Sys Rev Pharm 2021; 12(9): 511-513
A multifaceted review journal in the field of pharmacy
E-ISSN 0976-2779 P-ISSN 0975-8453

Review Article

The Prevalence and Determinants of COVID-19 Vaccine Hesitancy in Sub-Saharan Africa: A Scoping Review Protocol

Celenkosini Thembelenkosini Nxumalo[1,2], Ebenezer Wiafe[3,4*], Varsha Bangalee[3]

[1]Department of Health, Ndwedwe Community Health Centre, Ndwedwe, South Africa
[2]Department of Nursing, University of KwaZulu-Natal, Durban, South Africa
[3]Department of Pharmaceutical Sciences, University of KwaZulu-Natal, Durban, South Africa
[4]Department of Clinical Pharmacy, Ho Teaching Hospital, Ghana, West Africa

Article History: *Submitted: 27.08.2021* *Accepted: 10.09.2021* *Published: 17.09.2021*

ABSTRACT

Purpose: Coronavirus disease (COVID-19) is a type of respiratory illness that has spread rapidly around the world contributing to high levels of mortality and morbidity which has subsequently led to poor quality of life. COVID-19 vaccines are presently a key biomedical preventive intervention in the present pandemic. Research on the uptake of COVID-19 vaccines suggests that COVID-19 vaccine hesitancy is a major threat to the success of this present intervention. This scoping review protocol is designed to guide the synthesis of evidence on the prevalence and determinants of COVID-19 vaccine hesitancy in sub-Saharan Africa.

Method: The methodological framework recommended by Arksey and O'Malley guided the development of the scoping review protocol. A comprehensive search of published and unpublished literature on the topic will be conducted through a search of electronic databases namely; PubMed, Google Scholar, CINAHL *via* EBSCO host, Sabinet, Cochrane library, and Web of Science. Extracted data will be analyzed thematically and presented as a narrative.

Conclusion: This scoping review will provide synthesized evidence on the prevalence and determinants of COVID-19 vaccine hesitancy in sub-Saharan Africa. The results of the review are anticipated to provide evidence to inform interventions to promote acceptability and uptake of COVID-19 vaccines in sub-Saharan Africa.

Keywords: COVID-19, Disease control, Global health, Health promotion, Immunity, Vaccine hesitancy

***Correspondence:** Ebenezer Wiafe, Department of Pharmaceutical Sciences, College of Health Sciences, University of KwaZulu-Natal, Durban, South Africa, and Department of Clinical Pharmacy, Ho Teaching Hospital, Ho, Ghana, E-mail: weben38@gmail.com

INTRODUCTION

Coronavirus disease (COVID-19) is a type of novel viral infection caused by SARS-CoV-2. The disease has spread rampantly across the world, resulting in large-scale morbidity and mortality across all affected regions (Sunil C, *et al.*, 2020). The pandemic has resulted in poor health outcomes in almost all regions affected due to the resultant morbidity and mortality. At present, the COVID-19 pandemic poses a major global public health concern due to the extent to which the virus has overwhelmed the health of individuals and healthcare resources (van Bavel JJ, *et al.*, 2020). The pandemic has also impacted economies, international relations, and political systems in many countries (Dodds K, *et al*, 2020). Presently the pandemic is at different stages in different regions of the world, being far from under control in most countries.

Data on the transmission of COVID-19 reveals that as of the 22 of June 2021, more than 177 million COVID-19 cases have been reported worldwide (WHO, 2021). Globally the mortality rate remains high, with more than 9000 deaths recorded every day in the aforementioned period (WHO, 2021). Recently a rapid rise in the number of new cases of infection has been noted in the African continent. Africa has to date recorded 3,968,421 cases of confirmed COVID-19 cases and more than 215,325 COVID-19 related deaths (WHO, 2021). Southern Africa, particularly South Africa is currently the epicenter of the COVID-19 pandemic in Africa with more than 1.5 million confirmed cases recorded since the beginning of the outbreak. Infection rates are further exacerbated by the occurrence of viral mutations resulting in new strains of the virus which have higher pathogenicity, infectiveness, and virulence. Due to the continuing significant impact of COVID-19 on all aspects of human life, there is an urgent need for a combination of behavioral and biomedical treatment interventions to stop the spread of infections. This will prevent the occurrence of new infections which perpetuates more viral mutations which further increases the burden of infections and complications associated with infection.

COVID-19 vaccines are presently one of the recommended biomedical treatment interventions (DeRoo SS, *et al.*, 2020). There is substantial evidence to support the promising nature of COVID-19 vaccines in safeguarding personal health, reducing mortality, and reversing the complications that the pandemic has had on vulnerable individuals and society (Lurie N, *et al.*, 2020; Calina D, *et al.*, 2020; Zhao J, *et al.*, 2020). The vaccines also provide the promise of normalizing social life and reopening the economy through protecting individuals from infection by attaining herd immunity. The success of the vaccines is however dependent upon the individual's acceptance and uptake. Data on the acceptability of COVID-19 vaccines implies that COVID-19 vaccine hesitancy may be a potential barrier to the success of its rollout and the potential benefits thereof (Dzieciolowska S, *et al.*, 2021; Sallam M, 2021). Research seems to suggest that this phenomenon is growing among individuals at various levels in society and thus necessitates urgent intervention because of the present nature of complications stemming from COVID-19. The literature reviewed suggests that COVID-19 vaccine hesitancy is complex and needs to be understood within the context within which it occurs at its manifestation is varies according to specific contextual factors (Sallam M, 2021).

In light of the recent trends in the number of new infections in sub-Saharan Africa and the nature of the region being predominantly low income, preventing the spread of COVID-19 is crucial to the livelihood of the region. Since vaccines provide the promise of a better tomorrow, the prevalence and determinates of COVID-19 vaccine hesitancy must be reviewed within the context of sub-Saharan Africa.

METHODOLOGY

This protocol would guide the conduct of a systematic scoping review on the prevalence and determinants of COVID-19 vaccine hesitancy in sub-Saharan Africa. This review approach was selected to highlight the evidence of the existence of COVID-19 vaccine hesitancy and the determinants thereof. The methodological framework by Arksey and O'Malley is the backbone of this protocol. The following steps will subsequently be followed during the conduct of the review-

(i) The identification of the review question

(ii) The identification of relevant studies

(iii) The selection of relevant studies

(iv) The charting of data from selected studies

(v) The collation, summarization, and the reporting of the review findings.

Identifying the research question

The main research question is: "What are the determinants of vaccine hesitancy in sub-Saharan Africa?"

The sub-research questions are-

1. What pieces of evidence exist on the determinants of COVID-19 vaccine hesitancy in sub-Saharan Africa?

2. What is the range of literature on the prevalence or scope of COVID-19 vaccine hesitancy in sub-Saharan Africa?

3. What evidence exists on the recommendations to address COVID-19 vaccine hesitancy in sub-Saharan Africa?

This review will use the PICO (Population, Interest phenomena, Context, Outcomes) framework to develop and apply a search strategy to relevant databases.

Identifying relevant studies

A search will be conducted for published and unpublished literature on the research topic. A comprehensive search of the following databases will be conducted: PubMed, Google Scholar, CINAHL*via* EBSCOhost, Sabinet, Cochrane library, and Web of Science.

A combination of relevant search terms will be done with Boolean operators. The keywords to be used are: "COVID-19 vaccine hesitancy" and "sub-Sharan Africa" or "COVID-19 vaccine acceptance" and "sub-Saharan Africa" or "hesitancy" and "COVID-19 vaccines" and "sub-Saharan Africa" or "acceptance" and "COVID-19 vaccines" and "sub-Saharan Africa". A snowball sampling approach will be used to retrieve references from studies that were included but not identified by the search. A hand search will also be done on websites such as the World Health Organisation (WHO) to identify potentially relevant literature. Relevant grey literature will also be obtained through a targeted search of dissertations and theses on relevant search engines such as ProQuest dissertations and Theses Global. Conference abstracts and proceedings will be searched from Citation Indexes.

Selection of eligible studies

Screening of titles and abstracts will be guided by the PICO framework (*Table 1*).The inclusion and exclusion criteria will ensure that the contents of all studies included are relevant to the research topic.

Table 1: PICO framework for eligibility of studies

Criteria	Determinants
Population	Individuals who are eligible for COVID-19 vaccination
Interest phenomena	Vaccine hesitancy
Context	Sub-Saharan Africa
Outcomes	Prevalence and determinants of COVID-19 vaccine hesitancy, and strategies that have successfully addressed COVID-19 vaccine hesitancy

Inclusion criteria

For studies to be included, they must meet the following inclusion criteria

- The focus must be on vaccine hesitancy concerning its scope
- Report on the determinants of vaccine hesitancy
- Reports, cases, and research findings must have links to sub-Saharan Africa.
- Quantitative and/or qualitative.
- Published anytime since the global outbreak of COVID-19 (November 2019).

Exclusion criteria

Studies will be excluded from the review based on the following

- Studies that focused on COVID-19 vaccine hesitancy outside sub-Saharan Africa.
- Studies that examined vaccine hesitancy and did not include COVID-19.
- Studies that did not report findings in the English language.

A pilot of the search strategy will be conducted to verify the appropriateness of the selected search terms and electronic databases. The electronic databases search will be recorded in tabular form. All eligible studies will be uploaded onto Endnote X9 software and duplicates will be identified and removed using this software. The scoping review is expected to commence on 01 September 2021. All efforts will be made to obtain full-text articles for the review by engaging with experts in the field, contacting relevant authors, and conducting a comprehensive search not limited to electronic databases. The authors will discuss and agree on studies that would be included in the review.

The article selection process will follow the recommendations of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extensions for Scoping Reviews (PRISMA-ScR) checklist and mapping will be done using the PRISMA-P chart. The scoping review is expected to be completed within eight to twelve weeks from commencement. This timeline will be affected by the volume of literature that would be reviewed.

Charting the data

A data charting form will be used to electronically capture relevant data from the studies that would be included in the review. The data charting tool will draw on the elements of existing data charting tools but will be designed by the authors to be unique for the proposed review. The data extracted will not be limited to the following fields: title of study, research objective(s), country and year of the study, the research methodology used, and the key findings.

Collating, summarizing, and reporting the findings

A narrative report will be generated to provide a summary of the data extracted from the included studies. The summary will the de-

tails of the charting table: Country of the study, prevalence or scope of COVID-19 vaccine hesitancy in sub-Sharan Africa, and recommended interventions to address COVID-19 hesitancy.

DISCUSSION

The proposed scoping review aims to identify and describe the prevalence and determinants of COVID-19 vaccine hesitancy in sub-Saharan Africa. It will also highlight the existing recommended strategies to address COVID-19 vaccine hesitancy. The findings of this review will provide consolidated evidence on the prevalence of COVID-19 vaccine hesitancy in sub-Saharan Africa. Additionally, it will facilitate the generation of knowledge on the contextual factors that influence acceptance or non-acceptance of COVID-19 vaccines, and highlight the implications for research, health policy, and clinical practice. The successful and timely application of this review protocol is expected to direct policy-makers as we address COVID-19 vaccine hesitancy in sub-Saharan Africa.

CONCLUSION

The review is restricted to COVID-19 vaccine hesitancy and may therefore not provide a holistic understanding of the origin of vaccine hesitancy. It should be noted that English is not the official language of several sub-Saharan African countries, hence restricting the review to studies that were reported in the English language only is a limitation of the review.

AUTHOR'S CONTRIBUTION

All the listed authors contributed significantly to the design, implementation, and development of the manuscript for publication, with approval.

DATA AVAILABILITY

Most of the data used in this systematic review are publicly available.

ACKNOWLEDGEMENT OF FUNDING

The research reported in this publication was supported by the Fogarty International Center (FIC), NIH Common Fund, Office of Strategic Coordination, Office of the Director (OD/OSC/CF/NIH), Office of AIDS Research, Office of the Director (OAR/NIH), and National Institute of Mental Health (NIMH/NIH) of the National Institutes of Health under Award Number D43TW010131. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

REFERENCES

1. Sunil C, Mamta M, Meenakshi C, Lalit G. Corona virus-SARS-CoV-2: An insight to another way of natural disaster. EAI endorsed trans. Pervasive Health Technol. 2020; 6(22): e2.
2. van Bavel JJ, Baicker K, Boggio PS, Capraro V, Cichocka A, Cikara M, *et al.* Using social and behavioural science to support COVID-19 pandemic response. Nat Hum Behav. 2020; 4(5): 460-471.
3. Dodds K, Broto VC, Detterbeck K, Jones M, Mamadouh V, Ramutsindela M, *et al.* The COVID-19 pandemic: Territorial, political and governance dimensions of the crisis. Taylor and Francis; 2020.
4. Weekly epidemiological update on COVID-19. WHO. 2021.
5. DeRoo SS, Pudalov NJ, Fu LY. Planning for a COVID-19 vaccination program. JAMA. 2020; 323(24): 2458-2459.
6. Lurie N, Sharfstein JM, Goodman JL. The development of COVID-19 vaccines: Safeguards needed. JAMA. 2020.
7. Calina D, Docea AO, Petrakis D, Egorov AM, Ishmukhametov AA, Gabibov AG, *et al.* Towards effective COVID-19 vaccines: Updates, perspectives and challenges. Int J Mol Med. 2020; 46(1): 3-16.
8. Zhao J, Zhao S, Ou J, Zhang J, Lan W, Guan W, *et al.* COVID-19: Vaccine development updates. Front Immunol. 2020; 11: 3435.
9. Dzieciolowska S, Hamel D, Gadio S, Dionne M, Gagnon D, Robitaille L, *et al.* COVID-19 vaccine acceptance, hesitancy, and refusal among Canadian healthcare workers: A multicenter survey. Am J Infect Control. 2021.
10. Sallam M. COVID-19 vaccine hesitancy worldwide: A concise systematic review of vaccine acceptance rates. Vaccines. 2021; 9(2): 160.