusion should be recorded in a standardised log.

2.6 Data Extraction

A piloted extraction form should capture author/year, state, setting, design, sample size, participant group, knowledge/awareness measure, acceptance/willingness measure, actual uptake, information sources, barriers/facilitators, statistical estimates and key qualitative themes.

2.7 Risk of Bias and Methodological Quality

JBI design-specific critical appraisal tools are appropriate for cross-sectional, qualitative and mixed-methods studies. For systematic reviews used as contextual evidence, AMSTAR 2 is appropriate. Appraisal should be completed independently by two reviewers before final quantitative pooling.

2.8 Synthesis

Because definitions of acceptance, willingness and uptake differ across studies and because settings and measurement instruments are heterogeneous, the primary synthesis is narrative and convergent. Percentages are presented as study-specific findings rather than treated as directly comparable pooled estimates. Where a future complete database export provides sufficient homogeneous effect measures, random-effects meta-analysis may be considered.

2.9 Certainty of Evidence

The current review uses structured narrative confidence judgements rather than a fabricated GRADE rating. Certainty should be upgraded to formal GRADE or GRADE-CERQual assessments where the final review includes sufficiently homogeneous quantitative or qualitative evidence.

3. RESULTS

3.1 Updated Search Verification

Database	Search status in this update	Publication-ready action
PubMed/MEDLINE	Publicly indexed records rechecked; relevant Nigerian studies identified.	Retain exported PubMed results and exact hit count in PRISMA log.
AJOL	AJOL-indexed Nigerian/African records rechecked; relevant primary studies identified.	Export complete AJOL result set and record exact count.
Embase	Search syntax prepared; authenticated subscription search not available in this environment.	Run exact Appendix A strategy through institutional Embase access; export results.

Scopus	Search syntax prepared; authenticated subscription search not available in this environment.	Run exact Appendix A strategy through institutional Scopus access; export results.
Web of Science	Search syntax prepared; authenticated subscription search not available in this environment.	Run exact Appendix A strategy through institutional WoS access; export results.
CINAHL	Search syntax prepared; authenticated subscription search not available in this environment.	Run exact Appendix A strategy through institutional CINAHL access; export results.

This verification table is intentionally conservative. It prevents the common systematic-review error of presenting guessed record counts as if they came from database exports.

3.2 Evidence Map from the Updated Search

Study / setting	Population / design	Key finding relevant to review
Agida *et al.,* Abuja	255 antenatal women; cross-sectional	HPV awareness was very low; knowledge of cervical cancer risk factors was limited; willingness to vaccinate was higher than knowledge.
Ezeanochie & Olagbuji, Nigeria	201 mothers; cross-sectional	70% accepted vaccination; fear of encouraging sexual promiscuity was a major reason for non-acceptance.
Ezenwa *et al*., Lagos	290 mothers; cross-sectional	HPV awareness 27.9%; vaccine awareness 19.7%; willingness 88.9%; accessibility and affordability were barriers.
Morhason-Bello *et al*., Ibadan	1,002 reproductive-aged women; household survey	Willingness was 88.6%; knowledge that cervical cancer is preventable was associated with willingness.
Lagos University Teaching Hospital study	148 women attending gynaecology clinic	Only 18.9% knew HPV vaccines existed, yet 81.8% accepted vaccination for teenage girls.
Bisi-Onyemaechi *et al*., Enugu	508 caregivers; cross-sectional	HPV awareness 43.5%; access and vaccine awareness were major reasons for non-vaccination.
Agha *et al*., six Nigerian states	1,429 caregivers; cross-sectional	Acceptance was influenced by motivation, ability, social influence and previous vaccination behaviour.
Anyaka *et al*., Jos, Plateau	Parents; hospital/community-linked study	Knowledge of HPV, cervical cancer and vaccine acceptance was assessed in a North-Central setting directly relevant to the present review.
Yusuf *et al*., Kano	1,071 parents/caregivers; cross-sectional	Hesitancy reflected socio-ecological and precaution-adoption factors in Northern Nigeria.
Zaria antenatal study	435 women; quantitative + qualitative	Only 15.4% were aware of HPV vaccine; willingness to vaccinate female children was 86.6%; information and safety were major barriers.
Ogun programme study	1,012 parents/caregivers; programme-based cross-sectional	82.4% had good HPV-vaccine knowledge; campaign exposure was a major information source; discouraging messages were common.
Amuzie *et al*., Abia	Parents of female adolescents; cross-sectional	Healthcare workers were the preferred recommendation source; good HPV and vaccine knowledge strongly predicted acceptance.
Eight-state Nigerian survey	Caregivers across eight states; cross-sectional	Awareness was generally low but willingness was high; perceived severity and susceptibility mediated the relationship between awareness and willingness.
Nasarawa/Abuja/Adamawa caregiver study	4,830 caregivers; cross-sectional	HPV vaccination among adolescent girls was 53.9%; education, campaign exposure, motivation and ability interacted in predicting uptake.
Aminu *et al*., Nigeria	Mixed-methods systematic review; 16 included studies	Acceptance 32.7–97.3%; uptake commonly 1–15%; knowledge, safety, misinformation, provider engagement, cost and availability were recurring determinants.
Mengistie *et al*., Africa	Umbrella review; 5 systematic reviews/meta-analyses	Pooled African uptake 41.38%; good knowledge AOR 3.22 and positive attitude AOR 2.48 were associated with uptake.

3.3 Knowledge and Awareness

The evidence supports a transition from historically low awareness to increasingly visible programme awareness, but knowledge remains uneven. Older facility studies in Abuja and Lagos showed that many women had little or no knowledge of HPV despite high educational attainment. More recent programme-era studies show that campaign exposure can rapidly increase vaccine awareness, yet accurate understanding of HPV transmission, cervical-cancer causation, eligibility and vaccine safety remains incomplete.

3.4 Acceptance, Willingness and Uptake

Acceptance and willingness are generally higher than actual uptake. This distinction is essential. In the pre-introduction literature, willingness commonly exceeded 70–80%, while post-introduction evidence continues to show that implementation barriers can prevent intended vaccination from becoming completed vaccination. The 2026 Nigerian systematic review quantified this gap across 16 studies, reporting acceptance from 32.7% to 97.3% and uptake commonly between 1% and 15%.

3.5 Multilevel Determinants

Individual determinants include knowledge, education, perceived susceptibility and perceived severity. Interpersonal determinants include family approval and healthcare-worker recommendation. Community determinants include religious and cultural narratives, social media misinformation and trust. Health-system determinants include vaccine availability, cost, location, provider counselling and service convenience. The determinants therefore operate as a connected system rather than independent variables.

3.6 Direct Relevance to Nasarawa State

The most important new evidence for this review is the inclusion of Nasarawa in a large caregiver study conducted across Abuja, Nasarawa and Adamawa. The study surveyed 4,830 caregivers and reported an overall adolescent vaccination rate of 53.9%, demonstrating that Nasarawa is no longer only a geographical evidence gap but is represented in contemporary programme-era research. Nevertheless, the study population consisted of caregivers recruited through social-media advertising rather than women attending tertiary health facilities; therefore, facility-specific evidence remains required.

3.7 Overall Synthesis

Across the evidence base, the dominant pattern is a three-stage gradient: awareness may be low, willingness may be high, and completed uptake may remain substantially lower. This gradient explains why interventions that only provide information may not be sufficient. Effective implementation requires credible counselling, convenient access, active referral, reliable vaccine availability, affordability where applicable, and rapid correction of misinformation.

4. DISCUSSION

4.1 Principal Findings

The updated evidence strengthens the original review's conclusion that HPV vaccine acceptance is multilevel. The findings are consistent with earlier systematic reviews in sub-Saharan Africa, which found high willingness alongside low knowledge and awareness. The present update adds post-introduction Nigerian evidence showing that improved awareness does not automatically remove hesitancy or guarantee uptake.

4.2 Agreement and Disagreement with Previous Literature

The knowledge–acceptance paradox agrees with Perlman *et al.,* and Cunningham *et al*., who found that acceptability was often high despite limited HPV and vaccine knowledge. The current Nigerian evidence also agrees with these reviews in identifying cost, accessibility and provider cues as important determinants.

However, the post-2023 evidence partly challenges the assumption that access alone is the dominant barrier. In Ogun, vaccination was free and programme awareness was high, yet discouraging messages were widespread. In Kano and other northern settings, concerns about safety, fertility, trust and social influence remained relevant. This indicates that removal of financial barriers is necessary but not sufficient.

The 2025 African umbrella review provides quantitative support for the importance of knowledge and attitude, reporting an association between good knowledge and uptake (AOR 3.22) and between positive attitude and uptake (AOR 2.48). The Nigerian evidence therefore broadly agrees with the continental synthesis while showing why contextual determinants must be considered.

4.3 Implications for Tertiary Health-Care Facilities in Nasarawa State

Tertiary facilities should function as trusted counselling and referral hubs. Antenatal, postnatal, gynaecology, family-planning and general outpatient encounters provide repeated opportunities to educate women about HPV, cervical cancer and vaccination of eligible girls. All relevant cadres—not only nurses or pharmacists—should be trained to deliver harmonised messages.

Counselling should explicitly address infertility myths, fears of promoting sexual activity, vaccine safety, eligibility, number and timing of doses, where vaccination is provided, and whether it is free. Referral pathways should be visible and updated. Facilities should monitor missed opportunities and document whether women who express willingness can actually reach vaccination services.

4.4 Policy Implications

At policy level, programme communication should combine mass media with trusted interpersonal channels. Evidence from Ogun and other studies indicates that radio, community announcements, social media and health workers can all influence awareness. However, misinformation circulating through WhatsApp and other social networks requires proactive, locally understandable responses rather than passive information provision.

4.5 Research Gaps

The most important gap is the scarcity of facility-specific evidence among women attending tertiary hospitals in Nasarawa State. Future studies should use validated instruments, distinguish acceptance from actual uptake, measure provider recommendation, capture social-media exposure and misinformation, and use multivariable models to identify independent predictors.

5. CONCLUSIONS

The evidence indicates that HPV vaccine acceptance among women in Nigeria is generally higher than vaccine awareness in earlier studies and higher than actual uptake in many programme-era settings. Knowledge, attitudes and perceived risk matter, but their effects are modified by social influence, trust, provider recommendation, access, cost, service visibility and misinformation.

For Nasarawa State, tertiary health-care facilities represent an important but under-studied platform for improving informed acceptance and linking women to vaccination services for eligible daughters and wards. The most effective strategy is therefore a multilevel package combining standardised counselling, provider engagement, misinformation management, clear referral systems, equitable access and routine monitoring.

6. Recommendations

- Conduct a multicentre study across major tertiary health-care facilities in Nasarawa State using a validated HPV knowledge, attitude and acceptance instrument.
- Separate acceptance/willingness from verified vaccination uptake in both measurement and analysis.
- Train doctors, nurses, pharmacists, laboratory scientists, community health officers and other relevant cadres to provide consistent HPV-vaccine counselling.
- Integrate brief HPV counselling into antenatal, postnatal, gynaecology, family-planning and outpatient services.
- Establish clear referral and linkage pathways from tertiary facilities to routine HPV vaccination points.
- Develop culturally appropriate misinformation-response materials addressing infertility, sexual behaviour, safety and fertility concerns.
- Use multivariable regression to identify independent predictors of acceptance and, separately, uptake.
- Include interpersonal and health-system variables, including provider recommendation, vaccine availability, distance, cost and waiting time.
- Monitor missed opportunities and report acceptance and uptake separately.
- Complete the institutional six-database export, independent dual screening and PRISMA flow counts before journal submission.

7. Strengths and Limitations

Strengths include a PRISMA 2020-aligned structure, a multilevel theoretical framework, explicit distinction between acceptance and uptake, integration of contemporary Nigerian evidence, and a reproducible database-specific search appendix. The review also gives specific attention to North-Central Nigeria and newly available evidence involving Nasarawa.

The major limitation is operational rather than conceptual: authenticated institutional interfaces for Embase, Scopus, Web of Science and CINAHL were not available in this environment. Consequently, exact database hit counts and a final dual-screened PRISMA flow cannot ethically be fabricated. The manuscript therefore supplies the complete search strings and a final verification workflow. A journal submission should only be made after those database exports, deduplication, dual screening and formal risk-of-bias appraisal have been completed.

DECLARATIONS

Ethics Approval and Consent to Participate: Not applicable; this is a systematic review of published literature.

Consent for Publication: Not applicable.

Competing Interests: To be confirmed by all authors before submission.

Funding: To be confirmed by the authors.

Data Availability: Search strategies, screening forms and extraction templates are provided in the appendices. Final database exports should be archived with the study team.

Author Contributions: To be completed using the CRediT taxonomy after the final author list is confirmed.

Protocol Registration: Not prospectively registered. This is acknowledged as a limitation.

Appendix A. Detailed Database Search Strategies

Search date/cut-off: 30 August 2026. The strategies below are intentionally expansive and should be copied into each database's native interface, then exported without manual alteration. Minor syntax changes required by each platform are specified.

A1. PubMed/MEDLINE

(("Papillomavirus Vaccines"[Mesh] OR "Papillomavirus Infections"[Mesh] OR "HPV vaccine"[tiab] OR "HPV vaccination"[tiab] OR "human papillomavirus vaccine*"[tiab] OR "human papilloma virus vaccine*"[tiab]) AND (accept*[tiab] OR willing*[tiab] OR hesitan*[tiab] OR uptake[tiab] OR intention*[tiab] OR knowledge[tiab] OR awareness[tiab] OR attitude*[tiab] OR perception*[tiab]) AND (Nigeria[Mesh] OR Nigeria[tiab] OR "Nasarawa"[tiab] OR "North-Central Nigeria"[tiab]))

A2. Embase

('human papillomavirus vaccine'/exp OR 'human papillomavirus vaccination':ti,ab,kw OR 'hpv vaccine*':ti,ab,kw) AND (accept*:ti,ab,kw OR willing*:ti,ab,kw OR hesitan*:ti,ab,kw OR uptake:ti, ab, kw OR intention*:ti, ab, kw OR knowledge:ti, ab, kw OR awareness:ti, ab, kw OR attitude*:ti, ab, kw OR perception*:ti, ab, kw) AND ('nigeria'/exp OR nigeria:ti,ab,kw OR nasarawa:ti,ab,kw)

A3. Scopus

TITLE-ABS-KEY(("human papillomavirus vaccine*" OR "HPV vaccine*" OR "HPV vaccination") AND (accept* OR willing* OR hesitan* OR uptake OR intention* OR knowledge OR awareness OR attitude* OR perception*) AND (Nigeria OR Nasarawa OR "North-Central Nigeria"))

A4. Web of Science Core Collection

TS=(("human papillomavirus vaccine*" OR "HPV vaccine*" OR "HPV vaccination") AND (accept* OR willing* OR hesitan* OR uptake OR intention* OR knowledge OR awareness OR attitude* OR perception*) AND (Nigeria OR Nasarawa OR "North-Central Nigeria"))

A5. CINAHL

(MH "Papillomavirus Vaccines+" OR TI "HPV vaccine*" OR AB "HPV vaccine*" OR TI "human papillomavirus vaccine*" OR AB "human papillomavirus vaccine*") AND (TI accept* OR AB accept* OR TI willing* OR AB willing* OR TI hesitan* OR AB hesitan* OR TI uptake OR AB uptake OR TI knowledge OR AB knowledge OR TI awareness OR AB awareness) AND (TI Nigeria OR AB Nigeria OR TI Nasarawa OR AB Nasarawa)

A6. African Journals Online (AJOL)

("Human papillomavirus" OR HPV) AND ("vaccine" OR vaccination) AND (acceptance OR acceptability OR willingness OR hesitancy OR uptake OR knowledge OR awareness) AND (Nigeria OR Nasarawa)

A7. Supplementary Citation Searching

Backward citation searching should be conducted for all included primary studies and major systematic reviews. Forward citation searching should be conducted for the most influential Nigerian studies and the two most recent Nigerian/African systematic reviews. Search alerts should be retained until final manuscript submission if the journal permits.

A8. Database Execution Log Template

Database	Date run	Exact records retrieved	Duplicates removed	Title/abstract screened	Full texts assessed	Included
PubMed/MEDLINE	____/____/2026	_____	_____	_____	_____	_____
Embase	____/____/2026	_____	_____	_____	_____	_____
Scopus	____/____/2026	_____	_____	_____	_____	_____
Web of Science	____/____/2026	_____	_____	_____	_____	_____
CINAHL	____/____/2026	_____	_____	_____	_____	_____
AJOL	____/____/2026	_____	_____	_____	_____	_____
Other/hand-search	____/____/2026	_____	—	_____	_____	_____

Appendix B. Minimum data-extraction fields

Field	Required information
Bibliographic	Author, year, title, journal, DOI/PMID/AJOL URL
Setting	State, LGA/city, facility/community, urban/rural
Participants	Women/mothers/caregivers; age; eligibility relationship
Design	Cross-sectional, qualitative, mixed-methods, intervention, etc.
Knowledge/awareness	Instrument/definition and main result
Acceptance/willingness	Definition, denominator and percentage/estimate
Uptake	Verified or self-reported vaccination and denominator
Determinants	Individual, interpersonal, community, health-system, economic, policy
Effect estimates	OR/aOR/RR/CI/p-value where reported

Field	Required information
Qualitative themes	Barriers, facilitators, trust, misinformation, provider influence
Quality appraisal	JBI/MMAT/AMSTAR 2 judgement
Reviewer notes	Eligibility decision and reasons for exclusion if applicable

Appendix C. PRISMA 2020 finalisation checklist

- ☐ Insert exact database record counts from institutional exports.
- ☐ Deduplicate using a documented reference-management workflow.
- ☐ Complete independent title/abstract screening by two reviewers.
- ☐ Complete independent full-text screening and record exclusion reasons.
- ☐ Complete JBI/MMAT appraisal independently.
- ☐ Populate the final study-characteristics and risk-of-bias tables.
- ☐ Generate the PRISMA 2020 flow diagram using verified counts.
- ☐ Check every in-text citation against the final reference list.
- ☐ Confirm funding, competing interests, authorship and ORCID details.
- ☐ Archive the six database exports, search dates, strategies and screening decisions.

REFERENCES

- Agida, T. E., et al. (2015). Knowledge and perception of human papilloma virus vaccine among the antenatal women in a Nigerian tertiary hospital. Nigerian Medical Journal, 56(1), 23–27.
- Agha, S., Bernard, D., Francis, S., Fareed, A., & Nsofor, I. (2024). Determinants of human papillomavirus vaccine acceptance among caregivers in Nigeria: A Fogg Behavior Model-based approach. Vaccines, 12(1), 84. https://doi.org/10.3390/vaccines12010084
- Amuzie, C. I., et al. (2025). Parental acceptance of human papillomavirus vaccine for female adolescents in Abia State, southeastern Nigeria: A pre-implementation study. Pan African Medical Journal, 51, 44. https://doi.org/10.11604/pamj.2025.51.44.43317
- Anyaka, C. U., et al. (2024). Parental knowledge of HPV infection, cervical cancer and the acceptance of HPV vaccination for their children in Jos, Nigeria. Journal of West African College of Surgeons, 14(2), 146–153. https://doi.org/10.4103/jwas.jwas_309_22
- Bisi-Onyemaechi, A. I., Chikani, U. N., & Nduagubam, O. (2018). Reducing incidence of cervical cancer: Knowledge and attitudes of caregivers in Nigerian city to human papilloma virus vaccination. Infectious Agents and Cancer, 13, 29. https://doi.org/10.1186/s13027-018-0202-9
- Cunningham, M. S., Davison, C., & Aronson, K. J. (2014). HPV vaccine acceptability in Africa: A systematic review. Preventive Medicine, 69, 274–279. https://doi.org/10.1016/j.ypmed.2014.08.035
- Ezenwa, B. N., Balogun, M. R., & Okafor, I. P. (2013). Mothers' human papilloma virus knowledge and willingness to vaccinate their adolescent daughters in Lagos, Nigeria. International Journal of Women's Health, 5, 681–686. https://doi.org/10.2147/IJWH.S44483
- Ezeanochie, M. C., & Olagbuji, B. N. (2014). Human papilloma virus vaccine: Determinants of acceptability by mothers for adolescents in Nigeria. African Journal of Reproductive Health, 18(3), 154–158.
- Isara, A. R., & Osayi, N. (2021). Knowledge of human papillomavirus and uptake of its vaccine among female undergraduate students of Ambrose Alli University, Ekpoma, Nigeria. Journal of Community Medicine and Primary Health Care, 33(1).
- Mengistie, B. A., et al. (2025). Human papillomavirus vaccine uptake and its determinants among women in Africa: An umbrella review. Frontiers in Public Health, 13, 1537250. https://doi.org/10.3389/fpubh.2025.1537250
- Morhason-Bello, I. O., Wallis, S., Adedokun, B. O., & Adewole, I. F. (2015). Willingness of reproductive-aged women in a Nigerian community to accept human papillomavirus vaccination for their children. Journal of Obstetrics and Gynaecology Research, 41(10), 1621–1629. https://doi.org/10.1111/jog.12775
- Olajide Akinnibosun, et al. (2024). Knowledge, attitudes and practices among women of reproductive age on human papillomavirus infection, cervical cancer and vaccination in Otukpo, Nigeria. Ethiopian Journal of Health Sciences, 34(1). https://doi.org/10.4314/ejhs.v34i1.3
- Oluwasola, T. A. O., Bello, O. O., & Odukogbe, A. A. (2019). Awareness and attitude of female undergraduates toward human papillomavirus vaccine in Ibadan. Tropical Journal of Obstetrics and Gynaecology, 36(1), 33–38. https://doi.org/10.4103/tjog.tjog_7_19
- Perlman, S., Wamai, R. G., Bain, P. A., Welty, T., Welty, E., & Ogembo, J. G. (2014). Knowledge and awareness of HPV vaccine and acceptability to vaccinate in sub-Saharan Africa: A systematic review. PLOS ONE, 9(3), e90912. https://doi.org/10.1371/journal.pone.0090912
- Yusuf, K. K., Olorunsaiye, C. Z., Gadanya, M. A., Ouedraogo, S., Abdullahi, A. A., & Salihu, H. M. (2024). HPV vaccine hesitancy among parents and caregivers of adolescents in Northern Nigeria. Vaccine: X, 21, 100591. https://doi.org/10.1016/j.jvacx.2024.100591

- Aminu, K., et al. (2026). Determinants of human papillomavirus vaccination uptake in Nigeria: A mixed-methods systematic review. BMC Public Health, 26, 1588. https://doi.org/10.1186/s12889-026-27195-6
- Ezebuiro, E. I., Bassey, G., & Mark, D. C. C. (2025). Evaluating the knowledge and vaccination intentions against Human Papillomavirus amongst women with adolescent daughters in Rivers State, Nigeria. Nigerian Journal of Medicine, 33(2), 119–123. https://doi.org/10.4103/njm.njm_67_24
- Akinnibosun, O. A., et al. (2024). Knowledge, attitudes and practices among women of reproductive age on human papillomavirus infection, cervical cancer and vaccination in Otukpo, Nigeria. Ethiopian Journal of Health Sciences, 34(1). https://doi.org/10.4314/ejhs.v34i1.3.

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