

The structure, processes and outcomes of stroke rehabilitation in Ghana: A study protocol

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Abstract

Background

Conventional and complementary treatments are often used in rehabilitation for persons with stroke. Conventional treatment makes use of medications, physiotherapy, occupational, speech and diet therapies while complementary treatment makes use of homeopathy, naturopathy, massage and acupuncture. The structure, process and outcomes of stroke rehabilitation using conventional or complementary treatments have not been empirically investigated in Ghana.

Aim

To investigate the structure, process and outcomes of stroke rehabilitation at the Korle Bu Teaching Hospital (KBTH) in Accra and Kwayisi Christian Herbal Clinic (KCHC) in Nankese-Ayisaa, Ghana and to explore experiences of persons with stroke.

Methods

A mixed methods approach involving a cross sectional, hospital-based cohort and qualitative exploratory studies. The objectives of the study will be achieved using three phases: Phase one will recruit health professionals and gather information on the structure and process of stroke rehabilitation at conventional and complementary hospital using adapted questionnaires. Phase two will determine outcomes of persons with stroke attending a conventional and complementary hospital facility at baseline, two, three- and six-months follow-up using outcome measures based on the International Classification of Functioning, Disability and Health (ICF) model. Phase three will explore experiences of persons with stroke who use complementary or conventional treatment using an interview guide.

Data Analysis

IBM SPSS Statistics Version 27 will be used to analyse the data using descriptive and inferential statistics. Repeated measures of ANOVA analysis will be used to determine differences between variables at baseline, one, three- and six-months post stroke. The qualitative data will be transcribed and entered into Atlas Ti version 9.0. The data will be coded and analysed using thematic areas that will be generated from the codes.

Conclusion

The study protocol will provide a comprehensive overview of structure, process and outcomes of stroke rehabilitation in Ghana: incorporating both conventional and complementary treatment and rehabilitation into the stroke recovery journey. It will also inform clinical practice, with new insights on the experiences of persons with stroke based on their choice of rehabilitation pathway.

Background

Stroke rehabilitation is aimed at reducing the disability related impact of stroke on individuals, enabling them to achieve independence, social integration, a better quality of life and self-actualization (1). Rehabilitation is one of the pillars used to drive universal health coverage through the use of primary healthcare (2, 3). The importance of rehabilitation medicine in the attainment of optimal functioning after an injury or disease cannot be over emphasized (4). According to the World Health Organization, rehabilitation aims to enable persons with disabilities to improve and maintain their optimal functional levels through the provision of tools to help attain independence and self-determination (5).

Conventional and complementary medicine treatments are often used in rehabilitation for persons with stroke (6–10). The usage of complementary medicine and rehabilitation has a high prevalence in the treatment for stroke in Korea (54%) and India (67%) (11); as well as developed countries such as United States, Australia, France and Canada, with its usage ranging from 42–70% (12). In Africa, complementary medicine and rehabilitation is widely used in most countries and sometimes it is the only source of primary healthcare (13–15), about 70% of the population in Ghana utilize complementary medicine and rehabilitation in one way or the other (16). Complementary medicine refers to a broad set of health care practices that are not part of the mainstream medical care in a country and are not fully integrated into the dominant health-care system (17–19). It involves the use of non-mainstream approaches of health care such as chiropractic, acupuncture, homeopathy, herbal therapy, dietary and psychological interventions (20, 21) together with conventional medicine (7, 22). Conventional medicine is the use of evidence-based treatments that are safe and effective, with rigorously tested procedures used as clinical practice guidelines (23). The focus of conventional medicine is more often on the treatment of existing ailments within the context of specific scientific framework. Rehabilitation is a major part of conventional medicine treatment, forming a major part of patient care (24).

The structure, process and outcomes (SPO) framework initially developed to assess the quality of health care, has recently been used to examine outcomes related to differences in structure and process of rehabilitation and the relationship between structure and the process of rehabilitation (8, 25, 26). The SPO framework will be utilized in this study in addition to the International Classification of Function, Disability and Health (27) to conceptualize outcomes post stroke which include impairments, activity limitations and participation restrictions of persons with stroke utilizing conventional or complementary medicine and rehabilitation in Ghana.

By undergoing a specific stroke rehabilitation pathway, persons with stroke can achieve their best possible functional independence, which ultimately improves their quality of life (7). Good outcomes after stroke have been seen in patients undergoing rehabilitation in the conventional setting (9, 28–32). Stroke outcomes have also been shown to be better in cases managed at the stroke units with multi-disciplinary care (33). In the Ghanaian context, the coordination of stroke care after discharge from acute care is fragmented (34), with further rehabilitation after acute care poorly addressed due to accessibility of care issues (35). For this reason, some patients and or their caregivers chooses to use rehabilitation in a complementary or conventional setting as treatment for stroke based on availability in the community and acceptability to their health beliefs or religious faith (7, 36), and sometimes as a substitute for absence of conventional rehabilitation (7, 37). However, there is paucity of information on the outcomes of persons with

stroke who use complementary medicine and rehabilitation in Ghana. In an era where complementary healthcare services are being introduced gradually to mainstream healthcare (16, 38, 39), it is important to investigate and document the structure, processes and outcomes of complementary medicine and rehabilitation in a resource constraint environment (40). Currently there is no and little data on outcomes of persons with stroke who use complementary and conventional medicine and rehabilitation in Ghana respectively. Published literature has focused more on conventional medicine and rehabilitation, with little or no literature existing on complementary medicine and rehabilitation. This study will fill the gap by providing information on structure, process and outcomes of stroke rehabilitation in a conventional and complementary hospital setting in Accra and Nankese-Ayisaa, Ghana.

The purpose of the study is to comprehensively describe the structure and processes of stroke rehabilitation: to investigate the outcomes of persons with stroke who utilize conventional or complementary medicine and rehabilitation. It is hoped that the findings can pave the way for more studies assessing the association between structure, process and outcomes of stroke rehabilitation in low resource settings.

Objectives

The study will be guided by the following objectives:

- 1: To determine the structure of stroke rehabilitation using conventional and complementary medicine at KBTH in Accra and KCHC in Nankese-Ayisaa, Ghana.
- 2: To determine the processes of stroke rehabilitation using conventional and complementary medicine at KBTH in Accra and KCHC in Nankese-Ayisaa, Ghana.
- 3: To determine the outcomes of participants in relation to their impairments, activity limitations and participation restrictions at baseline, two, three and six-months follow-up at KBTH in Accra and KCHC in Nankese-Ayisaa, Ghana.
- 4: To explore the experiences of persons with stroke about the process and outcomes of their rehabilitation at a conventional or complementary rehabilitation after six months of rehabilitation at KBTH in Accra and KCHC in Nankese-Ayisaa, Ghana.

Design And Methods

Study design

This study will adopt a triangulation, mixed-method approach (quantitative and qualitative) (41). The quantitative part will involve a cross-sectional and hospital-based cohort study while the qualitative part of the study will be a descriptive exploratory study of health professionals and persons with stroke in a conventional and complementary hospital in Accra and Nankese-Ayisaa, Ghana. The data will be collected at the stroke unit and physiotherapy department, KBTH and the out-patient department and physiotherapy department, KCHC. A hospital-based cross-sectional study will be conducted from November, 2021 to April, 2022 on health professionals to gather information about their numbers and availability of equipment for

rehabilitation at the hospital and the compliance with the agency for healthcare policy and research (AHCP) using adapted questionnaires. The cohort study will assess outcomes of persons with stroke using outcome measures at baseline, two, three and six months follow up from December, 2021 to April, 2023. The baseline measurement will be within a month after the start of treatment. The qualitative exploratory design will be used to explore experiences of persons with stroke regarding their rehabilitation process and outcomes in a conventional or complementary rehabilitation setting from June, 2022 to August, 2022. The study will be carried out in three phases.

Participants and setting

The study population will comprise of all health professionals involved in stroke care at the study sites; and all persons with stroke at KBTH and KCHC during the study period fulfilling the inclusion criteria.

Eligible participants should:

- i. be aged 18 years and above;
- ii. clinically diagnosed with stroke by a medical officer/using clinical signs;
- iii. those within a month after starting rehabilitation;
- iv. have a modified Rankin score (MRS) of less than 4;
- v. willing to come for follow up assessment at two, three and six-months post recruitment into the study;
- vi. speak either English, Ga or Twi (Ghanaian local languages).

Potential participants with other neurological conditions, second episode of stroke, spinal cord injuries, head injuries, dementia, seizures; psychological or mental instability, inability to communicate verbally and comprehensively as a result of global aphasia will be excluded from the study.

Phase one of the study will be carried out at the stroke unit and physiotherapy department, KBTH and the out-patient department and physiotherapy department, KCHC; phases two and three will be carried out at the physiotherapy department of the two facilities. The KBTH is the premier and largest teaching hospital, located in the Greater Accra region of Ghana, with a population of 5.4 million (42). The Accra metropolis, in the Greater Accra region has a population of 1,665,086 spread across 60 square kilometres, consisting of both urban and peri-urban areas (43). The KBTH is a 2000 bed capacity referral hospital in the southern part of Ghana, with a stroke unit incorporating multi-disciplinary professionals for stroke management (44).

The KCHC is a herbal clinic located in Nankese-Ayisaa, in the Eastern region of Ghana, which has a population of 2.9 million (42). Nankese-Ayisaa is part of the Suhum Municipality, approximately 60km from Accra, the national capital. Suhum Municipality has a population of 90,358 spread across 359 square kilometres, consisting of both urban and rural areas (43). The hospital uses complementary medicine (herbal medicine) and nutritional supplements in the treatment of stroke patients. They also undertake out-patient rehabilitation services using massage therapy, herbs, exercise therapy, and dietary counselling. The facility focuses on stroke care using herbal preparations and food supplements under the standards set by the Traditional Medical Practice Council in Ghana (16).

Recruitment

All health professionals involved in stroke care at the study sites will be recruited for the study. The estimated average monthly population of new stroke patients at the physiotherapy department of KBTH and KCHC is 20 and 10 respectively during the 2021 mid-year performance review (45, 46). A power calculation at 80% power, 5% level of significance, 95% confidence interval was used to determine the number of participants to be recruited. Assuming a 70% and 50% recovery rate for patients using conventional and complementary treatment respectively, a 10% non-response rate and with standard approximations for loss to follow up, a sample size of 200 is estimated. Therefore, a total of 100 participants will be recruited at each study site to retain statistical power. All eligible participants will be consecutively enrolled into the study. The study will be carried out over a window period of 18 months.

A sample size of up to 20 participants will be selected purposively, with 10 at each study site for the qualitative study. 'Information power' meaning the amount of relevant information needed for the study determines the number of participants for the study (47) will be used to settle on the final sample size.

Data collection

Data collection instruments

The data collection will involve three phases: structure and process of care for health professionals, outcomes and experiences of persons with stroke with their rehabilitation process and outcomes. The questionnaires for the quantitative study will be validated and tested for reliability by administering it to health professionals at the physiotherapy department of Komfo Anokye Teaching Hospital (KATH) and out-patient department of Amen Scientific Herbal Hospital (ASHH) in Kumasi in a pilot study. The interview guide for the qualitative study will also be piloted on persons with stroke at KATH and ASHH, to determine whether it answers the research questions for the study and the time it will take to administer the interviews. The KATH and ASHH have similar characteristics as the study sites for the study in terms of structure and population.

Phase 1: Structure and process of care

An adapted questionnaire redesigned by Rhoda (8) based on the taxonomy developed by Hoenig et al (48) will be used to collect data on the structure of stroke rehabilitation. The questionnaire consists of four main domains. Domain one consists of socio-demographic information of professionals such as age, gender, highest qualification, year of qualification; domain two consists of information on professional expertise such as the availability of professionals and the interventions used: domain three consists of capacity building of professionals such as attendance of continuous professional education, presence of team meetings and use of outcome measures and domain four consists of rehabilitation equipment available at the facility.

An adapted questionnaire will be used to measure the process of care for persons with stroke by compliance with the agency for healthcare policy and research (AHCPR) and clinical guidelines for post-stroke rehabilitation (26). The questionnaire uses a Likert scale to gather information relating to multidisciplinary

team coordination, baseline assessment of patients, monitoring and evaluating progress and management of impairments and functional limitations of patients.

Phase 2: Outcomes of rehabilitation

Table 1 shows the outcome measures, their assessment methods and assessment time points. Primary and secondary outcome measures will be assessed in each participant at each assessment time point (baseline, 2-, 3- and 6-months post-stroke). The primary outcome will be improvement of voluntary movement of the limbs and basic mobility. The secondary outcome measures will be improvements in stroke-specific functional and quality of life measures based on the impairments, activity limitations and participation restrictions: Montreal Cognitive Assessment Scale (MoCA), Stroke Rehabilitation Assessment Movement (STREAM), Time Up and Go test (TUG), 10-meter walk test (10MW), Tinetti scale (TS), Reintegration to Normal Living Index (RNLI) and Health Related Quality of Life for Stroke Patients (HRQOLISP). The instruments have been used in Sub Saharan Africa with good reliability measures (49-55).

Phase 3: Experiences of participants

An interview guide will be developed by the authors from literature. The guide will gather information the experiences of persons with stroke on the process and outcomes of their rehabilitation.

Table 1: Summary of outcome measures and respective methodology

Outcome	Measurement Method	Time Points (Months)
Improvement of voluntary movement of the limbs and basic mobility	STREAM	baseline, 2-, 3- and 6-months post-stroke
Gait and balance	TS test	baseline, 2-, 3- and 6-months post-stroke
Walking ability	TUG test	baseline, 2-, 3- and 6-months post-stroke
Cognitive function	MoCA test	baseline, 2-, 3- and 6-months post-stroke
Walking speed	10MW test	baseline, 2-, 3- and 6-months post-stroke
Reintegration in terms of ADLs, social and recreational activities and interactions with others.	RNLI	baseline, 2-, 3- and 6-months post-stroke
Quality of life	HRQOLISP	baseline, 2-, 3- and 6-months post-stroke

Data collection procedure

Phase 1: Structure and process of care

The study will commence after permission from authorities at the study sites has been granted. Standardized training in all aspects of the study instruments will be provided to research assistants for one week on how to administer the instruments and score the participants. The first author will attend one of the clinical meetings for health professionals at the study sites. The purpose and objective of the study will be explained to them and they will be invited to participate in the study, by completing the questionnaires after signing a consent form. The adapted questionnaires will be administered to the health professionals after the clinical meeting and follow-up meeting with them. Weekly reminders and periodic visits will be conducted at the sites to increase the response rate of the questionnaires. An online generated version of the questionnaires will also be sent for participants who prefer that. The questionnaires will take about 15 minutes to complete and available in English.

Phase 2: Outcomes of rehabilitation

The records unit of the study sites will be approached for the list of persons with stroke and their contacts of those receiving care or attending physiotherapy at the facility. The patients will be contacted and the purpose of the study explained to them and their caregivers. An appointment will be set up for screening and participants meeting the inclusion criteria invited to participate in the study. Those who agree will be recruited into the study, after signing a consent. In addition, the first author will approach patients who report for physiotherapy services for recruitment into the study. The research assistants will administer the bio-demographic questionnaire first, followed by the stroke levity scale, to assess the severity of stroke (56), then the other self-reported questionnaires such as RNLI and HRQOLSP at baseline and the observer rated questionnaires such as STREAM, TS and MoCA. Once the observer-rated instruments are completed, the first author will continue to conduct the objective assessments such as the TUG and 10MW tests.

The TUG will be performed with patients seated on a chair with arm rest and a measured distance of three meters from the chair. The time taken for the patient to stand up from the chair and walk towards the three-meter mark and turn back and sit on the chair will be recorded. The participant may use the arms of the chair to stand up or sit down and walk as fast and safe as possible. The participant can wear their regular foot wear, may use any gait aid or assistive device that they normally use during ambulation, but may not be assisted by another person. There is no time limit. They may stop and rest (but not sit down) if they need to. The time for two trials will be recorded.

The 10MW test is performed by recording the time patients walk without assistance a distance of 10 meters. The time is recorded for intermediate 6 meters to allow for 2 meters of acceleration and deceleration. The use of assistive devices or physical assistance is allowed, but should be kept consistent and be documented. The documentation will include normal and fast walking speed. The time for three trials will be recorded and the average calculated for normal and fast speed. Once the researcher and assistants have finished collecting the baseline data, the participants will be informed that they would be contacted for an appointment for the two-, three- and six-month follow-up assessments. The two-, three and six-month follow-up assessments will be done by the same researcher or assistant who had conducted the baseline assessments within a window period of seven working days either before or after the actual two-, three and

six-month post-stroke date. The estimated duration for all the assessments will be one hour. The questionnaires will be available in either English, Twi or Ga and will be administered in the language the participant prefers.

Phase 3: Experiences of participants

The first author will advertise phase 3 of the study to eligible participants who have completed six months stroke rehabilitation at either the conventional or the complementary facility. The purpose and objectives of the study will be explained to the participants. Participants who agree to be part of the study will have either a written or audio consent taken; permission will also be taken to record the interviews. The first author will administer a one-on-one audio interview with participants using an interview guide in a quiet venue, chosen by the participant, either in their homes or at the clinic. The first author will take notes during the interview, which will last for a maximum of 40 minutes. The interview guide will be available in either English or Twi (language spoken by the first author) and will be administered in the language the participant prefers.

Translation of the questionnaires

The outcome measures are available in English and will be translated from English to Twi and Ga (Ghanaian local languages) by a team of translators, with experience in questionnaire translation from University of Ghana and Kwame Nkrumah University of Science and Technology. The translated questionnaires will be backward translated into the original language (English) by another translator. The translators will not be associated with the study and independent of each other in the translation process. Modifications and changes will be done taking into account local context where needed (57) after agreement with the translators. The content of the translated items will be checked to see if it remained the same irrespective of the translation process.

Data analysis

Quantitative data

The data will be captured and stored in an encrypted Microsoft Excel file. Following data collection, the data will be cleaned and checked for accuracy. The data will be transferred into Statistical Package for the Social Sciences (SPSS) version 26 and analysed using both descriptive and inferential statistics. Frequencies of socio-demographic and outcome variables will be determined. The frequencies will relate to data collected at baseline, two, three- and six-months post-stroke. The frequencies will be presented in the form of means and standard deviations or medians and interquartile ranges depending on the distribution of the dataset. The Kolmogorov–Smirnov test will be used to assess normality of the data. Participants who are not able to perform any of the items on the scales at baseline and at follow up visits, a value of 0 will be assigned to them, because this score correctly reflects the subjects' inability to perform any of the items. A repeated measure ANOVA will be conducted on all outcome measures with time (pre-post) as within subject variables and between subject variables at each study sites. Comparisons will be made with the entire sample as well within each subgroup classified by scores on the stroke severity scale (mild, moderate, severe). Comparisons among all of the measures will be made for the 4-time intervals: baseline, two-, three- and six-month

assessments. An independent t-test will be used to compare the differences in age, gender, improvement of voluntary movement of the limbs, basic mobility, gait and balance, walking ability, cognitive function, walking speed, quality of life and reintegration (activities of daily living, social, recreational activities and interactions with others). To compare the changes at each site while adjusting the effect of confounding variables, the covariance analysis model or the relative change analysis will be used. Questionnaire scores between baseline, two-, three- and six-month post stroke assessments will be compared using a generalized linear model. In all cases where differences occurred between baseline, two-, three- and six-month post stroke assessments, post-hoc analyses with Bonferroni's adjustments for multiple comparisons will be done. For missing data imputation, the last value carried forward (LVCF) method will be used. A p-value of less than 0.05 will be considered statistically significant.

Qualitative data

The data collected will be analysed using Atlas Ti version 8.0. The interviews together with the field notes will be transcribed verbatim into text by an independent transcriber fluent in English and or Twi. The interviews in Twi will be translated into English and checked by another transcriber to make sure all the interviews are correctly translated until consensus in the final translation is agreed on. The translated interviews will be transcribed into text (English). The text will be entered into Atlas Ti version 8.0 for analysis using thematic analysis. The analysis will be performed by reading the text to familiarize with the data, establishing meaningful patterns, generating initial codes, searching for themes among the generated codes, reviewing the themes, defining and naming the themes and producing the final report. Data from field notes will also be analysed and added to the results to enhance the meaning of the information gathered. The themes and sub-themes that emerge from the data will be supported with verbatim quotes from the participants' transcribed data.

Trustworthiness of qualitative data

The credibility of the research will be ensured by explaining to the participants that participation in this study is completely voluntary and they can choose not to participate in this research. The researcher will gather required information from the participants during the interview process using additional probes. The credibility of the research will also be ensured by keeping a reflexive journal where the researcher's assumptions, thoughts and ideas about the research topic and the disclosures of the participants during the interview process will be noted. Member validation will be done to ensure that the participants' experiences about stroke rehabilitation will be accurately represented in the data gathered. The transcribed data will be given to the participants to review during the data analysis and to provide feedback to ensure their transcribed interviews were accurately recorded and the themes generated are meaningful to them. Transferability and dependability of the study will be ensured by giving detailed information about this study, as documented in the comprehensive methodology and by keeping field notes using a reflexive journal. Lastly conformability will be obtained through an audit trail of the procedures done.

Dissemination plan

Findings of the study will be published in peer-reviewed journals: it will also be presented as abstracts or posters in conferences and as a lecture. It will also be presented to clinicians and policy makers and finally a thesis will be submitted to the University of the Western Cape, South Africa. A report will be written for the funders of the study and summary findings to the study participants.

Discussion

This study protocol offers an investigation of the structure, process and outcomes of persons with stroke in two different contexts six months post stroke. The research questions that this study aims to address are:

1. the structure, processes and outcomes of care for persons with stroke using either conventional or complementary rehabilitation in Accra and Nankese-Ayisaa, Ghana.
2. the experiences of persons with stroke about the process and outcomes of their rehabilitation at a conventional or complementary facility after six months of rehabilitation in Accra and Nankese-Ayisaa, Ghana.

Ghana has a vibrant pluralistic healthcare system made up of both mainstream biomedical (conventional) and complementary (herbal) health systems, which are all involved in stroke care and rehabilitation (58). In many rural and semi-urban areas in Ghana, most patients with stroke tend to use complementary medicine treatment either exclusively or parallel with conventional medicine (40, 59) for varied reasons ranging from faith and cultural congruence to accessibility, cost, and belief that these approaches are safe (40, 60, 61).

Some persons with stroke and their family members believe stroke is a spiritual illness caused by evil spirits or witches and as such the need to resort to herbal and faith healing clinics after discharge from conventional hospitals (36, 40, 61–63). Some of these reasons have led to patronage of complementary rehabilitation among persons with stroke in addition to conventional rehabilitation in Ghana (40, 61). In an era where complementary healthcare services are being introduced gradually to mainstream health care (16, 38), it is important to investigate and document the structure, processes and outcomes of complementary medicine treatment in a resource constraint environment (40).

The study will provide information on the structure and process of stroke rehabilitation in a conventional and a complementary setting and explore the experiences of persons with stroke who attend rehabilitation at the two different settings. The study will also determine outcomes of stroke rehabilitation in a conventional and complementary rehabilitation setting in Ghana after a six-month follow-up. This study will inform clinical practice for stroke rehabilitation in Ghana and ultimately help in improving stroke management.

A limitation of this study will be drop-out rate of the participants which may affect the analysis of the final data. Furthermore, the outcomes achieved by the study participants at the different sites cannot be compared since there was no standard intervention given and no randomization of participants recruited into the study.

Conclusion

The results will provide a comprehensive overview and insight into stroke rehabilitation in Ghana in terms of structure and process of care, incorporating both conventional and complementary treatment and rehabilitation into stroke survivors' recovery journey. It will also provide an objective information on the outcomes of stroke survivors using the two different routes and address the implications of the different pathways of the current overview of the structure and process of stroke rehabilitation in Ghana by gathering data from health professionals and persons with stroke.

Study status

This study is currently at the data collection stage.

Abbreviations

KBTH: Korle Bu teaching hospital; KCHC: Kwayisi Christian herbal Centre; ICF: International Classification of Functioning, Disability and Health; ANOVA: analysis of variance; AHCPR: agency for healthcare policy and research; MRS: modified Rankin score; ASHH: Amen Scientific herbal hospital; KATH: Komfo Anokye teaching hospital; STREAM: Stroke Rehabilitation Assessment Movement; MoCA: Montreal Cognitive Assessment; TUG: time up and go test; 10MW: 10 minutes walk test; TS: Tinetti scale; RNLI: reintegration to normal living index; HRQOLSP: health related quality of life in stroke patients; UHAS: University Of Health And Allied Sciences; IRB: Institutional Review Board; REC: Research Ethics Committee; LVCF: last value carried forward.

Declarations

Acknowledgements

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Authors' contributions

CY and AR conceptualized the study with input by GGN. CY drafted the manuscript with input provided by GGN and AR. The draft manuscript was reviewed by AR and GGN. AR assisted with letters for partial funding for the data collection. CY drafted the ethical clearance documents for the study with assistance by AR. Study design and methods was conceptualized by CY, GGN and AR. CY drafted the first version of the manuscript with inputs by GGN and AR, CY addressed all co-authors' comments and made the final draft of the manuscript. All authors reviewed the draft manuscript and provided approval to the final manuscript.

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Availability of data and materials

The full protocol for the current study and supplementary materials including the datasets for the study and or to be analysed are available from the corresponding author on reasonable request.

Ethics approval and consent to participate

Ethical approval has been granted by Biomedical Sciences Research Ethics Committee of the University of the Western Cape, South Africa (BM20/5/25), the University of Health and Allied Sciences Research Ethics Committee (UHAS-REC A.1 [15] 20-21) and the Scientific and Technical Committee/Institutional Review Board of Korle Bu Teaching Hospital, Ghana (STC/IRB/000113/2020). The study protocols as well as data collection instruments, the participant information statement has been reviewed by the ethics committees for approval. The study will adhere to the ethical guidelines of the Declaration of Helsinki in 2013 (World Medical Association Declaration of Helsinki) (64) and the methods as stated in the protocol. All study participants will be informed about the purpose and objectives of the study and asked to sign an informed consent form prior to participation. The right of participants to safeguard their anonymity and integrity will be respected. All participants will be adequately informed of the aims, methods, consent to participation, potential risk/benefits, voluntary participation, privacy/confidentiality, compensation, declaration of conflict of interest. Signing the informed consent is necessary for recruitment.

Consent to publication

Not applicable.

Competing interests

The authors declare that the research will be conducted in the absence of any commercial or financial relationships hence no competing interests.

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