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Human papillomavirus self-sampling for cervical cancer screening among women in sub-Saharan Africa: a scoping review protocol

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ABSTRACT

Introduction Evidence shows that women in sub-Saharan Africa have high rates of cervical cancer (CC) mortality compared with women in high-income countries. Effective screening programmes have significantly reduced the burden of CC in high-income countries. Self-sampling for human papillomavirus testing (HPVSS) has been reported to increase the participation and engagement of women in CC screening. Before HPVSS can be introduced for CC screening there is a need to establish its acceptability among end-users to ensure the increase in CC screening rates. Here, we outline a protocol for a scoping review aimed at mapping literature on the use and acceptability of HPVSS for screening CC in sub-Saharan Africa to reveal gaps to guide future research and practice.

Method The scoping review protocol was developed according to Arksey and O'Malley and Levac *et al*, and guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews. We will search Scopus, PubMed, Medline Ovid, Cochrane and Web of Science databases for evidence on the use and acceptability of HPVSS published between January 2011 and July 2021. We will also search grey literature in the form of dissertations/theses, conference proceedings, websites of international organisations such as the WHO, and relevant government reports reporting evidence on HPVSS programmes for screening CC among women in sub-Saharan Africa.

Ethics and dissemination No ethical approval is needed for the study as it will not include animals or human participants. The results of the proposed scoping review will be disseminated electronically in peer-reviewed journals, in print and through conference presentations.

Strengths and limitations of this study

- The results of this review will establish a baseline understanding of the use and acceptability of human papillomavirus testing for cervical cancer screening in sub-Saharan Africa and expose gaps that exist.
- Here, we propose the use of an established scoping review methodology with a comprehensive search strategy that includes grey literature.
- The study will conduct a formal quality assessment of included studies guided by an established mixed-methods appraisal tool.
- A limitation of the review is the potential to miss relevant articles given that review articles will not be considered for the study.

INTRODUCTION

Despite being a largely preventable disease, cervical cancer (CC) incidence and mortality remain important indicators of global health inequality.[1] An estimated 90% of the globally recorded CC-related deaths are in low-income and middle-income countries (LMICs), of which 8 out of 10 are recorded within the sub-Saharan African (SSA) region.[2] In addition, the high burden of HIV/AIDS further worsens the problem of CC in SSA.[3 4] CC screening has significantly reduced the burden of CC in high-income countries.[3 5] However, in LMICs, the burden of CC incidence and mortality is very high due to the lack of organised CC screening services and low uptake of available screening services by women.[6–8] In 2018, the WHO made a global call for the elimination of CC by end of the century.[9] Under the call, the WHO targets to screen 70% of women with a high-performance test by 35, and again by 45 years of age by 2030.[9] The WHO has recommended the use of a high-performance test like human papillomavirus (HPV) DNA test for the screening of CC in women[10] and recent WHO guidelines now advocate for the use of self-sampling to screen CC among women.[11]

Self-sampling for HPV testing (HPVSS) is a process where a woman who wants to know whether she has a high-risk HPV infection uses a kit to collect a cervicovaginal sample from herself.[12–14] HPVSS has been shown to increase the participation of women in CC screening programmes by reducing individual and health system-related barriers to

screening particularly in low-resource settings.[12 14] The lack of privacy, fear and shame of a pelvic examination, and long distances to health facilities have been cited as barriers to CC screening.[8 12] Important considerations for introducing HPVSS should consider the follow-up of women who screen positive for HPV as well as triage options with another method such as visual inspection with acetic acid to prevent overtreatment of HPV infections which in most cases are transient.[12 13] Before HPVSS can be incorporated into national screening programmes there is a need to determine its acceptability among the targeted end-users.

Findings from a systematic review by Tesfahunei *et al* revealed the effectiveness of HPVSS to increase CC screening uptake by women in SSA compared with standard clinician sampling.[15] However, the systematic review only considered randomised control trials and hence perceptions and experiences of women could not be explored. There is a need to map existing evidence on the acceptability of HPVSS by synthesising both quantitative and qualitative data as well as studies that employ a mixed-methods approach.

The purpose of this scoping review is to map the literature evidence on the use and acceptability of HPVSS for CC screening in SSA by synthesising data from quantitative and qualitative studies. It is anticipated that findings from this study will enable the researchers to identify research gaps and guide future research towards improved and increased participation of women in CC screening programmes. The results of this study will also guide policymakers in designing CC screening programmes based on HPVSS that are more acceptable to end-users to increase the uptake of CC screening services in SSA.

METHODS AND ANALYSIS

This proposed scoping review is part of a multiphase Ph.D. study investigating the use and acceptability of HPVSS for CC screening among women in SSA. The review will be developed according to the methodological framework proposed by Arksey and O'Malley[16] and Levac *et al*,[17] and guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension (PRISMA) for Scoping Reviews .[18] According to Arksey and O'Malley framework,[16 17] a scoping review follows five stages: (1) identify the research question, (2) identify relevant studies, (3) select eligible studies, (4) charting the data and (5) collating, summarising and reporting the results. Arksey and O'Malley also proposed an optional sixth stage, the consultation with key stakeholders to provide insights beyond those found in the literature. This scoping review will not include consultation with stakeholders.

Eligibility of the research question for a scoping review

The research question is: What is the evidence on the use and acceptability of HPVSS for CC screening of women in SSA?

Table 1 PCC for determining the eligibility of the research question.

Population	Asymptomatic females; 25 years and older residing in SSA
Concept	HPVSS programmes conducted between January 2011 and June 2021
Context	Countries in the SSA region

HPVSS, self-sampling for Human papillomavirus testing; SSA, sub-Saharan Africa.

The main objective is: To map out evidence on the use and acceptability of HPVSS for CC screening of women in SSA.

We used the following elements: (population, concept and context) to conceptualise the review question as depicted in table 1.

Identification of relevant studies

We will conduct a comprehensive search of relevant literature from the following electronic databases for articles published between January 2011 and June 2021: Scopus, PubMed, Medline Ovid, Cochrane and Web of Science databases. We will search for randomised controlled trials, non-randomised controlled trials and observational studies that reported evidence on HPVSS for CC screening. Review articles (narrative, scoping, systematic, meta-analysis and meta-synthesis) will be excluded. In addition, we will search for grey literature from university dissertations and theses from institutional repositories, government and international organisations' reports such as the WHO. We will identify additional relevant studies by manually searching all references cited in the included studies to identify studies that have not been indexed by the electronic databases. The authors of the included articles will be contacted for missing data and review articles will not be included in this study.

The comprehensive search strategy will be co-developed by the principal investigator (PI), subject specialist and university librarian to ensure the correct use of indexing terminology and Medical Subject Headings (MeSH) terms. The following keywords or MeSH terms will be used: (1) 'cervical cancer', (2) 'human papillomavirus,' (3) 'self-sampling' and (4) 'sub-Saharan Africa'. Keywords may be refined to suit each database. Each search will be documented in detail showing the keywords/MeSH terms, date of search, electronic database and the number of retrieved studies. We piloted the search strategy on all the electronic databases and the results of the search are presented in online supplemental file 1.

Selection of eligible studies

Relevant studies will be selected using the following criteria:

Inclusion criteria

- Articles reporting on evidence of HPVSS in women 25 years and older.

- Articles reporting on the acceptability of HPVSS for CC screening.
- Articles reporting on evidence of HPVSS in women residing in SSA.
- Articles published between January 2011 and June 2021.

Exclusion criteria

Articles will be excluded from the scoping review if they have the following characteristics:

- Articles that report on other methods of CC screening
- Articles that do not report on acceptability, willingness, or preferences for HPVSS
- Articles reporting on evidence of HPVSS in women residing outside SSA.
- Articles published before January 2011 and after June 2021.
- Review articles.

All eligible articles will be exported to an Endnote 20 library and duplicates will be removed. The articles will be screened in three stages, namely title, abstract and full article screening. The PI will screen titles and abstracts in parallel with the co-reviewer. After screening titles and abstracts, the reviewers will discuss any discrepancies in selected articles until a consensus is reached. Two independent reviewers will then screen the full texts of articles selected during the first stage. A third screener will resolve any discrepancies in selected articles after the full-text screening. Both abstract and full article screening will be guided by the above inclusion/exclusion criteria.

The level of agreement between screeners' results after screening abstracts and full articles will be determined by calculating Cohen's kappa statistic. The kappa statistic will be interpreted as follows: values <0.1 indicate no agreement and 0.10–0.20 indicate none to slight, 0.21–0.40 as fair, 0.41–0.60 as moderate, 0.61–0.80 as substantial and 0.81–1.00 as almost perfect agreement. We will report the screening results following the PRISMA guidelines[19] (figure 1).

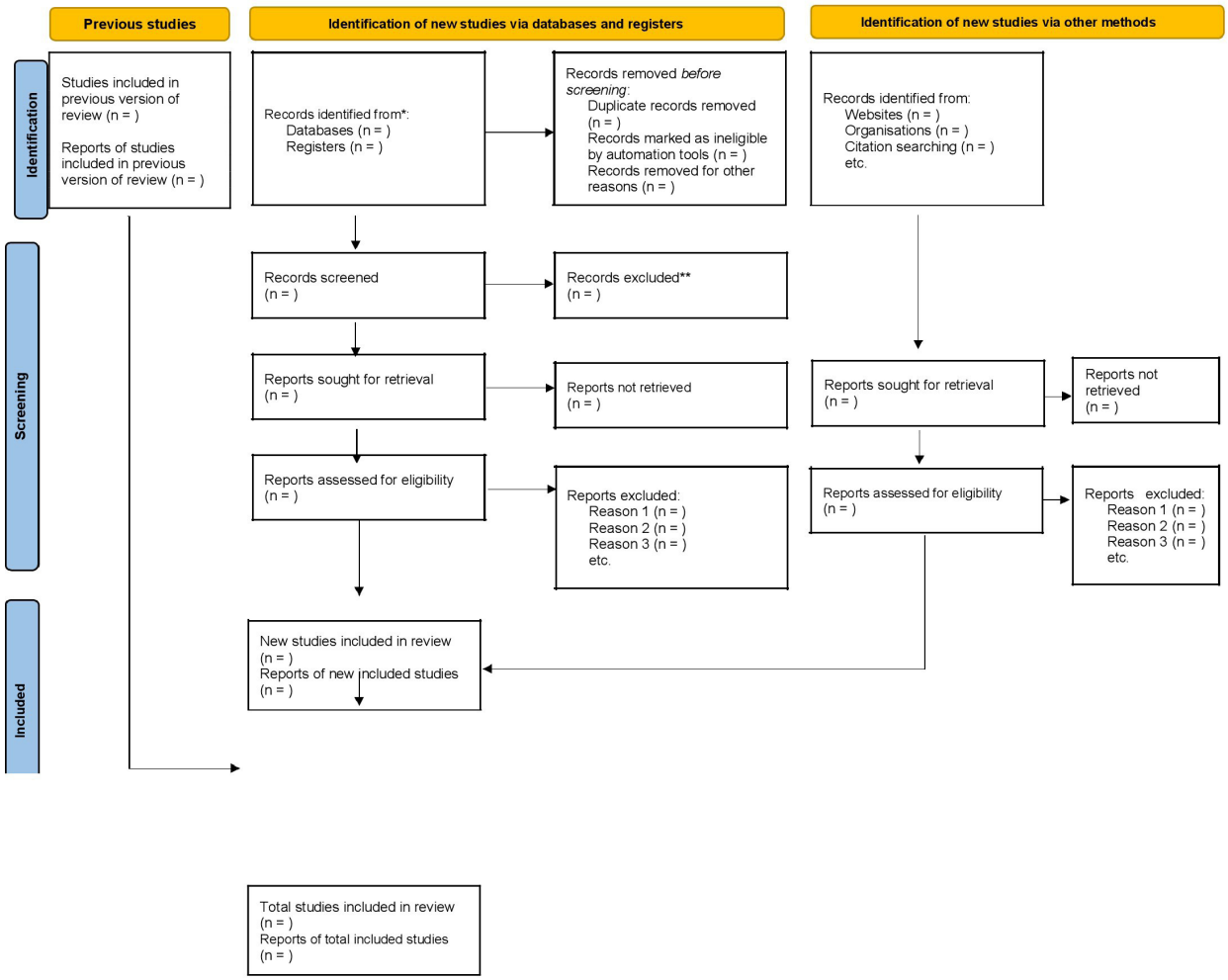

Figure 1 PRISMA flow diagram of the study selection process. PRISMA, Preferred Reporting Items for Systematic Reviews and Meta-Analyses.
*Consider, if feasible to do so, reporting the number of records identified from each database or register searched (rather than the total number across all databases/registers).
**If automation tools were used, indicate how many records were excluded by a human and how many were excluded by automation tools.

Box 1 Data charting form.

- Author and year of publication.
- Aim of study.
- Study population.
- Study setting (rural or urban).
- Geography (sub-Saharan Africa country where the study was conducted).
- Number of women (sample size).
- Age of women.
- Study design.
- Setting of self-sampling kits (health facility or home/community based).
- Type of self-sampling device used.
- Main findings (acceptability of human papillomavirus testing).
- Other significant findings.

Charting the data

We developed a data charting form to capture information from each relevant study. Two independent reviewers will pilot the data charting form before commencing with the scoping review. The data charting form will be modified based on the reviewers' feedback and it will constantly be updated throughout the scoping review. The form that will be used for data charting is presented in box 1.

Collating, summarising and reporting the results

We will employ NVivo V.12 to extract themes from the included studies.We will conduct a content thematic analysis of the included studies. We will present a narrative account of the findings presenting the main concepts from the included articles in line with our research question. Our study context is acceptability of self-sampling for HPV testing which is defined as the ease and comfort or willingness to perform cervicovaginal self-sampling[20]

Quality appraisal

We will use the mixed method appraisal tool version 2018 to evaluate the quality of the included studies.[21] Two independent reviewers will carry out the quality appraisal process. The following percentage scores will be used to grade the quality of evidence: (1)≤50% will represent low quality evidence, (2) 51%–75% will represent average quality evidence and (3) 76%–100% will represent high-quality evidence. This quality appraisal method will enable us to appraise a variety of study methods, that is, qualitative, quantitative or mixed-methods studies.[21]

Ethics and dissemination

No ethical approval is needed for the study because it will not include animals or human participants. The findings of this review will be disseminated electronically in peer-reviewed journals or print and presented at scientific conferences.

Patient and public involvement

In this protocol, there was no involvement of patients and the public.

DISCUSSION

The elimination of CC is in line with the 2030 agenda for sustainable development goal 3 (SDG 3) and targets that seek to ensure healthy lives and promote well-being for all at all ages.[22] The majority of women in LMICs including SSA lack access to CC screening services and where the services are available they are underutilised due to several barriers.[5] HPVSS has been demonstrated to increases the participation and engagement of under-screened and unscreened women in CC screening programmes.[23]There have been several HPVSS interventions that have been conducted in SSA, however, a few studies have synthesised evidence on the acceptability of the intervention.[24] The proposed scoping review will map evidence on the use and acceptability of HPVSS in SSA. Getting prior information on studies conducted in SSA will help guide the implementation of HPVSS for CC screening in the region and other LMICs. The scoping review is part of a larger study that seeks to pilot an HPVSS programme for CC screening in Zimbabwe. The scoping review will synthesise existing literature evidence and reveal gaps in research and guide the methodology of the main study. This intervention has the potential to increase access to underserved women as well as increase their participation in CC screening.

In this scoping review, we will include evidence on the use and acceptability of HPVSS for screening women aged 25 years and older, the WHO recommends HPV testing for women aged 30 years and above because most HPV infections in young women are transient.[10] We have chosen to include studies published in the last decade (2011–2021) to capture recent evidence on HPVSS in SSA. In addition, the WHO recommended the use of HPV testing for CC screening in 2013,[10] therefore, we are likely to find studies where HPVSS interventions have been implemented in SSA in response to the WHO recommendation. Furthermore, studies reporting evidence on other methods of CC screening other than HPVSS will not be considered for this review as well as studies conducted outside SSA. A limitation of the review is the potential to miss relevant articles given that review articles will not be considered for the study and also the potential to miss important studies from other LMICs outside SSA.

We have chosen to map evidence on HPVSS in SSA because it has the highest burden of CC in the world and findings are more likely to apply to Zimbabwe which is a country in SSA. We anticipate finding relevant studies reporting on the use and acceptability of HPVSS for screening CC in SSA. The findings of this review will help policy-makers to design interventions that increase the uptake of CC screening services in SSA. Furthermore, the findings will guide further research on best practices of implementing an acceptable HPVSS programme in LMICs.

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Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

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Supplementary File 1: Results of the search strategy for electronic databases and grey literature

Date of search	Electronic Database	Keywords/MeSH terms
14-06-2021	Web of Science	Human papillomavirus*" OR alphapapillomavirus OR hpv OR papillomavirus* OR "Cervical cancer*" OR "Uterine Cervical Neoplasm*" OR "cancer of the cervix" OR "uterine cervix tumor" AND "self-sampling" OR "self sampl*" OR "self collect*" OR "self screen*" OR screening AND Africa OR "sub-Saharan Africa" OR "Africa South of the Sahara" AND female OR woman OR women NOT algeria OR egypt OR libya OR morocco OR tunisia
06-07-2021	PubMed	((("Uterine Cervical Neoplasms"[Mesh] OR "Uterine Cervical Neoplasm*"[tw] OR "Cervical Cancer"[tw] AND (female[Filter])) OR ("Alphapapillomavirus"[Mesh] OR Alphapapillomavirus[tw] OR "Human papillomavirus*"[tw] OR HPV[tw] OR papillomavirus*[tw] AND (female[Filter]))) AND ("Self Administration"[Mesh] OR self-sampl*[tw] OR "self collect*"[tw] OR "self Administ*"[tw] OR "self screen*"[tw] AND (female[Filter]))) AND ("Africa South of the Sahara"[Mesh] OR "Africa Sub-Saharan"[tw] OR "Subsaharan Africa"[tw] OR "Sub-Sahara africa"[tw] AND (female[Filter])) Filters: in the last 10 years, Female
06-07-2021	Scopus	(TITLE-ABS-KEY(Africa* OR "sub-Saharan Africa" OR SS OR "Africa South of the Sahara" OR "Subsahara* Africa") AND TITLE-ABS-KEY("Human papillomavirus*" OR alphapapillomavirus OR hpv OR papillomavirus* OR "Cervical cancer*" OR "Uterine Cervical Neoplasm*" OR "cancer of the cervix" OR "uterine cervix tumor") AND TITLE-ABS-KEY("self-sampling" OR "self sampl*" OR "self collect*" OR "self screen*" OR screening) AND NOT TITLE-ABS-KEY(Algeria OR Egypt OR Libya OR Morocco OR Tunisia)) AND (LIMIT-TO (PUBYEAR,2021) OR LIMIT-TO (PUBYEAR,2020) OR LIMIT-TO (PUBYEAR,2019) OR LIMIT-TO (PUBYEAR,2018) OR LIMIT-TO (PUBYEAR,2017) OR LIMIT-TO (PUBYEAR,2016) OR LIMIT-TO (PUBYEAR,2015) OR LIMIT-TO (PUBYEAR,2014) OR LIMIT-TO (PUBYEAR,2013) OR LIMIT-TO (PUBYEAR,2012) OR LIMIT-TO (PUBYEAR,2011)) AND (LIMIT-TO (SRCTYPE,"j"))
12-07-2021	Ovid Medline	Ovid MEDLINE(R) <1996 to August Week 3 2021> 1 exp Uterine Cervical Neoplasms/ 48683 2 Uterine Cervical Neoplasms.af. 48719 3 Cervical Cancer.af. 37377 4 exp Alphapapillomavirus/ 8338 5 Alphapapillomavirus.af. 2733 6 exp Papillomavirus Infections/ 31367 7 Papillomavirus Infection*.af. 28075

		8 Human papillomavirus*.af. 33426 9 HPV.af. 35627 10 papillomavirus*.af. 42280 11 Cervi* Cancer.af. 38169 12 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 86646 13 exp Self Administration/ 8841 14 Self Administration.af. 11764 15 self-sampl*.af. 682 16 self collect*.af. 1155 17 self administrat*.af. 12471 18 self screen*.af. 205 19 self-testing.af. 1129 20 self-test*.af. 1491 21 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 15594 22 exp "Africa South of the Sahara"/ 168852 23 sub-sahara* Africa.af. 19913 24 22 or 23 173452 25 12 and 21 and 24 101 26 limit 25 to yr="2011 -Current" 95 27 limit 26 to (female and humans) 95
14-07-2021	Cochrane	ID Search Hits #1 MeSH descriptor: [Alphapapillomavirus] explode all trees 247 #2 MeSH descriptor: [Uterine Cervical Neoplasms] explode all trees 2171 #3 ("Uterine Cervical Neoplasm*" OR "Cervical Cancer" OR Alphapapillomavirus OR "Human papillomavirus*" OR HPV OR papillomavirus*) (Word variations have been searched) 7022 #4 #1 OR #2 OR #3 6989 #5 MeSH descriptor: [Self Administration] explode all trees 778 #6 (self-sampl* OR "self collect*" OR "self Administ*" OR "self screen*") (Word variations have been searched) 6495 #7 #5 OR #6 1040 #8 MeSH descriptor: [Africa South of the Sahara] explode all trees 6811 #9 ("sub-Saharan Africa") (Word variations have been searched) 2037 #10 #8 OR #9 8279 #11 #4 AND #7 AND #10 8 Date range 2011-2021 Results 7
31-08-21	Grey Literature identified through other sources	“Human papillomavirus” OR “cervical cancer” AND “self-sampling” AND “sub-Saharan Africa”