African Journal of Emerging Issues
Peer reviewed | Double blind | Interdisciplinary
African Journal of Emerging Issues (AJOEI)
Online ISSN: 2663 - 9335
Available at: https://ajoeijournals.org
INFORMATION SCIENCE

EVALUATION AND UTILIZATION OF HEALTH INFORMATION SOURCES AND CHANNELS BY ELDERLY INDIVIDUALS IN INFORMAL SETTLEMENTS

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January 2026

ABSTRACT

This study sought to examine how elderly individuals living in Nairobi's informal settlements access, evaluate, and utilize health information, in contexts where poverty, infrastructural deficits, and low digital literacy exacerbate health vulnerabilities. Grounded in Giddens' Aging Theory and Maslow's Basic Needs Theory, the research highlights how structural barriers, socio-economic hardship, and limited technological access constrain older adults' ability to obtain, interpret, and apply health information. Evidence indicates that elders predominantly rely on interpersonal networks, traditional media, and community health volunteers, while formal and digital channels remain underutilized due to affordability, accessibility, and trust deficits. A Systematic Literature Review (SLR) was conducted following PRISMA guidelines to synthesize evidence on elderly health information access in informal settlements. Structured searches across Scopus, Web of Science, ProQuest, Google Scholar, and ScienceDirect were complemented by grey literature from WHO, HelpAge International, and Kenya's Ministry of Health. Studies included addressed older adults' health information needs, exhibited methodological rigor, and applied to informal settlement contexts. Both qualitative and quantitative research published between 2018 and 2025 were reviewed, alongside foundational theoretical works. Methodological quality was appraised using established SLR frameworks to ensure robustness, transparency, and replicability. The findings revealed persistent barriers such as low digital literacy, dependence on informal social networks, and limited engagement with formal health communication channels. Multi-channel strategies, including radio, community health volunteers, intergenerational digital mentorship, and vernacular-language materials, enhanced comprehension, trust, and utilization of health

information. Empirical gaps remain regarding the comparative effectiveness of formal versus informal sources, the role of trust, and the impact of digital inclusion interventions. By framing health information access as fundamental to survival, autonomy, and dignity, this study recommends evidence-based insights for age-sensitive interventions. Policymakers and health planners should implement culturally tailored, multi-channel communication strategies that integrate formal and informal sources, leverage community health volunteers, expand intergenerational digital mentorship programs, and provide accessible formats including vernacular languages, audio-visual materials, and large print to overcome literacy and sensory barriers. Embedding these strategies within slum health policies can enhance trust, uptake, and ultimately, healthy ageing among marginalized older adults in resource-limited urban environments.

Key Words: *Elderly Individuals, Informal Settlements, Health Information*

1. INTRODUCTION

Elderly individuals living in informal settlements experience significant constraints in accessing, understanding, and utilising health information due to poverty, weak infrastructure, and low digital literacy. Recent studies show that structural and environmental deprivation in slum settings sharply limits older adults' exposure to formal health communication and reduce their ability to navigate health systems. A global scoping review finds that infrastructural deficits, low literacy, and fragmented health services significantly undermine access to health information for slum residents (Park et al., 2022). Research in Nairobi further demonstrates that residents of informal settlements, particularly older adults, experience barriers such as overcrowding, limited availability of health facilities, and socioeconomic hardship that restrict their access to reliable health information (Otieno et al., 2020). Access to trustworthy health information is a critical determinant of healthy ageing, yet in low-income settlements such access is undermined by limited resources, insecure living environments, and weak health-communication structures, contributing to vulnerability and preventable adverse health outcomes (Attafuah et al., 2023; Weimann et al., 2019). As a result, elderly residents remain highly susceptible to misinformation, late diagnosis, and functional decline, particularly when digital literacy and technological access are limited (Lu et al., 2024).

Growing evidence indicates that the intersection of ageing and slum residence produces multidimensional health disadvantages. In sub-Saharan Africa, a scoping review found that older adults residing in informal settlements experience higher burdens of chronic disease, functional limitations, and poorer self-reported health than the general population, largely due to infrastructural deficits and limited access to health services (Gómez Olivé et al., 2020). Similarly, research in Kenya and Ghana shows that many older persons in informal urban areas lack essential health knowledge and often rely on informal social networks rather than verified medical sources for health information (Attafuah et al., 2023; Njenga, 2025). Evidence from South Asia reinforces this pattern: in India, low education levels and poor community health infrastructure contribute to inadequate health awareness and high multimorbidity among older adults in urban slums (Yogesh et al., 2024), while in Bangladesh, elderly slum dwellers face significant barriers such as cost, distance, and limited digital literacy, impeding access to reliable health information (Uddin et al., 2022). Across these contexts, infrastructural challenges, low digital skills, and socioeconomic hardship further hinder older adults' ability to engage effectively with mobile and digital health platforms (Njenga, 2025).

The evidence on older adults in informal settlements and their access to health information remains patchy and geographically limited (e.g., Thailand, Kenya), and there is currently no robust, global evidence base specifically targeting older slum-dwellers. In some slum and informal settlement contexts, older adults, particularly those who are poor, have low education, or lack digital access, experienced digital and informational exclusion during the COVID-19 pandemic. For instance, in a Bangkok slum community, elderly residents were less likely than younger residents to access online COVID-19 information (Pattanasri et al., 2022). Similarly, among elderly slum dwellers in Kenya, many relied on traditional media and interpersonal networks (radio, phone, WhatsApp) rather than formal or institutional channels to obtain health information (Njenga, 2025). More broadly, among older adults with disabilities during the pandemic, internet non-users were significantly more likely to report difficulties in acquiring COVID-19 information and protective resources (Kim & Cho, 2024). Given these concerns, this research area remains significantly underexplored. Existing literature tends to focus on younger or general slum populations, leaving a substantial knowledge gap regarding how elderly individuals specifically interact with, access, and evaluate health information. Understanding these dynamics is critical for the development of age-sensitive, context-appropriate health communication strategies. Therefore, this study is necessary to address emerging gaps in knowledge and contribute to a more inclusive understanding of health information access in informal settlements.

Statement of The Problem

The elderly population in Nairobi's informal settlements faces multifaceted challenges in accessing and utilizing essential health information. Age-related declines in physical, cognitive, and social functioning increase older adults' dependence on timely, accurate, and actionable health information to maintain autonomy, functional independence, and overall well-being (Wilunda & Stewart Williams, 2015; Ayako et al., 2025). In slum contexts, older adults frequently exhibit limitations in functional health, including mobility, cognition, and general ability to carry out daily tasks which are strongly associated with diminished quality of life and greater need for health support (Mutisya & Ngware, 2022). Despite this heightened need, many older adults in Nairobi's slums experience poverty, low literacy, and digital exclusion, which severely constrain their ability to obtain, interpret, and apply health knowledge effectively (Njenga et al., 2024; Shams-Ghahfarokhi, 2025). Studies of elderly slum dwellers in Nairobi have found that most rely on interpersonal communication, radio, and television for health information, with very limited use of online media due to lack of digital literacy and access (Njenga et al., 2024).

Current health communication strategies and information delivery systems inadequately address the unique needs, preferences, and capacities of this demographic. Media use among the elderly is shaped by factors such as self-efficacy, health literacy, attitudes, and socio-economic status (Shams-Ghahfarokhi, 2025). As a result, older adults often rely on informal and potentially unreliable sources, perpetuating misinformation and increasing vulnerability to preventable health conditions (Otieno et al., 2020). The problem is further exacerbated by structural and environmental barriers inherent to informal settlements, including inadequate healthcare infrastructure, poor sanitation, insecurity, and low socioeconomic status (Otieno et al., 2020). Technological interventions, while globally recognized as effective tools for information dissemination, remain largely inaccessible to older adults in these contexts due to limited device ownership, low digital health literacy, physical impairments, and mistrust or discomfort with online sources (Shams-Ghahfarokhi, 2025; Njenga, 2025; Kim & Cho, 2024).

Despite numerous studies on aging in Kenya that emphasize social and economic dimensions, limited empirical attention has been given to how elderly individuals in informal settlements access, evaluate, and utilize health information sources and communication channels. This gap limits the development of evidence-based policies and interventions aimed at improving the accessibility, relevance, and credibility of health information for marginalized older adults. Consequently, this study sought to evaluate the health information sources and channels available to elderly individuals in Nairobi's informal settlements, examine how these sources are utilized, and identify barriers influencing effective access and use of health information.

Purpose of the Study

This paper sought to examine the utilization and evaluation of health information sources by elderly individuals in their daily lives.

2. LITERATURE REVIEW

Theoretical Review

This paper was grounded on Giddens' Aging Theory and supported by the Basic Needs Theory.

Giddens' Aging Theory (2006)

Giddens' aging theories, developed by Giddens (2006) and expanded by Higgs and Gilleard (2023), explain aging as both a biological process and a socially constructed phenomenon shaped by economic, political, and historical contexts. The functionalist perspective emphasizes role loss in older age, which may limit social participation and engagement with health-promoting activities (Rowe & Kahn, 1997; Fries, 2002). In informal settlements, structural and socioeconomic constraints further reduce opportunities for older adults to attend outreach programs or engage with formal health providers, limiting access to reliable information (Otieno et al., 2020; Wambiya et al., 2021).

Giddens' framework also highlights the cumulative effects of lifelong inequalities on aging outcomes, with older adults who have low education, poor employment histories, or limited income facing additional barriers to health and digital literacy, restricting their ability to navigate institutional or online health information platforms (Wilunda et al., 2015; Wandera et al., 2015). Consequently, many elders rely on informal networks, family members, peers, or community health workers for guidance, which may vary in accuracy (Wilunda et al., 2015). The structural-institutional dimension underscores how societal systems, including healthcare infrastructure, policy frameworks, and urban planning, shape ageing experiences (Giddens, 2006; Higgs & Gilleard, 2023). In Nairobi's informal settlements, inadequately equipped clinics, unsafe neighbourhoods, and limited outreach programs directly reduce opportunities for older adults to access timely and accurate health information (Lilford et al., 2017; Otieno et al., 2020). Giddens' framework further emphasizes the interaction between individual agency and structural constraints; even when older adults actively seek information, environmental and institutional barriers, such as unsafe roads, poor transport, and limited digital access, mediate their ability to obtain and act on knowledge (Nutbeam, 2018; Wilunda et al., 2015). This perspective aligns with concepts of successful ageing and quality of life, integrating physical, mental, and social well-being in later life (Rowe & Kahn, 1997; Higgs & Gilleard, 2023). Structural disadvantages, including overcrowding, poor sanitation, and environmental hazards, not only limit access to

health information but also diminish overall quality of life, highlighting the importance of systemic interventions alongside individual behaviour change (Otieno et al., 2020; Kabir et al., 2022).

Methodologically, Giddens' framework cautions against attributing deficits in health information access solely to individual failings. It emphasizes examining how older adults' agency intersects with structural constraints, encouraging researchers to incorporate environmental, policy, and institutional factors in studies of health literacy and information access (Mberu et al., 2019; Kabir et al., 2022). Overall, Giddens' aging theories provide a robust conceptual lens for understanding health information access among elderly residents in informal settlements, supporting a multidimensional approach to intervention and policy design that accounts for both systemic and individual determinants.

The Basic Needs Theory

The Basic Needs Theory, developed by Abraham Maslow (1943), explains human motivation as a hierarchical process in which lower-level needs must be satisfied before higher-level psychological and self-fulfillment needs can be pursued. The hierarchy includes physiological needs (food, water, health), safety needs (security, stability, access to services), love and belonging needs (social connections), esteem needs (recognition and self-respect), and self-actualization (personal growth and fulfillment) (Maslow, 1943; Lester & Lester, 1998). For older adults, unmet foundational needs such as health, nutrition, and safety can suppress engagement with social, cognitive, or self-development goals.

Empirical research demonstrates the relevance of Maslow's theory to ageing populations. Zhang et al. (2022) developed quality indicators for long-term care of older adults, illustrating that satisfying physiological and safety needs is foundational to achieving social engagement, esteem, and cognitive well-being. Similarly, Song and Peng (2020) linked need satisfaction to subjective well-being in older adults, showing that deficits in basic health, nutrition, or safety significantly reduce life satisfaction and overall functioning. These findings underscore the importance of addressing basic survival and safety needs to enable higher-order psychosocial engagement among older adults.

In informal settlements, older adults face acute resource scarcity, overcrowding, and limited access to healthcare services, jeopardizing their basic physiological and safety needs (Kabir et al., 2022; Otieno et al., 2021). Health information, such as guidance on disease prevention, nutrition, hygiene, and available health services, directly supports the fulfillment of these lower-level needs. Without access to accurate health information, older residents are less able to maintain physical health or secure their personal safety, increasing vulnerability to illness and functional decline. Maslow's framework further suggests that once basic needs are met, older adults can engage in higher-level needs. For example, access to community health programs or peer education sessions enables social belonging and fosters esteem through active participation in health decisions (Nabbumba et al., 2020; Erondu et al., 2021). Consequently, health information access functions not only as a survival tool but also as an enabler of social integration and empowerment among elderly residents.

The hierarchical model also justifies focusing on health information as a fundamental need rather than an optional service. In informal settlements, where poverty, neglect, and infrastructural deficiencies are prevalent, ensuring access to health information is critical to preserving life, autonomy, and dignity (Mberu et al., 2019; Wamukoya et al., 2019). Critics of Maslow, however,

note that the hierarchy may not always be strictly linear; older adults can pursue higher-order needs even when some lower-level needs are partially unmet, though unmet basics generally constrain psychological well-being (Lester & Lester, 1998). This nuance is particularly relevant in informal settlements, where elders may exhibit resilience and participate in social or educational activities despite ongoing deprivation, highlighting adaptive coping mechanisms alongside structural constraints.

The Basic Needs Theory provides a conceptual lens for designing health interventions targeting older adults in marginalized urban contexts. By framing access to health information as a fundamental requirement for physiological and safety security, policymakers and practitioners can prioritize resources, outreach, and digital literacy initiatives that directly address basic survival needs before promoting broader social or cognitive engagement (Nutbeam, 2018; Kyobutungi et al., 2020). Maslow's theory complements structural and aging frameworks, such as Giddens' aging theories (Giddens, 2006), by linking individual well-being with social and environmental determinants. It highlights that information access is not merely an educational or technological challenge but a core enabler of survival, safety, and overall quality of life for elderly populations in informal settlements (Lilford et al., 2017; Abu-Ali & El-Sayed, 2021). Integrating Maslow's hierarchy into health communication and urban planning strategies allows interventions to systematically address the layered needs of older residents, promoting both physical health and psychosocial empowerment.

Empirical Review

Health Information for The Elderly

Access to health information is a fundamental determinant of well-being among older adults, particularly in informal settlements where structural, socioeconomic, and digital barriers intersect to limit knowledge acquisition. As life expectancy rises, ageing populations face complex health challenges that necessitate reliable, timely, and accessible information. Health information underpins functional independence, disease management, preventive care, and psychosocial well-being, forming a crucial element of quality of life in later years (Otieno et al., 2020; Wambiya et al., 2021; Nanyonga et al., 2023). In low-resource urban contexts, older adults often confront multiple barriers, including poverty, low literacy, limited mobility, and restricted access to digital technologies, which constrain their ability to obtain, interpret, and act upon health knowledge (Mberu et al., 2019; Wilunda et al., 2015). This section reviews the needs, sources, access, information-seeking behaviors, and perceptions of health information among elderly populations, emphasizing the experiences of residents in informal settlements.

Needs for Health Information Among the Elderly

The health information needs of older adults are inherently diverse, encompassing clinical, preventive, psychosocial, and system-navigation dimensions. Functional independence, which includes physical mobility, cognitive capacity, and social engagement, is a key determinant of well-being in ageing populations. Declines in these domains are associated with increased dependency, diminished productivity, psychosocial stress, and a heightened need for targeted health information to maintain autonomy and quality of life (Beard et al., 2022; Nanyonga et al., 2023; WHO, 2023). In informal settlements, the prevalence of chronic conditions such as hypertension, diabetes, respiratory illnesses, and musculoskeletal disorders amplifies the need for accessible, evidence-based health information. Older adults require guidance on early detection, disease management,

medication adherence, and preventive practices to mitigate the impact of these conditions (Beard et al., 2022; Mberia & Kimani, 2024). The high burden of comorbidities in slum environments, compounded by overcrowding, poor sanitation, and limited healthcare access, further intensifies the demand for practical health knowledge.

Beyond clinical needs, older adults seek information on nutrition, physical activity, mental health, and stress management to sustain functional autonomy. Studies in Nairobi and other Kenyan informal settlements reveal that elderly residents actively seek guidance on maintaining healthy diets, engaging in age-appropriate exercise, managing stress, and adopting coping strategies to preserve independence (Mberia & Kimani, 2024; Mutiso & Wambugu, 2024). These needs highlight the multidimensional character of elderly health information, extending beyond biomedical concerns to encompass lifestyle and psychosocial well-being. In addition, elderly populations in sub-Saharan Africa require knowledge of available social support mechanisms, including community-based programs, welfare benefits, and pension schemes. Information on such services helps mitigate vulnerabilities stemming from social and economic marginalization, allowing older adults to plan for healthcare expenditures and sustain their livelihoods (Nanyonga et al., 2023; UN DESA, 2023). The absence of reliable information in these domains often contributes to social exclusion and reduced engagement in community life.

The COVID-19 pandemic underscored the critical consequences of information deficits for older adults. Misinformation on vaccines, treatment options, and public health guidelines disproportionately affected elderly populations due to low digital literacy, limited online access, and skepticism toward rapidly disseminated information (Beard et al., 2022; WHO, 2023). In response, organizations such as WHO and HelpAge International emphasized tailored health literacy campaigns, using radio, community meetings, and trusted intermediaries to ensure accurate and culturally relevant information reaches older adults (HelpAge International, 2023).

Research further highlights that elderly individuals prioritize actionable, understandable, and contextually relevant information. For instance, guidance on diet modifications, safe physical activity, and medication management is valued over abstract biomedical advice that lacks practical application (Eastman, 2024; Mberia & Kimani, 2024). This underscores the importance of not only disseminating information but ensuring it is tailored to older adults' cognitive, educational, and environmental contexts, particularly in low-resource urban settings.

Sources of Health Information

Health information for older adults is accessed through a combination of formal and informal channels, each playing a distinct but complementary role. Formal sources include public health facilities, hospitals, government agencies, and international organizations such as WHO and HelpAge International (Walaba, 2024; WHO, 2023). These institutions provide evidence-based guidance on chronic disease management, vaccination, mental health, preventive care, and health system navigation. In Kenya, community health volunteers act as critical intermediaries, translating medical guidance into culturally and linguistically accessible formats, conducting home visits, and supporting adherence to treatment and preventive regimens (Mutiso & Wambugu, 2024; Eastman, 2024).

Formal channels, however, are often constrained by structural and systemic challenges. Limited staffing, long waiting times, and insufficient infrastructure reduce the accessibility and quality of health communication for older adults (Njenga, Mogambi, & Oriaso, 2024). Additionally, negative

attitudes among healthcare staff, financial barriers, and the physical inaccessibility of facilities, especially in informal settlements, diminish the likelihood that elderly individuals will seek or act on information provided by formal sources (Mberia & Kimani, 2024). Informal sources, including family members, neighbors, peers, and religious or community leaders, play a critical role in low-resource settings, often supplementing or substituting formal channels (Awuor & Onyango, 2022; Nanyonga et al., 2023). Intergenerational dialogue within households serves as a vital conduit for health knowledge, with younger family members translating new guidance into actionable practices for elders. Similarly, trusted community figures provide reassurance, interpret technical information, and validate health messages, which is particularly important in contexts where older adults may distrust institutional or digital sources (Rees & Bath, 2020; Kimotho & Wambui, 2023).

Mass media and digital platforms are increasingly central to health information dissemination. Studies in Nairobi's informal settlements show that elderly residents access health content through radio, television, phone calls, WhatsApp, SMS, Facebook, and websites to monitor chronic conditions, follow nutrition advice, and adopt mental well-being practices (Njenga et al., 2024). Multi-channel approaches have been linked to improvements in diet, exercise, medication adherence, and engagement in preventive behaviors, demonstrating the potential for media to reinforce both formal and informal health information networks (Glenton, 2022; ITU, 2025). Despite these opportunities, structural and technological barriers constrain digital engagement. Low device ownership, unreliable electricity, limited internet connectivity, and digital illiteracy reduce the accessibility of online health resources for older adults in informal settlements (Njenga et al., 2024; Eastman, 2024). Cognitive challenges, sensory impairments, and unfamiliarity with technology further exacerbate disparities, highlighting the need for tailored interventions that address usability and comprehension (Glenton, 2022).

Moreover, the interplay of formal, informal, and media sources underscores the necessity of integrated communication strategies. Research shows that elderly individuals are most responsive to information when multiple channels reinforce the same messages, particularly when informal trust networks validate formal guidance (Mberia & Kimani, 2024; Rees & Bath, 2020). For instance, radio programs supplemented by community health volunteers and peer support groups enhance understanding and adherence more effectively than any single channel alone. Cultural relevance and linguistic accessibility are also critical determinants of uptake. Older adults are more likely to engage with information delivered in local languages, using culturally familiar analogies or examples, rather than abstract biomedical terminology (Kowal et al., 2020; Mutiso & Wambugu, 2024). This underscores the importance of designing health communication that is not only accurate but also contextually appropriate for elderly populations in low-resource urban settings.

Access to Health Information

Access to health information is multidimensional, encompassing availability, affordability, usability, and trustworthiness (Darnton, 2025; WHO, 2023). In informal settlements, physical and structural barriers significantly hinder older adults' ability to obtain health information. Long distances to clinics, poor road networks, unsafe pathways, and high transport costs restrict mobility, limiting exposure to formal health education campaigns and direct consultations (Mutiso & Wambugu, 2024; Kabir et al., 2022). Overcrowded and poorly serviced housing further compounds these challenges by reducing opportunities for private consultations or community-based health discussions. Sensory and cognitive impairments, including reduced vision, hearing, and memory decline, also diminish the effectiveness of conventional print media, signage, and

posters, making standard health communication less accessible to elderly populations (WHO, 2023; Eastman, 2024). Low literacy levels prevalent among older residents of informal settlements further reduce comprehension, even when information is physically available, emphasizing that mere presence of information does not guarantee meaningful access (Nanyonga et al., 2023).

Age, context, and cultural factors shape communication preferences. Older adults tend to favor face-to-face interactions, interpersonal networks, and community-based engagements over digital platforms or impersonal print materials (Awuor & Onyango, 2022; Mberia & Kimani, 2024). Community health volunteers, peer educators, religious leaders, and local elders serve as trusted intermediaries, translating health messages into accessible, culturally appropriate formats. In sub-Saharan African informal settlements, radio programs, vernacular-language brochures, and community meetings have proven particularly effective in reaching older adults, providing actionable guidance even in the presence of literacy and digital barriers (Njenga et al., 2024; Rees & Bath, 2020).

Social support networks play a pivotal role in mediating access. Older adults embedded in supportive family structures or community organizations are more likely to receive, trust, and act upon health information. Conversely, elders who are socially isolated or economically disadvantaged often experience restricted information flow and limited engagement with health services (Eastman, 2024; Beard et al., 2022). Intergenerational support, particularly when younger family members or community volunteers assist with information interpretation and technology use, has been shown to enhance comprehension and uptake of health messages.

Digital and mobile technologies are increasingly relevant, though access remains uneven. Smartphone ownership among adults over 60 in sub-Saharan Africa has increased significantly, facilitating access to SMS-based health reminders, WhatsApp support groups, telemedicine consultations, and online health resources (ITU, 2025; Glenton, 2022). Yet, digital literacy, device availability, cognitive challenges, and mistrust of online information continue to constrain effective use. Targeted interventions, including intergenerational digital mentorship programs, simplified mobile interfaces, and culturally adapted content, are essential to bridging the digital divide and enhancing equitable access.

Universal design principles have emerged as a practical approach to improving information accessibility. Strategies such as large-print materials, audio-visual resources, translation into local languages, and use of culturally familiar analogies increase comprehension and engagement among older adults with diverse literacy, sensory, and cognitive capacities (WHO, 2023; Mutiso & Wambugu, 2024). Implementing these measures across formal and informal channels ensures that older adults in marginalized contexts are not excluded from critical health information. Trustworthiness and credibility of sources also affect perceived access. Older adults are more likely to engage with information delivered through familiar, culturally respected intermediaries rather than anonymous digital platforms or distant institutions (Kowal et al., 2020; Mberia & Kimani, 2024). Combining trusted interpersonal channels with formal health messaging enhances uptake and reduces susceptibility to misinformation.

Information-Seeking Behaviour

Information-seeking behaviour refers to purposeful and deliberate actions undertaken by older adults to identify, access, evaluate, and utilize health information to meet their physical, mental, and social needs (Wilson, 2020). This behaviour is a critical determinant of health literacy, self-

management, and overall well-being, particularly in contexts where formal healthcare services are limited. Elderly individuals commonly seek guidance on chronic disease management, nutrition, physical activity, mental health, medication adherence, and preventive care (Bruce, 2025; Nanyonga et al., 2023). In informal settlements, interpersonal sources dominate the information-seeking landscape. Older adults rely primarily on health workers, community health volunteers, family members, peers, and religious leaders rather than digital or formal written sources, reflecting patterns of trust, cultural norms, and low digital literacy (Awuor & Onyango, 2022; Eastman, 2024). Intergenerational dialogue within households serves as a key mechanism through which health knowledge is transmitted and contextualized, ensuring that elders can act on information in ways that align with their lived realities (Nanyonga et al., 2023).

Research increasingly demonstrates that older adults are exhibiting greater agency and proactive engagement in seeking health information. In Kenya and Uganda, studies report that elders attend community health workshops, participate in local health talks, and directly request advice from community health workers, signaling a transition from passive recipients of information to active participants in health management (Walaba, 2024; Nanyonga et al., 2023). This shift is associated with enhanced self-efficacy, reduced dependency on caregivers, and improved adherence to preventive and therapeutic measures.

Technological innovations have emerged as important enablers of information-seeking. Mobile health (mHealth) interventions, including SMS reminders, WhatsApp-based health groups, telemedicine consultations, and mobile alert systems, facilitate timely access to critical health information, especially for chronic disease management (ITU, 2025; Glenton, 2022). Intergenerational digital mentorship programs, in which younger family members or volunteers guide elders in using smartphones and digital health platforms, have been shown to improve confidence, reduce technology-related anxiety, and expand access to verified health content.

Participatory approaches to health information design further enhance engagement. When older adults are actively involved in co-creating health content, including the format, language, and delivery mode, studies indicate higher satisfaction, comprehension, and behavioral uptake (WHO, 2023; Mberia & Kimani, 2024). Such approaches not only empower elders but also ensure that health messages are culturally appropriate, contextually relevant, and actionable within informal settlement environments.

Despite these advances, persistent barriers continue to constrain information-seeking behaviour. Mobility limitations, sensory impairments (vision and hearing loss), cognitive decline, low literacy, and financial constraints restrict elders' ability to access and act upon health information effectively (Mutiso & Wambugu, 2024; Eastman, 2024). Structural challenges, such as inadequate community health infrastructure and overcrowded living conditions, exacerbate these difficulties, emphasizing the need for targeted, context-sensitive interventions.

The literature also highlights the importance of trust and credibility in shaping information-seeking behaviour. Elders are more likely to seek and act on advice from trusted intermediaries, such as community health volunteers or religious leaders, than from unfamiliar or impersonal digital sources (Kowal et al., 2020; Njenga et al., 2024). Addressing misinformation and reinforcing the reliability of available channels are therefore essential components of effective health communication strategies in informal settlements. From the context, it is evident that the information-seeking behaviour among older adults in informal settlements is multifaceted, contextually shaped, and influenced by interpersonal, technological, and structural factors.

Enhancing access, digital literacy, participatory engagement, and trustworthiness of sources can empower elders to manage health proactively, maintain autonomy, and improve overall quality of life (WHO, 2023; Nanyonga et al., 2023). Strategic interventions must therefore integrate formal, informal, and digital channels while addressing physical, cognitive, and socio-economic barriers to optimize information-seeking outcomes.

Perceptions of Information Access

Older adults perceive access to health information as central to dignity, autonomy, and social participation, linking it closely with their ability to make informed health decisions and maintain independence (Ahn, 2024). In informal settlements, however, structural inequities, poverty, low literacy, and marginalization significantly constrain both actual and perceived access to information (Kimotho & Wambui, 2023). Consequently, elders often rely on informal sources, such as family members, peers, and local community figures, which, despite potential gaps in accuracy, are considered trustworthy and culturally relevant.

Cultural and social norms strongly shape perceptions of access. In many African contexts, elderly populations prioritize interpersonal advice from community elders, faith leaders, and health workers over impersonal digital or printed media (Mberia & Kimani, 2024). Trust in these familiar sources enhances comprehension and the likelihood of acting on the information, even when formal health services are underutilized. Conversely, digital mistrust remains prevalent among older adults, with online platforms often viewed as unreliable, confusing, or inaccessible due to technical complexity, low digital literacy, and exposure to misinformation (Eastman, 2024; Njenga et al., 2024).

Perceptions of access are further influenced by the quality, clarity, and cultural relevance of communication channels. Health information that is contextually adapted, delivered in local languages, and visually or audibly accessible is more positively perceived by elders, reinforcing trust and engagement (WHO, 2023). For example, community health volunteers translating medical advice into simple language or conducting home visits in informal settlements significantly enhance elders' confidence in their ability to understand and act on the information.

Government and NGO initiatives play a critical role in shaping perceptions of access. Programs such as Kenya's Community Health Strategy (2022–2030) and Ajira Digital for Seniors, which integrate multi-channel communication approaches, including radio, vernacular-language materials, peer educators, and digital platforms, improve both the actual and perceived availability of health information (Ministry of Health, Kenya, 2024). Such interventions increase the visibility of credible information, reduce reliance on unverified informal sources, and promote positive attitudes toward health literacy. Positive perceptions of access have significant implications for engagement and health behavior. When elders believe that information is trustworthy, comprehensible, and actionable, they are more likely to participate in health programs, seek preventive care, manage chronic conditions effectively, and make autonomous health decisions (WHO, 2023; Mberia & Kimani, 2024). Perception, therefore, acts as both a psychological and practical enabler of health empowerment in ageing populations.

Barriers to positive perceptions often overlap with structural and digital inequalities. Limited device ownership, intermittent electricity, poor infrastructure, and lack of accessible health facilities can lead elders to perceive health information as unattainable, even when interventions exist. Social isolation, mobility constraints, and cognitive impairments further exacerbate these challenges, reinforcing a sense of exclusion from formal health systems (Mutiso & Wambugu,

2024). Evidence suggests that building trust, integrating culturally appropriate communication, and leveraging familiar social networks are essential strategies to enhance perceptions of health information access. Elders who perceive information as relevant and reachable demonstrate greater willingness to apply it in daily life, fostering independence, well-being, and active participation within their communities (Rees & Bath, 2020; WHO, 2023).

Conceptual Model

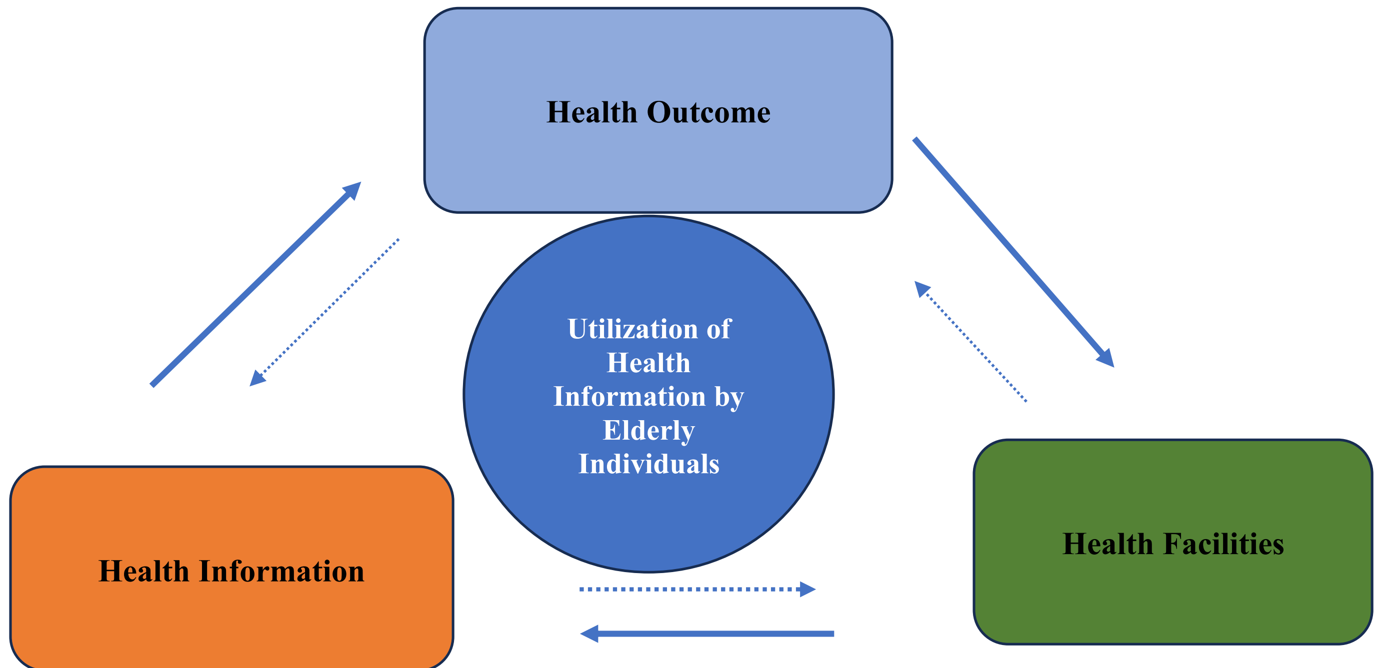

Fig 1: Recursive relationships between Need, Access and Utilization of Health Information

Source: Author (2025)

3. RESEARCH METHODOLOGY

This study adopted a Systematic Literature Review (SLR) to examine how elderly individuals in informal settlements access, evaluate, and utilize health information through formal, informal, and media channels. The SLR was selected for its methodological rigor, transparency, and replicability, which are critical for synthesizing evidence across diverse contexts and ensuring reliable conclusions (Tranfield et al., 2003; Agazu & Kero, 2024). A structured search was conducted across multiple academic databases, including Scopus, Web of Science, ProQuest, Google Scholar, and ScienceDirect, using targeted keywords such as "health information access," "elderly," "informal settlements," "information-seeking behavior," and "health literacy." Grey literature, including government reports, NGO publications, and policy briefs from organizations such as WHO, HelpAge International, and Kenya's Ministry of Health, was included to address evidence gaps in low-resource and marginalized urban settings (Petticrew & Roberts, 2006).

The review followed PRISMA guidelines, screening studies published between 2018 and 2025, while also considering foundational theoretical works on ageing, health literacy, and information access (Nutbeam, 2018; Giddens, 2006; Maslow, 1943). Screening criteria included relevance to older adults' health information needs, methodological rigor, and applicability to informal settlement contexts. Both qualitative and quantitative studies were included to capture a comprehensive view of elderly information behaviors, access barriers, and utilization patterns.

Methodological quality of included studies was assessed using SLR appraisal frameworks (Kitchenham & Charters, 2007), with attention to study design, sample representativeness, data collection techniques, and clarity in reporting outcomes. This ensured that synthesized findings were robust, reliable, and could inform evidence-based recommendations for improving health information access among older adults in low-resource urban settings.

The synthesis highlighted multiple dimensions of health information access. Studies consistently demonstrated that elderly individuals in informal settlements face structural barriers, low digital literacy, reliance on informal social networks, and limited access to formal health communication channels (Kabir et al., 2022; Awuor & Onyango, 2022). Evidence also indicated the effectiveness of multi-channel communication strategies, including radio, community health volunteers, intergenerational digital mentorship programs, and vernacular-language materials, in improving comprehension, trust, and utilization of health information (Njenga, 2025; Glenton, 2022).

Empirical gaps were identified in understanding the comparative effectiveness of formal versus informal sources, the role of perceived trustworthiness, and the impact of digital inclusion interventions on information utilization among elderly populations. These gaps underscore the need to contextualize global evidence within specific socio-economic and infrastructural conditions prevalent in informal settlements of sub-Saharan Africa (Nanyonga et al., 2023; Mberia & Kimani, 2024). Overall, the SLR provides a systematically synthesized, theoretically grounded, and empirically informed foundation for examining how elderly individuals access, evaluate, and utilize health information in resource-limited urban settings. By integrating both formal and informal evidence, the study informs strategies for improving health literacy, promoting preventive behaviors, and supporting autonomy and well-being among older adults in informal settlements.

4. DISCUSSION

Access to health information is a critical determinant of older adults' functional independence, quality of life, and capacity for self-care in informal settlements. Empirical evidence underscores that health information access is shaped by a complex interplay of structural, social, and technological factors. Formal sources including hospitals, community health centers, government programs, and international agencies such as WHO and HelpAge International—play a central role in providing validated guidance on disease management, preventive care, nutrition, mental health, and social support (Otieno et al., 2020; Wambiya et al., 2021). These sources are essential for enabling informed decision-making, early diagnosis, and adherence to treatment regimens. However, studies show that physical access, affordability, and literacy constraints limit their effectiveness, particularly in congested and underserved informal settlements (Kabir et al., 2022; Otieno et al., 2020).

Informal sources are equally important in shaping elderly health knowledge. Family members, peers, religious leaders, and neighbors often serve as primary conduits of information in contexts where formal channels are inaccessible, under-resourced, or mistrusted (Anyango et al., 2023; Nanyonga et al., 2023). Intergenerational communication within households and community

networks allows elders to interpret, contextualize, and act upon health information. Evidence from Kenya, Ghana, and Tanzania indicates that trust and social proximity often outweigh the perceived credibility of formal institutions, suggesting that informal networks are indispensable for the diffusion of actionable health knowledge (Kowal et al., 2020). Nonetheless, overreliance on informal sources can perpetuate misinformation or incomplete guidance, highlighting the need for harmonization with verified formal channels.

Media platforms like radio, television, mobile phones, and social media are emerging as significant sources of health information. In Nairobi's informal settlements, older adults engage with radio programs, WhatsApp, SMS, television, and Facebook to monitor chronic conditions and access advice on nutrition, physical activity, and mental health (Njenga et al., 2024). Radio and television remain particularly effective for reaching low-literacy populations, while mobile platforms provide real-time alerts, telemedicine consultations, and peer support networks. Despite these advantages, barriers such as limited electricity supply, low smartphone ownership, and digital illiteracy constrain their uptake (Glenton et al., 2022; ITU, 2025).

Information-seeking behavior among elderly individuals is an active process encompassing deliberate efforts to acquire, interpret, and utilize health information for self-care, disease prevention, and social participation (Wilson, 2020). While traditional reliance on interpersonal sources persists due to trust and familiarity, recent studies indicate a positive shift toward proactive engagement. Older adults in Kenya and Uganda attend community health workshops, request personalized advice from health workers, and participate in local health education sessions, demonstrating a transition from passive recipients to active seekers of information (Otieno et al., 2020; Nanyonga et al., 2023). The degree of information-seeking is strongly mediated by education, socioeconomic status, digital literacy, and accessibility of trusted channels.

Technological innovations increasingly facilitate information-seeking among elderly populations. Mobile health (mHealth) interventions such as SMS reminders, teleconsultations, and digital mentorship programs improve access to timely, actionable health guidance, particularly in chronic disease management (Glenton et al., 2022; ITU, 2025). Participatory design approaches, where older adults co-create health content, have been associated with higher comprehension, satisfaction, and adherence to recommended practices (WHO, 2023). Nonetheless, cognitive decline, sensory impairments, and mobility limitations remain persistent barriers, emphasizing the need for inclusive, adaptive, and culturally sensitive interventions.

Access is multidimensional, encompassing not only the availability of information but also affordability, usability, relevance, and trustworthiness (Darnton, 2025). Elderly individuals' preferences for communication modes are shaped by age, literacy, and social context. Face-to-face interactions, peer educators, community health volunteers, and radio programming in local languages have proven most effective for those with limited literacy or digital skills (Anyango et al., 2023; Mberia & Kimani, 2024). Social support networks further moderate access: elders with family, neighbors, or community-based support are more likely to trust, comprehend, and act upon health information, whereas isolated or economically disadvantaged individuals remain underserved (Eastman, 2024).

Perceptions of information access critically influence utilization. Older adults link access to health information with dignity, autonomy, and social participation, viewing it as essential for self-care and informed decision-making (Ahn, 2024). Structural inequities, low literacy, poverty, and marginalization reduce perceived accessibility, while trust in sources and cultural appropriateness

shape engagement. In African contexts, interpersonal advice from family, community elders, faith leaders, and health workers is often prioritized over digital or printed sources (Mberia & Kimani, 2024). Digital mistrust is common, with elders perceiving online information as unreliable or technically complex (Eastman, 2024). Multi-channel initiatives such as Kenya's Community Health Strategy (2022–2030) and Ajira Digital for Seniors have demonstrated success by integrating vernacular-language materials, peer educators, and community outreach to enhance both perceived and actual access (Ministry of Health Kenya, 2024). Positive perceptions of access are strongly linked to improved health behaviors, functional independence, and social participation (WHO, 2023).

The integration of formal, informal, and media channels demonstrates that effective health information access is a multidimensional, context-sensitive process. Formal structures provide validated guidance, informal networks ensure social trust and relevance, and media platforms expand reach and timeliness. Evidence suggests that older adults achieve better health literacy, self-efficacy, and functional autonomy when these channels are effectively combined and contextually adapted (Njenga et al., 2024; Glenton et al., 2022).

Theoretical frameworks provide explanatory insight into these dynamics. Giddens' Aging Theory emphasizes that structural inequalities, institutional arrangements, and individual agency collectively shape information-seeking behavior (Giddens, 2006). Maslow's Basic Needs Theory situates health information as a fundamental requirement for fulfilling physiological and safety needs, forming the basis for autonomy, social participation, and self-actualization in older adults (Maslow, 1943). Together, these frameworks underline the importance of considering both individual initiative and structural facilitation in interventions designed to improve health information access and utilization (Nanyonga et al., 2023; WHO, 2023).

Despite advancements, key research gaps remain. Most studies are cross-sectional, focus on self-reported metrics, and do not examine longitudinal health outcomes or sustained behavior change. Limited attention has been paid to the moderating effects of socioeconomic conditions, digital literacy, social support, and institutional backing on information access. Future research should adopt longitudinal and mixed-method approaches to capture sustainable health literacy outcomes, evaluate channel effectiveness, and explore the mediating and moderating factors that influence utilization.

Elderly health information access in informal settlements depends on the strategic integration of formal health systems, trusted informal networks, and adaptive media channels. Facilitating autonomy, functional independence, and well-being requires multi-channel, culturally sensitive, and inclusive interventions that address literacy, mobility, and technological barriers. Policymakers and practitioners should prioritize community engagement, digital literacy initiatives, and infrastructural support to ensure equitable and sustainable access to health information for aging populations in resource-constrained urban settings.

Bridging Health Information Gaps among the Elderly in Informal Settlements: A Critical Necessity

Structural and Environmental Constraints

The built environment of informal settlements severely limits older adults' ability to access and use health information. In Nairobi's slums, only a small fraction of households has reliable piped water, and sanitation facilities are often shared or in poor condition, creating significant health and

mobility risks for the elderly (Otieno et al., 2021; Nkanata et al., 2020). These structural deficits constrain opportunities for in-person outreach or community-based health education, as older individuals may be reluctant or physically unable to move frequently, particularly when living in cramped, unsafe, or poorly serviced housing.

Overcrowding in informal settlements also limits privacy and space for health consultations, reducing opportunities for direct engagement with health educators (Corburn & Sverdlik, 2017). Narrow alleys, uneven pathways, and flood-prone areas further restrict the elderly's ability to reach clinics or community centres, effectively isolating them from critical health information (UN-Habitat, 2022). Research in Kibera found that older residents often travel long distances to access basic health services, limiting their exposure to health promotion campaigns (Kabir et al., 2022).

Environmental hazards, including poor air quality, contaminated water, and inadequate waste management, compound the health risks for elderly residents (Lilford et al., 2017; UN-Habitat, 2022). These hazards increase the prevalence of infectious diseases such as diarrhoea, tuberculosis, and respiratory infections, making timely access to health information crucial. Yet, the same environmental constraints reduce the likelihood that older adults will seek preventive guidance or engage in health literacy activities (Abu-Ali & El-Sayed, 2021).

In addition to physical barriers, informal settlements often lack functional community health structures. Public health posts are scarce, poorly equipped, or located at unsafe distances from older residents' homes, limiting face-to-face information dissemination (Mberu et al., 2019; Kabir et al., 2022). Studies indicate that where health services exist, older adults report long waiting times, discrimination, or limited communication from staff, further discouraging engagement with formal health information sources (Kyobutungi et al., 2020; Wamukoya et al., 2019).

Poverty compounds structural barriers. Older adults living in slums typically have low or irregular income, limiting their ability to pay for transport to clinics or purchase mobile devices needed for digital health information (Wamukoya et al., 2019; Nkanata et al., 2020). The intersection of environmental hazards and poverty means that older residents often prioritize immediate survival needs over health-seeking behaviours or information acquisition. The lack of public infrastructure also reduces the visibility and frequency of health promotion campaigns. Posters, leaflets, or community workshops are rarely accessible in congested areas, and even when present, low literacy levels among older adults reduce comprehension (Nabbumba et al., 2020; Eastman, 2024). Consequently, informal settlements perpetuate a cycle of structural disadvantage where the very conditions that heighten health risks simultaneously restrict access to preventive information.

Studies in similar contexts across Sub-Saharan Africa show that elderly residents in slum-like environments consistently report lower engagement with formal health systems and information campaigns compared to younger residents (Okoye & Onwujekwe, 2021; Nanyonga et al., 2023). These findings suggest that structural interventions, such as safe pathways, reliable sanitation, and proximate health posts, are critical for improving health information access. Furthermore, the interplay between structural barriers and social marginalization intensifies the vulnerability of older adults. Without safe community spaces or networks for knowledge sharing, older residents are more likely to rely on informal channels, which may perpetuate misinformation and reduce the effectiveness of public health initiatives (Erondu et al., 2021).

Finally, addressing structural and environmental constraints requires integrated urban planning and public health strategies. Research suggests that slum upgrading programs, coupled with community health outreach, can improve access to health information and overall health outcomes

among elderly residents (Harling et al., 2021; UN-Habitat, 2022). Effective interventions must therefore consider both physical infrastructure and tailored communication strategies to reach older adults in marginalized settings.

Reliance on Informal Providers and Low Health Literacy

Low health literacy among elderly individuals in informal settlements significantly influences their reliance on informal healthcare providers, often with negative implications for health outcomes (Nutbeam, 2000; Sørensen, Knoll, Ramos, Boateng, Alemayehu, Schamberger, & Harsch, 2024). Health literacy refers to the capacity to obtain, process, and understand basic health information to make appropriate health decisions. In slum settings, older adults frequently lack the education, cognitive support, and resources required to navigate formal healthcare systems effectively (Kyobutungi et al., 2010; Park, Wazaify, & Khatri, 2022). Informal providers, including traditional healers, community health volunteers, unlicensed drug shops, and faith-based practitioners, are often more accessible, affordable, and familiar to elderly residents (Watson et al., 2021). Research in Nairobi's Kibera and Mathare slums reveals that older adults frequently consult herbalists or local drug vendors as first-line care, bypassing formal health facilities entirely (Kyobutungi et al., 2010; Park et al., 2022). This reliance is shaped by both structural barriers, such as long distances to clinics and prohibitive transport costs, and low literacy, which impedes comprehension of formal medical guidance.

Economic constraints reinforce dependence on informal providers. Many elderly slum residents live on fixed or irregular incomes, limiting their ability to afford clinic fees, laboratory tests, or prescribed medications (Onwujekwe et al., 2010). Consequently, the perceived affordability and flexible payment arrangements offered by informal practitioners make them an attractive alternative, even if the services are less regulated or evidence-based (Watson et al., 2021). Trust and familiarity play a central role in shaping healthcare choices. Older adults often have longstanding relationships with informal providers within their communities, creating a sense of cultural and social security (Sørensen et al., 2024). Studies in Bangladesh and Uganda show that elderly slum dwellers are more likely to follow advice from providers they know personally than from formally trained clinicians, whose practices may seem unfamiliar or intimidating (Park et al., 2022; Attafuah et al., 2022).

Low health literacy also limits the ability to critically assess medical advice or detect misinformation. A systematic review in Sub-Saharan Africa found that older adults with limited literacy were more likely to rely on hearsay, anecdotal remedies, or traditional treatments, even for conditions like diabetes, hypertension, or respiratory infections, which require evidence-based care (Salm et al., 2021; Gupta & Bhargava, 2021). In addition, health literacy is closely tied to the ability to use digital health resources. Older adults who struggle with reading, numeracy, or technology are less able to validate information from official sources, and therefore, rely heavily on informal networks for health guidance (Wang et al., 2022; Shi, 2024). This creates a feedback loop where low literacy reinforces dependence on informal providers, while informal sources fail to improve knowledge or promote preventive behaviors.

Caregiving roles further compound the challenge. Elderly individuals often serve as caregivers for grandchildren or chronically ill family members, requiring them to navigate complex health information under stressful conditions (Mberu, 2013; Kyobutungi et al., 2010). Limited literacy makes it difficult to understand medication regimens, vaccination schedules, or disease prevention measures, leading many to seek the quickest, most accessible advice from informal providers.

Social and community dynamics also reinforce reliance on informal providers. Older adults frequently share experiences and advice within peer networks, relying on word-of-mouth guidance rather than formal channels (Das et al., 2024). This communal approach can perpetuate myths or misconceptions about diseases and treatments, highlighting the intersection of literacy, trust, and social influence in shaping health behaviors. Addressing low health literacy and overreliance on informal providers requires integrated strategies. Community-based health education, delivered in local languages and tailored to older adults' cognitive capacities, has been shown to improve comprehension and promote engagement with formal health services (Dong, 2023; Park et al., 2022). Partnerships with trusted informal providers can also serve as a bridge, where these practitioners are trained to disseminate evidence-based information, improving both literacy and care quality (Das et al., 2024).

Policy interventions must prioritize structural improvements alongside literacy programs. Enhancing the availability, affordability, and accessibility of formal health services through mobile clinics, subsidized care, and elder-friendly infrastructure reduces dependence on informal providers while improving health outcomes (Corburn & Ezeh, 2020; Kyobutungi et al., 2010). Strengthening health literacy and integrating informal providers into formal health systems represent essential steps in mitigating health inequities among elderly residents of informal settlements.

Caregiving Roles and Increased Information Needs

The media plays a central role in shaping access to health information among elderly residents of informal settlements. In Nairobi's slums and similar low-resource settings, older adults interact with a range of media platforms including radio, television, mobile phones, messaging/SMS, and social media or other digital media to access health-related information, manage chronic disease, and obtain guidance on hygiene, nutrition, and mental health (Njenga et al., 2024; Wilson et al., 2021). Radio remains one of the most accessible and trusted media among older adults, due to its affordability, familiarity, and ease of use, particularly for those with limited digital skills (Njenga et al., 2024). For many elders, radio-based health segments or vernacular broadcasts serve as culturally appropriate channels for health education and public-health messaging.

Mobile phones, including SMS, voice calls, and simple mobile-based interventions, have emerged as important tools for health communication in resource-constrained settings. However, older adults' ability to benefit from mHealth or mobile-based health messaging is strongly mediated by factors such as digital literacy, socioeconomic status, and social support or family resources (Zhang & Liu, 2024; Sowon & Chigona, 2021). Indeed, a recent systematic review shows that while mHealth holds promise for supporting older persons' health (medication reminders, home-care support), uptake and effectiveness are challenged by technical barriers, age-related constraints, and limited digital literacy (Zhang & Liu, 2024; Wilson et al., 2021).

Social media and other online health-information sources present both opportunities and risks: when older adults use social media, it can improve their access to health information and support e-health literacy, but lower digital literacy and limited ability to critically assess information increase susceptibility to misinformation (Tennant et al., 2025). As a result, health interventions targeting older slum-dwellers should not rely solely on digital media; integration with traditional media (radio), mobile messaging, and interpersonal communication (family, community health workers) remains important. Given the heterogeneity in media access and digital literacy, multi-modal communication strategies, combining radio, simple mobile messaging or calls, community-

based outreach, and, when feasible, supportive digital tools, are likely the most effective and inclusive way to reach elderly residents of informal settlements, improve health information access, and support preventive and long-term care.

Media Use Patterns and Trust in Information Sources

The media plays a central role in shaping access to health information among elderly residents of informal settlements. In Nairobi's slums and similar low-resource settings, older adults interact with a range of media platforms, including radio, television, mobile phones, SMS/WhatsApp, and online portals, to access health-related information and manage chronic conditions (Njenga, 2025; Njenga et al., 2024).

Radio remains one of the most accessible and trusted media for older adults due to affordability, familiarity, and ease of use, especially for those with limited digital literacy (Njenga, 2025; Njenga et al., 2024). Mobile phones and basic digital interactions have also been shown to moderate the negative impact of frailty on quality of life among older adults in Kenya (HWOPs-1 Study, 2025). However, the use of advanced e-health tools remains constrained: many older adults face barriers such as low digital literacy, limited access to technology, and discomfort with apps or the internet (BMC Health Services Research, 2023; JMIR Formative Research, 2025). Social media and online health information sources offer opportunities to improve eHealth literacy, but older adults often prefer simpler, familiar communication platforms, and their ability to evaluate online health content is limited (JMIR, 2025).

Given the heterogeneity in media access, literacy, and social support, a multi-modal health communication strategy, combining traditional media (radio, TV), mobile phones (calls/SMS), and community-based interpersonal networks, is likely the most inclusive and effective way to reach elderly residents with health information (Njenga, 2025; Njenga et al., 2024).

Barriers to Digital Health Engagement

Digital health technologies, including mobile apps, telemedicine platforms, and online health information portals, have the potential to improve access to health information and services for older adults. However, elderly residents of informal settlements face multiple barriers that limit engagement with digital health tools (Njenga, 2025; BMC Health Services Research, 2023). These barriers include technological, cognitive, financial, and social constraints, all of which interact to deepen the digital divide for marginalized older populations.

A primary barrier is low digital literacy. Research in Nairobi slums indicates that many elderly residents have limited familiarity with smartphones, computers, or the internet, reducing their ability to navigate health apps or online health portals effectively (Njenga et al., 2024; HWOPs-1 Study, 2025). Similarly, a study in India reported that older adults often struggle to use mobile health applications due to unfamiliarity with interface design, small fonts, and complex navigation requirements (Gupta & Bhargava, 2021). This gap restricts their ability to access evidence-based health information and participate in digital health interventions. Device ownership and internet access present additional constraints. Many older adults in slum settings do not own personal smartphones or computers, and those who do may rely on shared household devices, limiting privacy and continuity of use (Njenga, 2025; BMC Health Services Research, 2023). High costs of mobile data and intermittent electricity supply further reduce the feasibility of sustained engagement with digital health platforms, particularly among elderly individuals with low or irregular income (Lilford et al., 2017).

Physical and cognitive impairments also affect digital engagement. Age-related vision and hearing loss, memory decline, and reduced motor coordination make it difficult for elderly users to interact with touchscreens or interpret complex digital content (Ssebunya et al., 2021). Research in Kenya and Uganda highlights that these impairments, combined with inadequate assistive technologies, discourage older adults from using telemedicine services or participating in online health education programs (HWOPs-1 Study, 2025; Njenga et al., 2024).

Trust and perceived reliability of digital sources constitute another critical barrier. Older adults often express skepticism toward online health information, fearing scams, misinformation, or inaccurate medical advice (Erondu et al., 2021). Studies in Nairobi slums show that elders prefer information delivered through familiar interpersonal channels, such as community health volunteers or family members, over unfamiliar digital platforms (Njenga, 2025; Njenga et al., 2024). Language and cultural relevance further influence engagement. Many digital health tools are designed in English or other languages that are not the primary language of slum residents, reducing comprehension and usability (Gupta & Bhargava, 2021). Cultural norms also shape health beliefs and technology adoption, with older adults sometimes perceiving digital tools as unnecessary or inappropriate for their needs (BMC Health Services Research, 2023).

Social isolation and limited support networks exacerbate digital barriers. Elderly individuals living alone or with minimal family support often lack guidance on using smartphones or apps, making self-directed digital engagement challenging (Aboderin, 2013). In contrast, older adults embedded in supportive social networks are more likely to receive assistance with technology use, reinforcing the importance of community-based digital literacy interventions (Njenga et al., 2024).

Infrastructure deficits in informal settlements, including intermittent electricity, poor mobile network coverage, and limited public Wi-Fi, create systemic barriers that prevent consistent access to digital health platforms (Lilford et al., 2017; UN-Habitat, 2022). These barriers are compounded by financial limitations, low literacy, and cognitive constraints, creating a layered digital exclusion that reinforces health inequalities among elderly slum residents. Addressing barriers to digital health engagement requires multifaceted strategies. Interventions should combine digital literacy training, provision of affordable devices, community support mechanisms, and culturally appropriate content in local languages (Gupta & Bhargava, 2021; Njenga et al., 2024). Additionally, integrating digital tools with trusted community intermediaries, such as local health workers - can increase trust, adoption, and sustained engagement among older adults in informal settlements (Njenga, 2025).

In conclusion, elderly residents of informal settlements face a complex interplay of technological, financial, cognitive, and social barriers that limit access to digital health information. Comprehensive interventions that combine infrastructure improvement, digital literacy, and community-based support are essential to enhance digital health engagement and reduce information inequities in these vulnerable populations (Njenga, 2025; BMC Health Services Research, 2023; Gupta & Bhargava, 2021).

Improving Health Information Access for the Elderly in Informal Settlements: Strategies and Interventions

Elderly residents of informal settlements face significant structural and environmental barriers, including inadequate sanitation, overcrowding, unsafe pathways, and distant health facilities, which limit access to health information and services (Lilford et al., 2017; UN-Habitat, 2022;

Kabir, Egondi, & Kyobutungi, 2022). Addressing these challenges requires targeted urban interventions, such as slum upgrading programs that enhance sanitation, establish safe pathways, and locate health posts within communities. Integrating health promotion materials into infrastructure initiatives through printed, audio, or visual media can further increase exposure to preventive guidance (Harling et al., 2021).

Low health literacy and reliance on informal healthcare providers exacerbate vulnerabilities among elderly residents (Nutbeam, 2018; Erondu et al., 2021). Community-based education programs delivered in local languages, tailored to cognitive capacities, can improve understanding and engagement with formal health services (Harling et al., 2021; Islam et al., 2022). Training trusted informal providers to deliver evidence-based guidance bridges gaps between formal and informal systems, while policies that enhance affordability, accessibility, and elder-friendly service design, including mobile clinics and subsidized care, reduce dependence on unregulated care sources (Corburn & Ezeh, 2020; Kabir et al., 2022).

Many elderly individuals also serve as primary caregivers, managing the health of grandchildren or chronically ill relatives, which heightens their need for timely, accurate, and comprehensible information (Mberu et al., 2019; Kyobutungi et al., 2011). Interventions such as home-based health education, caregiver support groups, and multi-format materials (audio, visual, or printed) improve knowledge, adherence, and confidence in caregiving tasks. Flexible delivery, including mobile outreach and co-designed programs, ensures accessibility without increasing caregiver burden (Acharya et al., 2020; Islam et al., 2022).

Media and digital technologies offer additional avenues to enhance information access. Radio remains the most accessible and trusted channel, complemented by mobile messaging, television, and social media (Kisia et al., 2020; Valerio, 2023). Multi-modal approaches that integrate media with interpersonal networks such as family, peers, and community health workers, which enhance comprehension, trust, and adoption. Digital interventions require attention to literacy, device ownership, connectivity, and cognitive or physical limitations, while culturally relevant content and support from trusted intermediaries improve engagement and reduce inequities (Gupta & Bhargava, 2021; Islam et al., 2022). Effective strategies must integrate structural, educational, technological, and social approaches. Coordinated policies combining slum upgrading, elder-friendly infrastructure, community health outreach, digital literacy, and financial support offer the greatest potential to improve health information access and overall health outcomes among elderly residents of informal settlements (Corburn & Ezeh, 2020; Harling et al., 2021; Kyobutungi et al., 2011).

5. CONCLUSION

Access to health information among older adults in informal settlements is strongly influenced by media availability and usage patterns. Empirical evidence suggests that radio, television, and mobile phones remain the most accessible and widely used channels for disseminating health-related content in low-resource urban settings (Njenga et al., 2024; Krause & Fletcher, 2023). Radio, in particular, provides both social and informational functions, enabling older adults to engage with community discussions, health campaigns, and emergency alerts, even in contexts of low literacy or limited internet connectivity. Similarly, mobile phones, through SMS, WhatsApp, and voice messaging, have proven effective for delivering reminders, promoting preventive care, and supporting adherence to treatment regimens (Mekonnen et al., 2021). These media channels

are therefore essential components of a multi-platform strategy to ensure timely and actionable health information reaches older populations.

Digital literacy and self-efficacy are critical determinants of older adults' ability to utilize electronic and mobile-based health information. Many older individuals face challenges related to unfamiliarity with technology, limited confidence in navigating digital platforms, and apprehension about misinformation (Wilson et al., 2021). Social support networks, including family members, community health volunteers, and peer groups, play a pivotal role in bridging these gaps. By providing guidance on device use, assisting with content interpretation, and reinforcing trust in credible sources, these intermediaries enhance both access and meaningful comprehension of health information (Njenga et al., 2024). This underscores the importance of combining technological interventions with human support systems to achieve equitable health information access.

Misinformation and the "infodemic" present additional challenges for older adults in urban informal settlements. Social media platforms such as WhatsApp and Facebook are often vectors for unverified health claims, rumors, and misleading advice, which can undermine trust in formal health systems and reduce adherence to recommended care practices (Hove et al., 2023). Older adults, particularly those with limited health literacy, are vulnerable to such misinformation, highlighting the need for targeted interventions that combine media literacy training, culturally tailored messaging, and community engagement. Public health authorities must therefore not only disseminate accurate information but also actively counter misinformation through trusted community channels and consistent messaging.

Structural and systemic barriers also shape the health information environment in informal settlements. Poor infrastructure, overcrowding, and limited availability of healthcare facilities constrain both physical access to providers and exposure to reliable health information (Wilson et al., 2021). Furthermore, economic constraints may limit access to paid media subscriptions or devices, while cognitive and sensory limitations associated with ageing can impede the reception and retention of complex health messages. Addressing these structural factors requires policies that integrate accessible, affordable, and inclusive health communication strategies into urban health planning, ensuring that no subgroup of older adults is left behind.

Finally, participatory and context-sensitive approaches are critical to optimizing the impact of health information interventions. Involving older adults in the design, implementation, and evaluation of health communication strategies ensures that messages are relevant, culturally appropriate, and actionable (Njenga et al., 2024). Community-based programs that combine interpersonal communication, mass media, and digital platforms can simultaneously improve awareness, trust, and practical application of information. By fostering empowerment and agency, these integrated strategies not only support self-care and clinical adherence but also promote social participation, mental well-being, and resilience in ageing populations living in marginalized urban settings.

6. RECOMMENDATIONS

Policy and Practice Implications

The findings of this study underscore the urgent need for comprehensive, multi-level strategies to improve health information access among older adults in underserved or marginalised

communities. Policies should recognize that health information is not merely an ancillary service, but a fundamental enabler of autonomy, functional independence, and social participation among ageing populations. Integrated health communication frameworks that combine formal health services, community intermediaries, and media or digital platforms are therefore essential. Such frameworks must prioritise culturally sensitive and linguistically tailored content, ensuring that health guidance is not only available, but understandable and actionable for older adults (Sundar et al., 2024; Kyaw et al., 2024).

Community engagement emerges as a critical pillar in bridging gaps between formal health systems and older adults. Leveraging trusted local actors, including family members, peer networks, community health workers (CHWs), and social networks, can significantly enhance the credibility and uptake of health information. Intergenerational dialogues and participatory information dissemination, where older adults contribute to the design and delivery of content, can strengthen trust, reinforce relevance, and promote informed decision-making. These approaches also foster social cohesion and may help reduce isolation, supporting broader psychosocial well-being. Evidence suggests that when older adults have adequate social support, smartphone ownership correlates with reduced frailty, mediated by health literacy, underscoring the importance of social support networks in digital health interventions (Lee & colleagues, 2024). Further, community-dwelling older adults express distinct preferences regarding digital health services preferences that highlight the importance of usability, accessibility, and relevance of digital health design to older populations (Hoo et al., 2024).

Digital inclusion represents a promising but challenging avenue to expand the reach of health information, provided it is implemented thoughtfully. Tailored digital literacy programs, intergenerational mentoring, and the development of user-friendly platforms can enable older adults to navigate mobile health applications, telemedicine services, and online health resources. For instance, recent data indicate that higher digital literacy among older adults is associated with healthier behaviours, including better diet and exercise habits, mediated through digital access, information acquisition, and digital application skills (Li, Shao & Gao, 2025). However, digital adoption remains uneven across socioeconomic strata, and barriers such as lack of education, limited digital skills, and device or internet access continue to hamper equitable uptake (Shams-Ghahfarokhi et al., 2025; Shi et al., 2024).

Structural and infrastructural barriers also demand attention, especially in marginalised or low-resource settings. Weak digital infrastructure, limited access to affordable internet or devices, mobility constraints, and poorly designed communication materials may impede effective access to health information. It is well documented that older adults with disabilities are disproportionately affected by the "digital divide", internet non-users among them had greater difficulty obtaining COVID-19 related health information during the pandemic (Kim et al., 2024). Such evidence underscores the need to invest in community-based health centres, outreach clinics, and to develop materials using universal-design principles (e.g. large print, audio-visual aids, vernacular translations), ensuring that older adults, regardless of literacy level, cognitive capacity, or sensory limitations, can access timely and relevant health guidance.

At the same time, capacity building among healthcare providers is fundamental. Training programmes should emphasise geriatric communication skills, cultural competence, and participatory approaches, enabling health workers to deliver information in ways that resonate with older adults. Empirical evidence on older adults' technology adoption shows that acceptance of digital health technologies is influenced not only by perceived usefulness or ease of use, but also

by social influence, trust, and ongoing support, factors that frontline health workers can shape (Anisha, et al., 2025). Without provider support, even well-designed digital interventions may fail to reach or benefit older users.

Institutional and policy-level support is necessary to sustain these interventions. Governments and local authorities, in collaboration with civil society and international organisations, must allocate adequate resources, develop monitoring and evaluation frameworks, and create incentives for inclusive service delivery targeting marginalised elderly populations. Policy instruments should facilitate equitable digital access, support infrastructure development, and promote community-based models that integrate formal health services, social support networks, and technology.

Finally, continuous research and evaluation are required to refine health information strategies and assess their effectiveness. Longitudinal studies capturing both actual and perceived information access, as well as usability and health-outcome impacts of interventions, will be critical. Such evidence-based refinement will enable programs to not only disseminate information but also empower older adults to maintain independence, adopt preventive behaviours, and participate actively in their communities, supporting healthy ageing even in resource-constrained or marginalised environments.

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