By The Name Of Allah

University of Dongola

Faculty of Medicine and Health Sciences

Department of Community Medicine

RESEARCH PROPOSAL

Research Title:

Knowledge, Attitude and Practice towards Zoonoses among Public Health Workers in Dongola Locality, Sudan, 2026

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1. Introduction

1.1 Background

Zoonoses are diseases and infections that are naturally transmitted between vertebrate animals and humans, either directly or indirectly through vectors, contaminated food, or the environment (1). They are a major group of emerging and re-emerging infectious diseases and impose a substantial health and socioeconomic burden, particularly in low- and middle-income countries (2).

Public health workers are at the front line of zoonoses surveillance, prevention, and control at community level. They report diseases and educate communities, so their knowledge, attitudes, and practices (KAP) influence how well zoonoses are detected and how well the health sector works with veterinary and environmental services under the One Health approach.

Studies from other countries show that general awareness of zoonoses does not guarantee detailed knowledge or safe practice. Among public health workers in Nyanza Province, Kenya, over 85% asked for refresher training on pandemic influenza (3). In Bhutan, only about half of multisectoral collaborators had above-average knowledge and attitude scores (4), and in Ghana most healthcare workers had inadequate knowledge of zoonoses (5). Their KAP therefore needs to be described in each setting.

1.2 Problem Statement

Public health workers are expected to take part in community-level surveillance, reporting, and health education on zoonoses, yet studies from Kenya, Bhutan, and Ghana show gaps in the knowledge, attitudes, and practices of similar workers (3–5). In Dongola locality, Northern State, Sudan, the knowledge, attitude, and practice of public health workers towards zoonoses have not been described, so their level in 2026 is unknown.

1.3 Justification

this study aims to assess, during 2026, the levels of knowledge, attitudes, and practices towards zoonoses among public health workers, in relation to their socio-demographic and occupational characteristics. This is important because public health workers play a key role in community surveillance, health education, early reporting, and coordination with veterinary and environmental health sectors under the One Health approach.

1.4 Research Questions

As this is a descriptive study, no hypothesis will be tested. The study will answer the following research questions:

1. What are the levels of knowledge, attitude, and practice towards zoonoses among public health workers in Dongola locality?
2. Which socio-demographic and occupational characteristics are associated with these levels?

1.5 Research Objectives

General objective

To study the knowledge, attitude, and practice towards zoonoses among public health workers in Dongola locality, Northern State, Sudan, in 2026.

Specific objectives

1. To determine the level of knowledge of public health workers regarding common zoonotic diseases, their transmission, and their prevention.
2. To assess the attitudes of public health workers towards the prevention, control, and reporting of zoonoses.
3. To describe the practices of public health workers in the surveillance, prevention, and control of zoonotic diseases.
4.

1.6 Operational Definitions

Term	Operational definition
Zoonoses	Diseases and infections naturally transmitted between vertebrate animals and humans (1). In this study, they are assessed through the zoonotic diseases listed in Section B of the questionnaire.
Public health worker	A public health officer, community health/extension worker, environmental health officer, or disease surveillance officer employed in a public health facility or administrative unit in Dongola locality, with at least six months of service.
Knowledge	The total score of correct answers on the knowledge section (Section B) of the questionnaire, with one point for each correct answer. Good knowledge: score ≥ 75% of the maximum score; moderate knowledge: 50–74%; poor knowledge: < 50%.
Attitude	The total score on the Likert-type attitude statements (Section C), with higher scores for more favourable responses. Positive attitude: score ≥ 75% of the maximum score; neutral: 50–74%; negative: < 50%.
Practice	The total score of self-reported practices on surveillance, reporting, use of personal protective equipment, and community education (Section D). Good practice: score ≥ 75% of the maximum score; moderate: 50–74%; poor: < 50%.
Good KAP (for association analysis)	A score of 75% or more of the maximum score in the knowledge, attitude, or practice section. A score below 75% is classified as “not good”.

Term	Operational definition
One Health approach	A collaborative approach in which the human, animal, and environmental health sectors work together to prevent and control disease. In this study, it is reflected in the attitude and practice items on inter-sectoral collaboration.
Prior zoonoses training	Self-reported attendance, before data collection, at any formal training, workshop, or course that included zoonoses.

2. Literature Review

2.1 International Studies

Globally, KAP studies on zoonoses have been conducted among diverse occupational groups, including farmers, abattoir workers, veterinary personnel, and healthcare workers, and they consistently show that knowledge does not automatically translate into safe practice. In Bangladesh, a cross-sectional study of 658 livestock farmers found that only about 12% had good knowledge and fewer than 40% showed good practices regarding zoonoses, and that farmers with a science-related education had higher KAP scores, pointing to the role of formal education in shaping risk perception (6). A scoping review of abattoir workers and nearby residents in low- and middle-income coun.tries similarly summarised persistent knowledge and practice gaps across several countries (7). Related work has documented comparable gaps in the handling of livestock birth products among smallholder communities in Ethiopia (8).

2.2 Regional (African) Studies

Within sub-Saharan Africa, several KAP assessments have focused on frontline occupational groups. In Nigeria, a study of 422 abattoir workers in Calabar Metropolis found generally favourable results: most workers had good knowledge, positive attitudes, and effective preventive practices regarding zoonotic diseases (9). In Ethiopia's Central Gondar Zone, a study of 400 government employees examined KAP regarding zoonotic parasites of pet animals and found that more than half of the participants had good knowledge, attitudes, and practices (10). Closer to the present study population, the study of public health workers in Nyanza Province, Kenya, found that almost all respondents discussed zoonotic diseases with community members as part of their routine work, and that rabies was the disease discussed most often; however, collaboration with veterinary colleagues and the need for refresher training remained areas of concern (3).

2.3 Local (Sudanese) Studies

To our knowledge, no published study from Sudan has assessed knowledge, attitude, and practice towards zoonoses among public health workers. Several related studies on zoonotic and other infectious diseases among different groups are summarised below.

Alfaki et al. (2016) conducted a descriptive cross-sectional study assessing KAP toward Ebola virus disease among 258 health care providers in hotspot areas of Khartoum and White Nile states. Participants were mainly house officers (40.7%) and nurses (26.4%), recruited from federal and state hospitals and health centres (11).

A subsequent KAP study (2021) evaluated 387 health care providers, including physicians, nurses, and laboratory technicians, across three tertiary hospitals in Khartoum State regarding preparedness for an Ebola virus outbreak (12).

Ali (2015), in an unpublished doctoral dissertation (University of Gezira), assessed KAP about zoonotic diseases among animal quarantine workers in Sawakin, Red Sea State. It is the only identified Sudanese study that addressed zoonotic diseases, rather than a single pathogen, in an occupational group, but its population was animal-handling personnel and not public health workers (13).

Ibrahim et al. (2018) investigated intestinal parasites mechanically transmitted by houseflies in slaughterhouses in Khartoum State, providing entomological and parasitological evidence of zoonotic transmission risk without assessing worker KAP (14).

2.4 Research Gap

Collectively, these studies indicate that Sudanese KAP research on zoonotic and related infectious diseases has been:

- Disease-specific rather than addressing zoonoses as a category (mostly focused on Ebola virus disease);
- Population-restricted, targeting hospital-based clinical staff, medical students, or animal-quarantine workers, with no study targeting public health workers;
- Geographically concentrated in Khartoum and Red Sea states, with no representation of Northern State (Dongola);
- Reactive in design, largely triggered by specific outbreak threats rather than describing the baseline situation.

To our knowledge, no published Sudanese study has assessed KAP towards zoonotic diseases as a broad disease category among public health workers, and none has

been conducted in Dongola, Northern State. This study therefore addresses a geographic, population, and thematic gap in the national literature.

3. Materials and Methods

3.1 Study Design

A descriptive cross-sectional study with a quantitative approach will be used. The study is observational: participants will be assessed once, and no intervention, training, or change in routine work will be introduced. This design is appropriate for describing the levels of KAP and their association with participant characteristics at a single point in time, and it can be completed within the available study period.

3.2 Study Area

The study will be conducted in Dongola locality, Northern State, Sudan. Dongola is the capital of Northern State and is located in northern Sudan along the Nile River. It serves as the administrative, educational, and healthcare centre of the state.

3.3 Study Population

The study population comprises all public health workers (public health officers, community health/extension workers, environmental health officers, and disease surveillance officers) employed within public health facilities and administrative units in the study area. Eligible workers will be identified from staff lists obtained, with permission, from the relevant health authority, and will be approached in person by us.

3.4 Inclusion and Exclusion Criteria

Inclusion criteria

- Public health workers currently employed and actively working in the study area at the time of data collection.
- Workers who have been in service for at least six months.
- Workers who provide informed consent to participate.

Exclusion criteria

- Public health workers on long-term leave or unavailable during the data collection period.
- Workers who decline to give consent.

3.5 Sample Size

The sample size will be calculated using the Cochran formula for cross-sectional studies: $n = Z^2P(1 - P)/d^2$, where $Z = 1.96$ (95% confidence level), P is the expected

proportion of public health workers with good KAP, and d = 0.05 is the desired precision. As no local estimate of P is available, P = 0.5 will be used because it gives the largest sample size. This gives n = 384.2, rounded up to 385. Adding 10% for non-response gives a sample size of 424.**A census sampling technique will be used to include all eligible public health workers in Dongola locality. The total number of eligible workers is 101; therefore, all 101 workers will be invited to participate in the study.**

3.6 Sampling Technique

A stratified random sampling technique will be used, with health facilities or administrative units serving as strata, followed by simple random or systematic sampling of workers within each stratum, proportionate to size.

3.7 Study Variables

- **Dependent variables:** level of knowledge, level of attitude, and level of practice towards zoonoses (defined in Section 1.6).
- **Independent variables:** age, sex, educational level, cadre (job title), years of experience, and prior zoonoses training.

3.8 Data Collection

Data will be collected using a structured, pretested questionnaire adapted from validated KAP instruments used in comparable studies (Appendix B). Participants will complete the questionnaire themselves. Data collection will be carried out by us under the supervision of the study supervisor. The questionnaire has four sections:

- **Section A:** Socio-demographic and occupational characteristics (age, sex, education, cadre, years of experience, prior zoonoses training).
- **Section B:** Knowledge of zoonotic diseases (definitions, modes of transmission, common local zoonoses, prevention measures).
- **Section C:** Attitude towards zoonoses prevention, control, reporting, and inter-sectoral (One Health) collaboration, measured using a Likert-type scale.
- **Section D:** Practices related to surveillance, reporting, use of personal protective equipment, and community education on zoonoses.

The questionnaire will be pretested on a small sample of public health workers outside the main study area (approximately 5–10% of the sample size) to assess clarity, reliability, and cultural appropriateness, and necessary revisions will be made before full-scale data collection. Where feasible, electronic data collection using a mobile-based platform (e.g., KoboCollect or ODK) will be used to reduce data entry errors.

3.9 Data Management and Analysis

Completed questionnaires will be checked daily for completeness and consistency, coded, and entered into a password-protected electronic database. The data will be cleaned (missing and out-of-range values) before analysis, which will be performed using SPSS or Stata. The analysis plan is structured according to the specific objectives:

Objective	Variables	Analysis
1. Level of knowledge	Knowledge score and category (good, moderate, poor)	Frequencies and percentages; mean score and standard deviation
2. Attitude	Attitude score and category (positive, neutral, negative)	Frequencies and percentages; mean score and standard deviation
3. Practice	Practice score and category (good, moderate, poor)	Frequencies and percentages; mean score and standard deviation
4. Associated factors	Age, sex, education, cadre, years of experience, prior zoonoses training versus good / not good KAP	Chi-square test (or Fisher's exact test); variables with $p < 0.25$ entered into multivariable binary logistic regression (adjusted odds ratio, 95% confidence interval); $p < 0.05$ considered significant

Categorical variables will be presented in frequency tables and bar or pie charts, and continuous variables as mean and standard deviation (or median and interquartile range). Dummy tables are provided in Appendix C.

3.10 Study Management and Quality Assurance

We are responsible for the questionnaire, data collection, data entry, analysis, and report writing, and the supervisor will guide the study, review the tools and the report, and follow up compliance with the proposal. The data will be used only for this study. The following measures will be taken to control bias and assure quality:

- **Selection bias:** random selection if a census is not feasible; a 10% allowance for non-response.
- **Information bias:** a pretested questionnaire with standard instructions, anonymous responses to reduce social desirability bias, and the presence of the investigators to clarify questions.
- **Confounding:** controlled in the analysis through multivariable logistic regression.
- **Data quality and storage:** daily checking of questionnaires, password-protected electronic data, and access limited to the research team.

3.11 Ethical Considerations

- Ethical approval will be sought from the relevant Institutional Ethics/Review Committee before data collection starts.
- Permission will be obtained from the relevant health administrative authorities in the study area.
- Written informed consent will be obtained from each participant after explaining the purpose, procedures, risks, and benefits of the study (Appendix A).
- Participation will be voluntary, with the right to withdraw at any stage without any negative consequence.
- This is an observational study with no intervention, so no physical risk is expected; the only burden on participants is the time needed to complete the questionnaire.
- Confidentiality and anonymity will be maintained by using unique identification codes instead of names, and data will be stored securely and be accessible only to the research team.
- Findings will be shared with the relevant health authorities and participating institutions.

4. Work Plan and Timeline

The study will be implemented over three months (September to November 2026), as shown in the Gantt chart below. The timeline may be adjusted according to institutional and ethical approval processes.

#	Activity	September 2026				October 2026				November 2026			
		W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4
1	Submission of research proposals			■	■								
2	Presentation of research proposals				■	■							
3	Ethical approval, administrative permissions, and pretesting of the questionnaire				■	■							
4	Data collection					■	■						
5	Data analysis							■	■				

#	Activity	September 2026				October 2026				November 2026			
		W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4
6	Writing and discussing the results									■			
7	Writing the final report										■		
8	Electronic submission of the research to the Department of Community Medicine											■	
9	Research evaluation (refereeing)											■	■
10	Revision of the research												■
11	Research discussion (defense)												■

W1 = days 1–7, W2 = days 8–14, W3 = days 15–21, W4 = day 22 to the end of the month.

5. Resources and Budget

Resources. The study requires the time of the two investigators and the guidance of the supervisor; printed questionnaires and consent forms; computers and internet access for literature search, data entry, and analysis; and mobile phones for electronic data collection where feasible. The study will be funded by the investigators.

Estimated budget.

Budget item	Justification	Cost (SDG)
Printing and binding of questionnaires, the research proposal, and the final report	Questionnaires and consent forms for participants; copies of the proposal and report for the Department	80,000
Transportation	Travel to health facilities in Dongola locality during data collection	200,000
Internet and communication	Literature search, communication with facilities and supervisor, electronic data collection	200,000
Data entry and statistical analysis	Entry, cleaning, and statistical analysis of the data	250,000
Ethical approval fees	Fees of the Ethics/Review Committee	50,000
Total estimated budget		**780,000**

6. References

(Vancouver style)

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