

A scoping review of age-related health conditions among geriatric populations in sub-Saharan Africa

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Abstract

Background Globally people are living longer, resulting in an increased demand for primary care services to be responsive to geriatric health needs. There is however, little information on the nature and prevalence of age-related health conditions among older adults in the sub-Saharan African (SSA) region. This scoping review was undertaken to synthesise evidence on the scope and nature of age-related health needs among people aged 60 years and older in SSA. **Methods** We systematically searched five electronic databases for studies published prior to 30 June 2019. Using the keywords “Africa”, “older adult” or “geriatric”, and “health”, two independent reviewers used a set of eligibility criteria to extract and screen the abstracts and full-text publications. Particular focus was given to age-dependent disorders in people over 60 years such as dementia, disability and falls **Results** Sixty-four studies met the inclusion criteria. The review revealed a noticeable absence of studies from the majority of Sub-Saharan African countries. Publications included for review represent twelve countries from this region. The morbidities reported on included dementia, functional impairment, mental health, falls, sarcopenia and nutritional disorders, sensory impairment, frailty and musculoskeletal disorders. Many of these conditions co-existed among older adults, resulting in impaired quality of life and disability. Modifiable factors for geriatric morbidity such as hypertension, depression, cognitive and sensory impairments were under-diagnosed and often untreated. Low awareness and management of these conditions were noted among health providers and communities in SSA region. **Conclusions** The body of empiric research and evidence on age-related health conditions in geriatric people in SSA remains small. Further research is required on screening and management programs for age-related conditions in people over 60 years in SSA, and health professions training in the care of older adults. **Ethics and dissemination** : This study did not include human participants. Data was sourced from published literature. **Keywords:** older adult - geriatric - aged - health - Africa

Background

Globally, people are living longer. As people age, the prevalence of age-related health conditions such as cognitive, functional and sensory impairments increase. This is of particular significance to countries in sub-Saharan African (SSA) countries where the geriatric population, as defined by the United Nations to include people aged 60 years and older, is increasing at a more rapid rate than in any other region in the world.(1-3) Currently, health systems and health professions training in SSA provide little coverage of age-related health conditions prevalent in the geriatric population in SSA.(4, 5) Healthcare systems in SSA prioritize communicable diseases, maternal and child health in accordance with the Millennium Development Goals (MDG).(6) In contrast, there has been limited planning for the health needs of the growing geriatric population.(5)

The number of people aged 60 years and older in SSA is predicted to increase from 45 million in 2015 to 157 million in 2050.(7) In response, the African Union Policy Framework and Plan on Ageing (AU plan) recommends that local health systems be aligned with the needs of older populations, but provides little detail on how to address this.(8) This could be due, in part, to the limited data on the health and medical

needs of geriatric people in SSA. Ageing is associated with chronic and age-related health conditions, as well as functional decline and loss of independence. Consequently, the health burden among older adults is disproportionately higher than that in other age groups. It is estimated that older adults account for 23% of the global burden of disease.(9) This proportion is higher in low- and middle-income countries (LMIC) where studies indicate that older adults face a greater morbidity and disability burden than their counterparts in high-income countries(HIC), and are unlikely to receive the required care.(10, 11) Most primary health services are structured around curative care and fail to address the complex and diverse health conditions in the elderly. Cognitive impairment and sensory impairments are often accepted as a sign of aging and very little is done to examine the potential treatment of such impairments.

There are few geriatricians and specialised geriatric services in Africa to care for the ageing population. (12) Hence, most older adults access health services at primary care level. Unfortunately, there is little inclusion of geriatric core competencies in health professions training to prepare primary care providers to care for the increasing number of geriatric patients.(4) The increasing demand for geriatric health services in SSA could further compromise the fragile and resource-constrained health systems in SSA.(9, 10, 13) Most of the evidence on geriatric health needs are derived from studies conducted in high income countries (HIC) with different health systems and resources to this region. Furthermore, a lack of planning for age-related health needs could negatively affect the quality of life of older adults, and lead to out-of-pocket expenditure for health costs.

This study was conducted to identify, explore and map literature on age-related health conditions and associated factors among geriatric people in SSA. The results of this review is intended to inform health policymakers and health professions educators of services required by people aged 60 years and older in SSA. It will also impact on the education and training of healthcare providers for the primary healthcare system. It is anticipated that the study will also identify gaps for further research.

Methods

This scoping review was guided by the methodological framework proposed by Arksey and O'Malley.(14) The objectives of the review, the inclusion criteria and methods were specified in advance and documented in a protocol.(15) Thus the following five steps were followed in conducting the scoping review, (i) identifying the research question, (ii) identifying relevant studies, (iii) selection of eligible studies, (iv) charting the data and (v) collating and summarizing the results.

Identifying the research question

The specific research questions were as follows:

- What age-related health conditions are reported on in people aged 60 years and older in in sub-Saharan Africa(SSA)?
- What is the incidence and prevalence of age-dependent disorders in people aged 60 years and older in sub-Saharan Africa?

- What are the factors associated with disorders in people over 60 years in SSA?
- How can health services and health professions training address age-related health conditions prevalent among geriatric people in SSA?

Search strategy and selection criteria

Five electronic database (Pubmed, Web of Science, Biomed Central, Academic Search Complete and WorldCat Dissertation) were systematically searched to identify relevant primary research studies from inception until 30th June 2019. These databases include clinical trials, theses, and scientific publications. The following Medical Subject Headings (MeSH) were used: older adult, geriatric, aged, primary care, health and Africa. An example of the full search strategy can be seen in Table 1.

The inclusion criteria applied to studies from the literature search are described in Table 1. Particular focus was given to age-dependent disorders in people over 60 years such as dementia, disability and sensory impairments. These conditions are associated with increased use of health services and therefore most likely to affect the quality of life in this age group. Studies published outside the study period, from countries other than the SSA countries, that involved residential care or in-patient participants, not primary studies and not available in full text, were excluded from the analysis.

The initial search conducted in July 2019 yielded 10 683 potential articles, of which 389 were eligible for inclusion (Table 1). The results of each database and manual search were downloaded into Endnote X9 software programme (Thomas Reuter). The number of articles for review was reduced to 308 after the removal of duplicates.

Table 2 – A PEO framework for eligibility of studies

Criteria	Determinants
P- Population	Adults 60 years and older in SSA
E- Exposure	Ageing
O- Outcomes	Age-related health conditions such as dementia, frailty, sensory impairments, functional status or disability

Two independent reviewers (KN & UKZN co-reviewer) screened the abstracts and full-text articles of the relevant publications, while applying the selection criteria. A further 229 articles were excluded after screening of the abstracts. Full-text screening was conducted on 79 articles, of which 46 publications were identified as meeting the inclusion criteria. These were included in the final analysis. Disagreements were resolved through discussion. A manual search was also conducted of the references of the included studies and the Directory of Research on Ageing in Africa website to identify potentially relevant literature. A further eighteen studies from the manual search were added resulting in a total of sixty-four articles included in this review. The selection process followed the recommendations in the Preferred Reporting

Items for Systematic Reviews and Meta-Analyses (PRISMA) statement, and was mapped using the PRISMA-P chart (Figure 1). (16)

A data charting form was developed to electronically capture the relevant information from each included study. The extracted data included the following fields: author and year, country, study population, study design, female-to-male ratio of participants, health condition investigated, key findings and recommendations. (Appendix A) The included studies were analysed quantitatively according to country and health condition reported on, as well as qualitatively. The relevant findings are reported in a narrative for each identified health category.

Results

This review was conducted to map and describe the prevalence and associated factors of age-related health conditions among geriatric populations in SSA as reported in the literature. A total of sixty-four observational studies on age-related health conditions in people aged 60 years and older in SSA were included in the review.

Characteristics of included studies

All studies included both male and female participants over the age of 60 years. Eighteen studies investigated participants 60 years and older, while some were restricted to participants 65 years and older (n=36), and some 70 years and older (n=9). Almost all the studies included more female than male participants, indicative of the gender disparity in populations over 60 years. Sample sizes of participants in the studies ranged from 98 to 2429 participants.

The studies included for review originated from twelve SSA countries. Most of the publications described research from Nigeria (n=33), while nine each were from South Africa and Tanzania, four combined studies from the Republic of Congo (three of which include participants from Central Africa Republic) and three from Ghana. There was one study each from Benin, Botswana, Kenya, Malawi, Rwanda and Zimbabwe. There was a noticeable absence of studies from the majority of countries in the SSA region (Figure 2).

All publications reported on observational or descriptive studies. The studies were grouped and analysed according to reported areas of geriatric health as indicated in Table 2.

The findings are described according to each reported age-related health condition.

Dementia and cognitive impairment

Almost a third of the included studies reported on dementia and/or cognitive impairment. Prevalence rates of cognitive impairment ranged between 10.4%, reported by Guerchet et al. 2009(19) among people older than 65 years in Benin, to 19.7% in the same age group in Nigeria investigated by Adebisi et al. 2016.(17) Adebisi et al. 2016 also established a significant association between mean arterial

pressures(MAPs) of 114 mmHg and more with cognitive impairment. Mean arterial pressure was a surrogate marker for elevated blood pressure and cardiovascular risk.(19) Advanced age, current depressive disorder and absence of the APOE 2 allele were all significantly associated with cognitive impairment.

Gureje et al. 2011 investigated the incidence of dementia among a cohort of people aged 65 years and older in Nigeria over three years.(11) The estimated incidence was 21.85 per 1000 years. More rural residence, low socio-economic status and social isolation were noted to be associated with risk for incident dementia. The prevalence of dementia among people aged 65 years and older ranged from 2.6% in Benin (19) to 11% in rural South Africans.(18) De Jager et al. 2016 further reported an estimated prevalence of dementia of 8% in rural South Africans aged 60 years and older, which was similar to that reported by Ochayi et al. 2006 in Nigeria, and noted a high correlation between depressive symptoms and dementia.(18) Longdon et al. 2013 reported a lower prevalence of 6.4% among elderly aged 70 years and older in Tanzania. This could possibly be due to the poor survival of individuals with dementia. A two-year cohort study in Congo by Samba et al. 2016 demonstrated a 2.5 times greater risk of mortality in people with dementia compared to those with normal cognition.(32) Furthermore, Paddick et al. 2015 reported dementia to be the single strongest predictor of mortality among the elderly in Tanzania.(29)

Other negative health outcomes associated with cognitive impairment and dementia were behavioural and psychological symptoms (BPS). These were noted to be prevalent in 86% of participants with dementia in a study by Yoro-Zohoun et al.2019.(57) The most commonly reported symptoms were depression, anxiety, and irritability.

Cognitive impairment frequently co-existed with other impairments in the elderly. A study by Uwakwe et al.2009 in a study in Nigeria found nearly one-fifth of the sample had some comorbidity between cognitive and physical impairments. In a cohort study involving 1559 participants over a ten-year period, Ogunniyi et al.2011 discovered weight loss among Yoruba Nigerians to be a significant predictive factor for cognitive impairment and incident dementia.(25) This was reinforced by findings by Ochayi et al.2006 that low body mass index was a risk factor for dementia.(23) Studies on nutrition in the elderly have also documented the increased prevalence of undernutrition among those with dementia.(70)

All studies included in this review documented advanced age as a prominent risk factor for cognitive impairment and dementia, while female gender was reported to be an associated risk for dementia only in some studies.(17, 20, 23, 27) People with dementia frequently had co-morbidities such as hypertension and depression that were not addressed by primary health services. Social engagement and stimulation were noted to be protective factors against dementia.(21, 33)

Disability

Studies from Nigeria(34, 38-40, 42, 44, 45), Tanzania (36, 37, 41), Zimbabwe(35) and South Africa(43) evaluated functional impairment in the elderly. Ajayi et al. 2015 reported a prevalence of 83% of functional disability among participants above 60 years attending a primary care clinic in Nigeria.(34)

The most prevalent functional disabilities were with grooming and personal hygiene, and transferring from bed to chair. In an older study, the prevalence among community-dwelling elderly in Zimbabwe was much lower. Less than four percent experienced difficulty with self-maintenance activities of daily living, but 30% had difficulty with instrumental activities.(35) Dewhurst et al. 2012 reported that the prevalence of disability in the geriatric population in Tanzania was lower than that reported in populations in Europe. This could be due to low survival rates of older adults with disabilities, or institutionalization of those with profound disabilities. Age, gender and the presence of neurological disorders were identified as independent risk factors of physical disability. Sensory impairments such as blindness and hearing impairments were commonly associated with functional impairments. Other physical barriers to functional independence were stroke and the inability to walk without an aid. Chronic pain, poor health and under-nutrition also increased the risk of disability.(38) Musculoskeletal pain was the most likely chronic condition to result in disability, according to Ojagbemi et al. 2016.(42) However, it was cognitive more than physical impairment that resulted in greater functional dependence. In a study in Tanzania, Dotchin et al. 2015 suggested that screening for early signs of cognitive decline would allow management strategies to be implemented in order to reduce the associated disability burden.(36) Multiple studies highlighted the co-existence of depression, poor quality of life and disability. (43, 45)

Unsurprisingly, social factors such as poverty and illiteracy were more prevalent in people with disabilities.(34) A high burden of unmet need for care was reported in the disabled elderly. The provision of hearing and walking aids that could limit disability were not accessible to most elderly.(38) There was also a lack of adequate care-givers. About 20% of elderly requiring assistance with daily activities did not have a care-giver.(38) Protective factors against disability were physical activity and strong social networks.

The twelve included studies all highlight the short-comings of single-disease orientated primary care in assisting the elderly who have a high prevalence of functional disability. Social and health system support was found lacking for the disabled elderly in sub-Saharan Africa.

Mental and neurological disorders

Dewhurst et al. 2013 reported on high prevalence rates of neurological illnesses in the elderly in Tanzania. (47) The most common of these were tremor, headache, neuropathies, stroke and Parkinsonism.

Studies in Nigeria (48, 49, 52-54, 56), South Africa (43, 51, 55), Ghana(50) and Tanzania (47) investigated the incidence, prevalence, risk and associated factors for depression in the elderly. Depression was common among elderly population. In Nigeria, the incidence of late life depression was reported to be 104 per 1000 risk years.(49) Social isolation was significantly associated with the risk of developing depression. The prevalence of depression ranged from 7.4% reported in Nigeria(56) to 37.8% in Ghana(50) and 40% in South Africa(55). All these studies were on community-dwelling individuals. Risk factors were advanced age, undernutrition, poor socio-economic circumstances, lack of children and female gender.(54) Poor self-rated health and chronic pain, in particular chest pain, was also associated with depression. Loss of a spouse was a notable risk factor for depression (55), and also for suicidal

ideation. New suicidal ideation occurred in 4% of elderly Nigerians and was most commonly associated with death or separation of a spouse. (52) Twenty percent of these proceeded to plans and 6% to attempts.

People with major depressive disorder were found to have poor quality of life and impaired physical and mental functioning. (48) Tomita et al. 2013 deduced that untreated late-life depression was associated with lower functioning. (43) This could be attributable to ill-health negatively influencing mood, or depression directly impairing daily functioning. There was also a significant association between depression and poor nutrition. (51) The social factors associated with an increased risk of depression included social isolation, low household income, not having children, the loss of a spouse and living in a less-developed area.

Despite the high prevalence rates reported in these studies, the majority of people over 60 years with depressive symptoms went undiagnosed and undertreated.(48) Mental health screening was recommended as part of routine health screening in the elderly.

Falls

Three of the studies reporting on falls originated in South Africa (61, 62, 65), three from Nigeria(58, 60, 63), one from Malawi(59) and one from Rwanda(64). The prevalence of falls, as reported in eight studies, ranged between 23% and 26%. Recurrent falls were also highly prevalent.

Poor cognitive functioning was a significant predictor of falls.(59, 62). Other factors associated with falls were chronic pain, insomnia, dizziness, foot problems, self-reported cardiovascular disease, previous falls and poor urine control.(60, 62, 64). Elderly females were more likely to have indoor falls and sustain injuries such as fractures, than men who tended to have falls outdoors. (60, 64)

Sarcopaenia and Nutrition

Adebuyose et al.2018 estimated the prevalence of sarcopaenia among Nigerian clinic attendees above 60 years to be 5.4%. Sarcopaenia was associated with sedentary lifestyle, use of medication, malnutrition, cognitive impairment and poor self-rated health.(66) Older persons with malnutrition in the study had 5.8 times greater risk of developing sarcopenia than those with normal nutrition. Nutritional disorders were highly prevalent in the study population; 7.8% of participants had undernutrition and 54.1% were overweight. Other studies in South Africa(71) and Nigeria(67, 69) also found a high prevalence of overweight and obese elderly, especially among females. Being overweight increased the risk of hypertension, cardiovascular disease and arthritis. Under-nutrition was associated with advancing age, and linked to gastrointestinal disorders.(66) The elderly are at higher risk of malnutrition due to multi-morbidities and decreased oral intake. Adebosoye et al. 2018 identified constipation, rectal bleeding and oral problems to be associated with under-nutrition.(67) Even in South Africa, where those over 60 years received a state pension, more than half of participants were reportedly malnourished or at risk for

malnutrition.(71) The high prevalence of obesity, despite low food security was associated with the affordability of carbohydrate-rich food.

Frailty

Two studies in this review investigated frailty in the SSA geriatric population. Both were conducted in Tanzania.(77, 78) Lewis et al. 2018 looked at the prevalence of frailty in community dwelling older adults aged 60 years and older using the Comprehensive Geriatric Assessment (CGA).(78) The reported prevalence of 19.1% is comparable to other populations. The prevalence increased with age and was more common in women. Gray et al.2017 devised and applied a 40-item Frailty Index(FI) to people aged 70 years and older in Tanzania.(77) In both studies this frailty index, named the Brief Frailty Instrument for Tanzania (B-FIT) was used to screen for frailty, and was found to correlate well with the Frailty Index. Among the elderly in Tanzania, a higher frailty index score was significantly correlated with greater age, never having attended school, falls, mortality, and functional impairment.

Sensory impairment

Three studies from Nigeria(73, 74, 76) and one from South Africa(75) described sensory impairments among older adults. The prevalence of blindness and visual impairment, in particular, was noted to be high. Adegbehingbe et al. 2006 found that the majority of participants older than 60 years (71.2%) had some form of visual impairment.(73) Overall, there were 5.6% who were bilaterally blind while 45.4% were visually impaired according to the WHO definition of blindness and visual impairment. Cataracts, glaucoma and uncorrected aphakia were the leading causes of blindness while 80% of visual impairment was due to cataract alone. Studies on disability in Zimbabwe(35) and Nigeria (44) added further evidence of the high prevalence of visual impairments among older adults, and a strong association between visual impairment and care dependency. Treatable causes of blindness, such as cataracts, were reportedly neglected, resulting in avoidable disability.

Hearing impairment was also common. Govender et al. 2014(75) and Lasisi et al. 2010(76) found the prevalence of hearing impairment to be associated with advancing age. In the South African study, 56% of the participants reported trouble hearing, while in the Nigerian study the prevalence of hearing impairment was reported at 6.4%. Hearing impairment was significantly associated with conditions such as previous suppurative otitis media, head injury and hypertension. Most elderly could not afford or had no access to a hearing device.

Musculoskeletal disorders

Two studies, one from Kenya(79) and one from Botswana(80), reported on musculoskeletal conditions among the aged. The prevalence of musculoskeletal pain in two of more sites among people aged 60 years and older in Botswana was reported to be 68% by Clausen et al.(80) In a study by Aboderin et al.2017 in an urban slum in Kenya, musculoskeletal conditions emerged overall as the single most severe health problem reported.(79) This study, conducted among people over 60 years, found the prevalence of

past month back pain to be 44% and past 2 week symptoms of arthritis was 42.6%. Lower back and knee pain were the most common sites for activity limiting musculoskeletal pain. Female gender, unemployment and hypertension were associated risk factors for back pain and symptoms of arthritis.

Data from other included studies also identified musculoskeletal conditions as highly prevalent among older adults. Musculoskeletal disorders were implicated in the aetiology of depression and was noted to be a significant contributing factor to poor quality of life.(53) Although pain conditions were associated with incident disability, there was no association between chronic pain and disability.(42). A significant outcome was poor self-reported health.

Discussion

Despite the rapidly aging population in SSA, there is a dearth of documented research on age-related health conditions among people aged 60 years and older in sub-Saharan Africa (SSA). With the notable exceptions of the Ibadan study on ageing and the 10/66 Dementia group, there has been scanty funding and resources dedicated to research geriatric populations in SSA. Another factor for the scarcity of publications on people over 60 years is that researchers still categorize people over 50 years, rather than above 60 years, as old.(3) Thus many studies originating from the World Health Organization's multi-country Study on global AGEing and adult health (WHO SAGE) study were omitted from this review as data specific to people aged 60 years and older could not be extracted.(81)

Only twelve of the countries in sub-Saharan Africa contributed to this review. Included studies reported on samples as small as 98 participants up to studies with sample sizes of 2232, and were mostly representative of community dwelling older adults. However, the results may not be generalizable to all geriatric populations in SSA, as the populations reported on were from a few countries and from diverse settings; ranging from traditional rural communities to residents of urban slums. Some eligible studies may have not been identified due to use of specific keywords in the search. No quality appraisal was conducted as the study objective was to map research activity around age-related health conditions among geriatric populations in SSA. Hence, the validity and reliability of results cannot be commented on.

This review included publications describing cognitive and functional impairments, mental health and neurological disorders, falls, sarcopenia and nutritional disorders, frailty and musculoskeletal disorders. The prevalence of age-related health conditions, such as dementia and falls, among geriatric populations in SSA was reported to be comparable to that in high-income countries(HIC). The lower prevalence rates of dementia reported among the oldest old i.e. 80 years and older, could be ascribed to low survival rates of people with dementia in the SSA region. Dementia was noted as a high mortality risk among the elderly in several studies.(27, 29, 32) The finding of accelerated weight loss in those with incident dementia is of potential clinical value to health workers working with geriatric populations. Although dementia cannot be cured, community education and screening programmes could help identify people

in the early stages of dementia so that patients and families could plan and prepare in order to minimize the burden of disability.

There were significant associations reported between functional impairment and depression, sensory impairments and undernutrition, suggesting a synergist effect of age-related disorders on the aetiology of disability. Many modifiable risk factors for geriatric morbidity were identified such as hypertension, depression, chronic pain disorders and sensory impairments. However, these conditions were under-diagnosed and undertreated by health care providers. The majority of older adults had little access to cataract surgery and hearing aids. The consequence of this was care dependencies, depression and impaired quality of life. Health professionals working with older adults need to be cognisant of this and have a low threshold for treating hypertension and later-life depression, rather than consider it a normal part of ageing. Social isolation and loss of a spouse was significantly associated with depression and suicidal ideation. Organised social activities, as seen in traditional communities, reduced the risk of depression, dementia and suicidal ideation. Changes in traditional African society, with urbanisation and dissolution of extended family structures, may see the prevalence of depression increase in SSA populations.

Few studies included this review investigated sarcopenia, falls and frailty in the SSA geriatric community. These conditions have been extensively researched in high-income populations, but there is little evidence of the prevalence, associated factors and outcomes of these conditions in people older than 60 years living in SSA. In particular, research around the development and validation of frailty screening tools is lacking.

Although undernutrition is commonly associated with aging, studies in this review revealed an alarmingly high prevalence of obesity, especially among elderly females. This highlights the need for education in geriatric populations around dietary choices and weight management. Encouragement of physical activity could mitigate the onset of sarcopenia as well as preserve physical functioning.

Complex interactions between age-related health conditions, such as dementia and depression, highlight the need for health service providers to offer a comprehensive and function-orientated service to geriatric people. Health policy makers should consider restructuring health services to address some avoidable causes of geriatric morbidity identified in this review. Knowledge and understanding of the complex morbidity in elderly patients would better equip primary care providers to address their needs. This will require an urgent review of health professions training in geriatric care competencies.

Conclusions

The body of empiric research and evidence on age-related health conditions in geriatric people in SSA remains small. Publications included in this review centre around functional impairment and psychogeriatric conditions, with a few studies describing falls, sensory impairment, frailty and musculoskeletal conditions in this population.

The prevalence of several age-related health conditions were reported among SSA geriatric populations and were estimated to be comparable to that in high-income countries(HIC). There was a large unmet need for health and social services among geriatric communities in sub-Saharan Africa. Lack of access to hearing aids and cataract surgery contributed to care dependencies. Many elderly with functional impairments lacked care-givers. Depression and dementia were poorly identified and managed in the geriatric community, also resulting in avoidable morbidities and mortality. Greater awareness and education is required, especially among primary care providers, on dementia, disability and later-life depression. The provision of assistive walking and hearing devices in primary care would help avoid some of the adverse health effects resulting from sensory impairments. Greater social support should be mobilized for those elderly that have lost family members. In these studies, routine nutritional and functional assessment in geriatric populations is recommended as a cost-effective strategy to improve the health status and quality of life in the elderly. Resource-constrained settings such as sub-Saharan Africa would benefit from the use of integrated models of care and multi-disciplinary care teams to address the increasing burden of age-related illnesses.

Health professions educators in SSA must align health professions education with the needs of local geriatric populations, taking into consideration the findings of this review. The complex relationships between chronic morbidities in the elderly necessitate a patient-centred approach by primary healthcare providers who work with people older than 60 years. Knowledge and understanding of age-related conditions should be addressed, as well as attitudes towards the aged, and interprofessional care and collaboration. Extension of health and social services into communities is also essential to reverse negative perceptions towards ageing and encourage appropriate utilization of health services. Health services in sub-Saharan Africa needs to include improved awareness and attitudes towards the elderly.

More funding and initiative is required to address geriatric health needs in SSA. Key areas for future health research includes screening and management programs for geriatric syndromes in people over 60 years in SSA, and health professions education in geriatric care.

Declarations

Ethics approval and consent to participate - not applicable

Consent for publication – The authors consent to publication of this study

Availability of data and material – Database searches are available on the BMC repository

Competing interests: The author has no conflict of interest.

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Authors' contributions – KN & JW conceptualised the study and developed the protocol. KN, JW and UKZN Systematic Review Service conducted the review. KN drafted the manuscript and JW contributed to the completed manuscript. All authors have read and approved the manuscript.

List of abbreviations

SSA- sub-Saharan Africa

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Tables

Table 1. Electronic database search

DATE OF SEARCH	ELECTRONIC DATABASE	KEYWORDS SEARCHED	NO. OF STUDIES RETRIEVED	NO. OF STUDIES SELECTED
03/07/19	Web of Science	"older adult" AND "health" AND "sub-Saharan Africa"	3580	87
03/07/19	PubMed	"older adults" OR "geriatric" AND "health" AND "sub-Saharan Africa"	3123	224
03/07/19	Biomed Central	"older adult" or "geriatric" AND "sub-Saharan Africa"	3573	22
08/07/19	Worldcat Dissertations (Sabinet)	"older adult" OR "geriatric" OR "aged" AND "sub-Saharan Africa"	43	6
08/07/2019	Academic search complete	"older adult" AND "health" AND "sub-Saharan Africa"	364	50

Table 2- Distribution of studies by area of geriatric health

	CONDITION	NO.	REFERENCES
1	Cognitive disorders	17	(17-33)
2	Disability or functional impairment	12	(34-45)
3	Mental & neurological disorders	12	(46-57)
4	Falls	8	(58-65)
5	Sarcopaenia and nutrition	7	(66-72)
6	Sensory impairments	4	(73-76)
7	Frailty	2	(77, 78)
8	Musculoskeletal disorders	2	(79, 80)
TOTAL :		64	

Figures

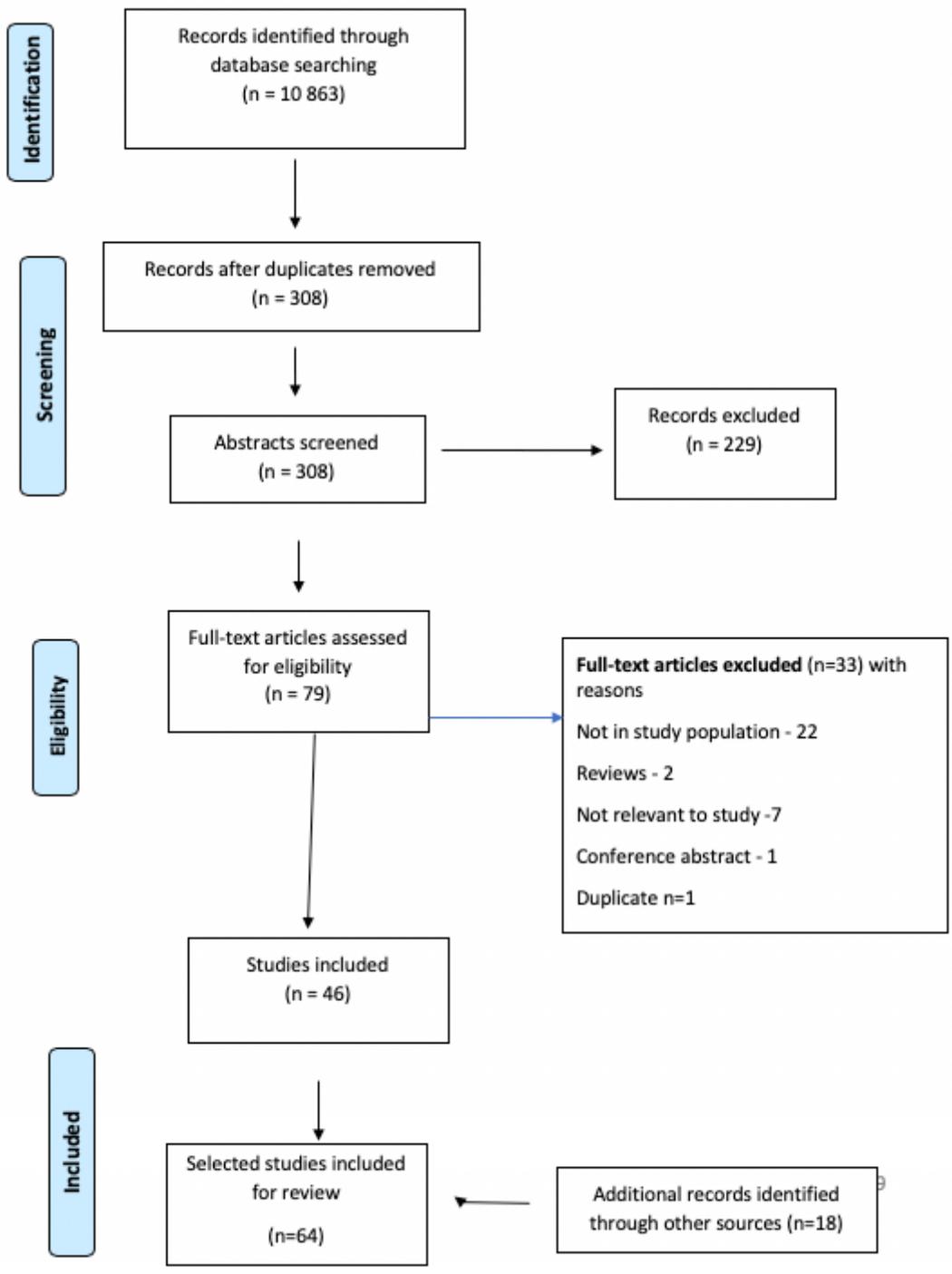


Figure 1

Flow diagram of study selection process

FIGURE 2. NUMBER OF PUBLICATIONS PER COUNTRY

POPULATION BASED STUDIES SSA



COUNTRY NUMBER OF STUDIES

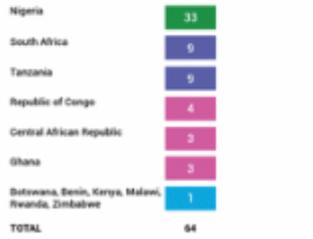


Figure 2

Number of publications per country

Supplementary Files

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- [AppendixA.docx](#)
- [PRISMA ScR checklist1.docx](#)
- [ELECTRONIC DATABASE SEARCH 2019.docx](#)
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