



“Closing the Implementation Gap”: Health Literacy Policy Translation and Population Outcomes in Tanzania’s Decentralized Health System

¹Theodori S. Bakari, Mikidadi I. Muhanga², Edwin E. Ngowi³

¹Department of Rural Development and Regional Planning, Institute of Rural Development Planning, Dodoma, Tanzania.

Email: teodorisbakari@yahoo.com

²Department of Development and Strategic Studies, Sokoine University of Agriculture, Morogoro, Tanzania. Email:

mikidadi@sua.ac.tz

³Department of Development and Strategic Studies, Sokoine University of Agriculture, Morogoro, Tanzania. Email:

edwin.ngowi@sua.ac.tz

Received: January 03, 2026; Accepted: June 14, 2026; Published: June 23, 2026

Abstract: Health literacy is fundamental to health promotion, disease prevention, and effective healthcare utilization, yet implementation of health literacy initiatives remains poorly understood in sub-Saharan African decentralized health systems. This study examined implementation effectiveness of health literacy initiatives under Tanzania’s National Health Policy of 2017 in Dodoma Region, addressing the critical evidence gap between policy intentions and community-level outcomes. Using a convergent parallel mixed-methods design, the study employed the Social Ecological Model (SEM) and Consolidated Framework for Implementation Research (CFIR) to assess implementation exposure and health literacy outcomes among 385 community respondents across urban, peri-urban, and rural districts. Quantitative data from household surveys analyzed through multiple linear regression were triangulated with qualitative data from 18 key informant interviews, 6 focus group discussions, and extensive document review. Findings revealed alarmingly low implementation exposure (mean Policy Reach Index=0.12, SD=0.09) and population health literacy (mean Health Literacy Index=21.4, SD=8.7), with 73.8% of respondents demonstrating limited health literacy. Only 23.0% reported recent Community Health Worker (CHW) contact, and 78.4% were unaware of health literacy initiatives. Regression analysis demonstrated that implementation exposure ($\beta=0.38$, $p<.001$), CHW contact ($\beta=0.21$, $p<.001$), and organizational capacity ($\beta=0.29$, $p<.001$) were significantly associated with health literacy outcomes, explaining 42.3% of variance. Educational attainment moderated intervention effectiveness ($\beta=0.19$, $p=.003$), while rural residents derived greater benefit from CHW engagement ($\beta=0.14$, $p=.021$). Qualitative findings identified inadequate financing, absent operational guidelines, weak monitoring systems, donor dependence, and infrastructural constraints as fundamental implementation barriers. The study provides the first empirical evidence linking health literacy policy implementation to population outcomes in Tanzania’s decentralized health system, demonstrating that policy recognition alone cannot generate improvements without institutionalized implementation frameworks, dedicated financing, and robust monitoring systems. Health literacy initiatives remain weakly institutionalized within district health systems despite broader policy commitments. Strengthening implementation frameworks, financing mechanisms, monitoring systems, and CHW-based communication platforms is essential for translating policy intentions into improved population health literacy outcomes. This research contributes to implementation science by operationalizing the pathway from policy to practice in resource-constrained settings.

Keywords: Health policy evaluation; Mixed-methods implementation research; Health system strengthening; Population health outcomes; Tanzania health policy

1.0 Background Information

Health literacy has emerged as a critical determinant of population health outcomes, healthcare utilization, disease prevention, treatment adherence, and overall health system performance globally (Coughlin *et al.*, 2021; Osborne *et al.*, 2022). Defined as the capacity of individuals to access, understand, appraise, and apply health information to make informed health decisions, health literacy also reflects the

ability of healthcare systems to communicate information in ways that are comprehensible and responsive to diverse populations (Fitzpatrick, 2023; Nutbeam & Lloyd, 2020). The World Health Organization (WHO) has positioned health literacy as fundamental to achieving universal health coverage, strengthening disease prevention, promoting health equity, and enhancing health system resilience (WHO, 2022). Empirical evidence consistently demonstrates that



individuals with adequate health literacy are more likely to utilize preventive services, adhere to treatment regimens, effectively manage chronic conditions, and engage in positive health-seeking behaviours (Bindhu *et al.*, 2024; Sørensen *et al.*, 2021). Conversely, limited health literacy is associated with increased healthcare costs, higher hospitalization rates, poorer health outcomes, and widening health inequalities (Shahid *et al.*, 2022).

Despite its recognized importance, health literacy remains a significant public health challenge, particularly in low- and middle-income countries (LMICs) where health systems face resource constraints, weak communication infrastructures, limited community outreach, and unequal access to reliable health information (Niltakan, 2024; Palu, 2022). In many LMIC settings, low educational attainment, shortages of trained health personnel, fragmented communication mechanisms, and inadequate digital infrastructure continue to restrict access to understandable and actionable health information (Murugesu *et al.*, 2022; Spencer *et al.*, 2024). The COVID-19 pandemic exposed and exacerbated these weaknesses through increased health misinformation, vaccine hesitancy, and declining public trust in health information sources, highlighting the critical importance of health literacy for health system resilience and pandemic preparedness (Paakkari & Okan, 2020). Furthermore, rapid expansion of digital health information platforms has introduced new complexities, particularly among vulnerable populations with limited digital literacy and socioeconomic resources (Saimon, 2023). Consequently, health literacy is increasingly understood not merely as an individual competency but as a health system performance indicator and a social determinant of health requiring systematic policy attention (Nutbeam & Lloyd, 2020; WHO, 2022).

Contemporary health literacy research has moved decisively beyond deficit-based models that attribute low health literacy solely to individual limitations in knowledge and skills (Buse *et al.*, 2023; Orcid & Hussein, 2022). Health literacy is now framed as a relational, systemic construct shaped by dynamic interactions among individuals, institutions, communication systems, policy environments, and broader social determinants (Nutbeam & Lloyd, 2020; Sørensen *et al.*, 2021). From this socio-ecological perspective, limited health literacy reflects systemic barriers including fragmented communication pathways, inadequate institutional coordination, poor policy implementation, limited organizational responsiveness, and structural inequities in access to health information (Nutbeam, 2017; Osborne *et al.*, 2022). Health systems thus play a pivotal role in either enabling or constraining health literacy through governance arrangements, institutional capacity, implementation quality, and organizational commitment to health promotion (Osborne *et al.*, 2022; Sørensen *et al.*, 2021). This conceptual evolution has influenced global policy discourse, with

growing international emphasis on building “health-literate systems” that ensure equitable access to information and services across diverse population groups (Sørensen *et al.*, 2021; WHO, 2022).

However, significant knowledge gaps persist regarding the translation of health literacy policy commitments into measurable population-level outcomes, particularly in decentralized health systems of sub-Saharan Africa (Gilson *et al.*, 2018; Passi *et al.*, 2023). While many countries have incorporated health promotion and community empowerment principles within national health policies, evidence regarding implementation processes, institutional determinants, and effectiveness of health literacy initiatives remains remarkably limited (Spencer *et al.*, 2024). The gap between policy intent and implementation practice is especially pronounced in decentralized health systems with constrained resources, where policy recognition often remains largely rhetorical without corresponding operational frameworks, financing mechanisms, monitoring systems, or institutional accountability structures (Ghosh *et al.*, 2021; Shahid *et al.*, 2022). Implementation science research further demonstrates that successful translation of policy into population health outcomes depends on organizational readiness, implementation climate, leadership engagement, resource availability, and robust monitoring systems, rather than policy existence alone (Damschroder *et al.*, 2022; Proctor *et al.*, 2011).

From a theoretical perspective, existing literature reveals limited integration of policy analysis with implementation science frameworks in explaining health literacy outcomes at population level (Damschroder *et al.*, 2009; Mcleroy *et al.*, 1988). While the Social Ecological Model (SEM) provides a comprehensive structure for understanding multi-level influences on health outcomes, it offers limited explanatory power regarding the mechanisms through which policy is translated into practice and why implementation outcomes vary across settings (Mcleroy *et al.*, 1988). The Consolidated Framework for Implementation Research (CFIR) addresses this limitation by distinguishing intervention effectiveness from implementation effectiveness and systematically identifying factors that facilitate or hinder implementation processes across organizational and contextual domains (Damschroder *et al.*, 2009, 2022). However, empirical applications of integrated SEM-CFIR frameworks to examine health literacy policy implementation in LMIC settings remain scarce, representing a significant theoretical gap in the literature.

In Tanzania, health literacy is implicitly embedded within the National Health Policy of 2017 through broad commitments to health promotion, community empowerment, disease prevention, and access to reliable health information (Luvinga & Kessy, 2024). The policy



explicitly prioritizes community participation, institutional collaboration, governance strengthening, and expanded use of mass media and digital technologies for behaviour change communication. Complementary frameworks including the Health Sector Strategic Plan V (2021–2026), the National Community Health Strategy (2020–2025), and the Integrated and Coordinated Community Health Workers Programme (iCCHE, 2024–2028) reinforce community outreach and health education as mechanisms for improving population health (Passi *et al.*, 2023). Despite this supportive policy environment, the 2017 National Health Policy does not define health literacy as a distinct policy objective, nor does it provide implementation guidelines, measurable indicators, dedicated financing provisions, or accountability mechanisms for monitoring health literacy outcomes. Available evidence indicates that health literacy initiatives remain fragmented, poorly coordinated, inadequately financed, weakly monitored, and inconsistently implemented at sub-national levels (Passi *et al.*, 2023; Luvinga & Kessy, 2024). Implementation is further constrained by shortages of trained personnel, weak supervision systems, dependence on donor-funded programmes, uneven digital infrastructure, and competing priorities within resource-constrained health systems.

Dodoma Region provides an appropriate and strategic setting for examining these implementation challenges. As the national administrative capital, the region provides unique insight into how national health policies are translated into local practice across diverse district contexts. The region encompasses urban (Dodoma City Council), peri-urban (Kongwa District), and rural (Chamwino District) settings, reflecting the diversity of Tanzania's decentralized healthcare system and enabling comparative analysis of implementation across varying levels of service accessibility, infrastructure, and community characteristics. However, despite its policy relevance, evidence regarding implementation status, community exposure, institutional determinants, and effectiveness of health literacy initiatives across districts within Dodoma Region remains remarkably limited. This evidence gap constrains the development of context-specific strategies for strengthening health literacy promotion within primary healthcare and community settings, limiting the ability of policy-makers and health system managers to translate policy commitments into measurable population health improvements.

Therefore, this study examined the implementation of health literacy initiatives under the Tanzania National Health Policy of 2017 in Dodoma Region, guided by an integrated theoretical framework combining the Social Ecological Model (SEM) and the Consolidated Framework for Implementation Research (CFIR). The study addressed the critical gap between policy intentions and population-level health literacy outcomes by systematically examining

implementation processes, institutional determinants, and community-level outcomes within a decentralized health system context. Specifically, the study pursued four interconnected objectives: (i) to assess the implementation status of health literacy initiatives at national, regional, and district levels; (ii) to determine levels of implementation exposure, Community Health Worker contact, and health literacy among community members in Dodoma City Council, Kongwa District, and Chamwino District; (iii) to identify individual, institutional, and contextual factors associated with health literacy outcomes among the study population; and (iv) to examine institutional and contextual determinants influencing implementation effectiveness within district health systems.

The study addressed the following research questions: (i) What is the current implementation status of health literacy initiatives under the National Health Policy of 2017 at national, regional, and district levels in Dodoma Region? (ii) What are the levels of implementation exposure, Community Health Worker contact, and health literacy among community members across urban, peri-urban, and rural districts in Dodoma Region? (iii) What individual, institutional, and contextual factors are significantly associated with health literacy outcomes among the study population? (iv) What institutional and contextual determinants facilitate or hinder effective implementation of health literacy initiatives within district health systems?

Henceforth, by addressing these objectives, the study contributes to implementation science and health policy research in three important ways. First, it provides the first empirical evidence linking health literacy policy implementation to population outcomes in Tanzania's decentralized health system, addressing a significant empirical gap in the literature. Second, it operationalizes an integrated SEM-CFIR framework for examining health literacy implementation in resource-constrained settings, contributing to theoretical development in implementation science. Third, it generates evidence to inform policy refinement and strengthen implementation of health literacy initiatives in decentralized health systems, supporting progress toward universal health coverage and health system strengthening in Tanzania and similar LMIC contexts. The findings have implications for health policy development, implementation practice, health system strengthening, and community-based health promotion in resource-constrained settings across sub-Saharan Africa.

2.0 Theoretical Framework

2.1 Introduction to the Theoretical Foundation

This study is grounded in the integration of two complementary theoretical frameworks: the Social Ecological Model (SEM) and the Consolidated Framework



for Implementation Research (CFIR). The use of these frameworks is informed by the complex, multi-level nature of health literacy implementation and addresses a recognized theoretical gap in the literature concerning the limited integration of policy analysis and implementation science in explaining population-level health literacy outcomes in low- and middle-income countries (Damschroder *et al.*, 2009; Mcleroy *et al.*, 1988; Nutbeam & Lloyd, 2020). Health literacy is inherently influenced by interacting factors operating across individual, interpersonal, organizational, community, and policy levels, while the translation of health policy into measurable population outcomes represents a distinct implementation challenge requiring systematic attention to implementation processes, organizational determinants, and contextual factors (Damschroder *et al.*, 2022; Osborne *et al.*, 2022). The integrated framework developed for this study provides a comprehensive analytical structure for examining how policy intentions are translated into implementation activities, how populations are exposed to health literacy interventions, and how these processes influence health literacy outcomes within decentralized health systems.

2.2 The Social Ecological Model (SEM)

The Social Ecological Model, originally developed by Mcleroy *et al.* (1988), explains health outcomes as products of interacting influences operating across multiple levels of the social and physical environment. The model identifies five levels of influence on health behaviours and outcomes: (1) the intrapersonal or individual level, encompassing knowledge, attitudes, beliefs, and skills; (2) the interpersonal level, including social networks, family relationships, and peer influences; (3) the organizational level, comprising formal and informal institutions, rules, and regulations; (4) the community level, involving relationships among organizations, institutions, and social networks within defined geographic areas; and (5) the policy level, encompassing local, regional, and national laws, policies, and regulations (Mcleroy *et al.*, 1988). The SEM has been widely applied in public health research because it provides a comprehensive understanding of how structural, institutional, and social factors shape health outcomes, moving beyond individual-level explanations to account for broader contextual determinants (Nutbeam & Lloyd, 2020; Osborne *et al.*, 2022).

In the present study, the SEM provides the structural basis for situating health literacy within broader ecological systems (Figure 1). At the policy level, the framework focuses on health promotion and health literacy provisions within the National Health Policy of 2017 and complementary health sector frameworks including the Health Sector Strategic Plan V (2021–2026) and the National Community Health Strategy (2020–2025). At the

organizational level, attention is directed toward the institutional capacity, leadership support, communication systems, and implementation climate within Regional Health Management Teams (RHMTs) and Council Health Management Teams (CHMTs). The community level emphasizes the functioning of Community Health Worker (CHW) programmes, community health structures, health facility outreach services, and community-based health communication platforms. The interpersonal level captures household dynamics, peer influences, social networks, and community health worker-client interactions that influence health information sharing and health-seeking behaviours. Finally, the individual level focuses on competencies related to accessing, understanding, appraising, and applying health information for health-related decision-making, measured through the Health Literacy Index (HLI) in this study.

Despite its relevance in identifying multi-level influences on health outcomes, SEM provides limited explanatory power regarding the processes through which policy is translated into practice, the mechanisms by which implementation occurs, and why implementation outcomes vary across settings (Damschroder *et al.*, 2009; Proctor *et al.*, 2011). The model does not explicitly address the organizational readiness, implementation climate, leadership engagement, or contextual factors that determine whether health literacy initiatives are effectively implemented and sustained within health systems. This theoretical limitation is addressed through integration with the Consolidated Framework for Implementation Research.

2.3 The Consolidated Framework for Implementation Research (CFIR)

The Consolidated Framework for Implementation Research, developed by Damschroder *et al.* (2009) and subsequently refined (Damschroder *et al.*, 2022), is an implementation-oriented framework comprising five major domains that influence implementation effectiveness: (1) intervention characteristics, (2) outer setting, (3) inner setting, (4) characteristics of individuals, and (5) implementation process. The framework is particularly suitable for implementation research because it distinguishes intervention effectiveness from implementation effectiveness, enabling systematic analysis of factors that facilitate or hinder policy implementation across diverse contexts (Damschroder *et al.*, 2009; Proctor *et al.*, 2011). CFIR has been widely applied in health services research to examine implementation of complex interventions, health policies, and health system reforms across various settings, including low- and middle-income countries (Damschroder *et al.*, 2022; Ghosh *et al.*, 2021).

Within the present study, the CFIR domains are operationalized as follows. First, intervention characteristics



refer to the design quality, adaptability, complexity, cost, and perceived relative advantage of health literacy initiatives under the National Health Policy of 2017. This domain captures the clarity of policy objectives, availability of operational guidelines, allocation of financial resources, and specification of monitoring indicators for health literacy activities. According to CFIR, intervention characteristics such as adaptability, complexity, and perceived relative advantage influence implementation effectiveness and determine the extent to which policy initiatives can be operationalized successfully (Damschroder *et al.*, 2009).

Second, the outer setting includes broader contextual influences such as alignment with national development priorities, policy environment, external funding landscapes, community needs, and the political, economic, and social contexts within which implementation occurs. Within the study context, the outer setting encompasses Tanzania's national development priorities including the Tanzania Development Vision 2050, health sector strategic plans, donor funding environments, and the broader health policy landscape. Outer setting factors shape the feasibility, acceptability, and sustainability of health literacy implementation (Damschroder *et al.*, 2022).

Third, the inner setting encompasses organizational structures, communication systems, implementation climate, leadership support, resource availability, and readiness for implementation within health facilities and local government health systems. This domain includes the organizational capacity of Regional and Council Health Management Teams, supervision and monitoring systems, inter-departmental coordination mechanisms, staffing adequacy, and the extent to which health literacy is prioritized within routine health system operations. Organizational readiness and implementation climate are considered important determinants of implementation effectiveness (Damschroder *et al.*, 2009, 2022).

Fourth, characteristics of individuals relate to the knowledge, beliefs, competencies, self-efficacy, and motivation of implementers and beneficiaries involved in health literacy initiatives. This domain captures the skills and attitudes of health workers, Community Health Workers, and health managers regarding health literacy promotion, as well as community members' awareness, attitudes, and health literacy competencies (Damschroder *et al.*, 2022).

Fifth, the implementation process includes planning, stakeholder engagement, execution, monitoring, evaluation, feedback mechanisms, and sustainability strategies associated with health literacy interventions (Proctor *et al.*, 2011). This domain captures the extent to which implementation is systematically planned, coordinated, and evaluated, and whether learning and adaptation occur

throughout the implementation process (Damschroder *et al.*, 2022).

2.4 Integration of SEM and CFIR

The integration of SEM and CFIR provides a comprehensive theoretical foundation for examining health literacy policy implementation in decentralized health systems. The integration is justified on both theoretical and empirical grounds. Theoretically, SEM offers a multi-level structure for understanding where determinants of health literacy operate across policy, organizational, community, interpersonal, and individual levels, while CFIR explains the mechanisms through which implementation processes influence outcomes within and across those levels (Damschroder *et al.*, 2009; Mcleroy *et al.*, 1988). The integration is particularly relevant because health literacy is influenced by interconnected policy, organizational, community, interpersonal, and individual factors, while the translation of health policy into measurable health literacy outcomes represents a distinct implementation challenge requiring systematic attention to implementation processes and determinants (Osborne *et al.*, 2022; Sørensen *et al.*, 2021). Empirically, the integration addresses the recognized limitation that health policy studies often neglect implementation processes, while implementation studies often fail to account for multi-level determinants of health outcomes (Damschroder *et al.*, 2022; Gilson *et al.*, 2018).

The integrated framework proposes that improved health literacy outcomes depend on effective implementation of health literacy initiatives across all ecological levels and favourable implementation conditions within CFIR domains (Figure 1). The framework assumes directional relationships among study variables: (1) policy-level inputs and intervention characteristics influence implementation conditions at organizational and contextual levels; (2) supportive implementation conditions including organizational capacity, communication systems, and implementation climate increase population exposure to health literacy initiatives; (3) higher levels of implementation exposure and Community Health Worker contact improve health literacy outcomes among the population; and (4) socio-demographic factors including educational attainment, age, sex, and place of residence moderate the relationship between implementation exposure and health literacy outcomes. Conversely, weaknesses in implementation processes, deficiencies within organizational and policy environments, or unfavourable implementation conditions are likely to constrain implementation effectiveness and limit improvements in population health literacy outcomes.

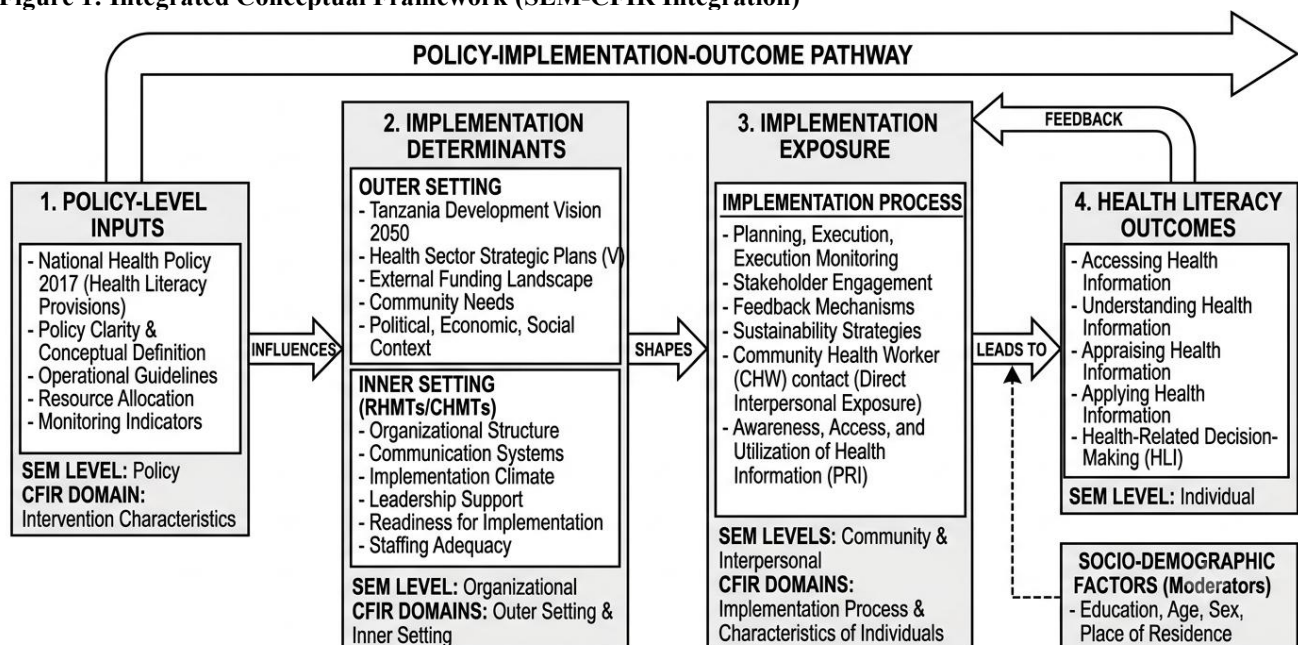
The conceptual framework (Figure 1) operationalizes the SEM-CFIR integration by specifying four interrelated components. The first component comprises policy-level

inputs, corresponding to the SEM policy level and the CFIR domain of intervention characteristics. This component captures the attributes of health literacy initiatives outlined in the National Health Policy of 2017, including clarity of health literacy concepts, availability of operational guidelines, allocation of financial resources, and specification of monitoring indicators (Damschroder *et al.*, 2009; Luvinga & Kessy, 2024). The second component comprises implementation determinants, corresponding to the SEM organizational level and the CFIR domains of inner and outer settings. This component includes institutional and contextual factors that influence implementation across study districts, including organizational structure, implementation climate, communication systems, leadership support, resource availability, and alignment with national development priorities (Damschroder *et al.*, 2022). The third component represents implementation exposure, corresponding to the SEM community and interpersonal levels together with the CFIR domains of implementation process and characteristics of individuals. This component measures the extent to which populations are exposed to health literacy initiatives, operationalized through the Policy Reach Index (PRI) measuring awareness, access, and utilization of health information, and Community Health Worker (CHW) contact measuring direct interpersonal exposure to health education (Passi *et al.*, 2023). The fourth component represents health literacy outcomes at the individual level within the SEM framework, operationalized through the Health Literacy Index (HLI) measuring competencies related to accessing, understanding, appraising, and applying health information (Sørensen *et al.*, 2021).

2.5 Theoretical Contributions and Significance

The integrated SEM-CFIR framework contributes to implementation science and health policy research in several ways. First, it addresses the theoretical gap concerning limited integration of policy analysis and implementation science in explaining population-level health literacy outcomes in low- and middle-income countries (Damschroder *et al.*, 2022; Osborne *et al.*, 2022). Second, it operationalizes the process through which policy intentions are translated into population-level outcomes, enabling systematic empirical examination of the policy-implementation-outcome pathway within decentralized health systems (Proctor *et al.*, 2011). Third, it provides a comprehensive analytical structure for identifying modifiable determinants of implementation effectiveness across multiple levels, generating evidence to inform policy refinement and implementation strengthening (Damschroder *et al.*, 2022; Ghosh *et al.*, 2021). Fourth, the framework assumes that weaknesses at any stage of the implementation pathway, including unclear policy specifications, limited organizational capacity, inadequate implementation processes, or weak monitoring systems, may reduce implementation exposure and subsequently constrain improvements in population health literacy, a proposition consistent with preliminary evidence from the study setting (Passi *et al.*, 2023; Spencer *et al.*, 2024). By providing a theoretically grounded and empirically testable framework, this study contributes to understanding how health literacy policies can be effectively translated into measurable population health outcomes in resource-constrained, decentralized health systems in sub-Saharan Africa.

Figure 1: Integrated Conceptual Framework (SEM-CFIR Integration)



Note: Figure 1 illustrates the integrated Social Ecological Model (SEM) and Consolidated Framework for Implementation Research (CFIR) framework guiding this study. The framework depicts the pathway from policy-level inputs through implementation determinants and implementation exposure to health literacy outcomes, showing the hypothesized relationships among variables across SEM levels and CFIR domains. Source: Authors' conceptualization based on Mcleroy *et al.* (1988), Damschroder *et al.* (2009), and Damschroder *et al.* (2022).



3.0 Methodology

3.1 Description of the Study Area

This study was conducted in Dodoma Region, located in central Tanzania and serving as the national administrative capital. The region was selected due to its administrative significance and its relevance for examining implementation of health literacy initiatives under the National Health Policy of 2017, which emphasises health promotion and community participation within a decentralised health system framework. Dodoma Region is characterised by semi-arid conditions and a predominantly rural population engaged in subsistence agriculture, although increasing urbanisation is evident in Dodoma City Council.

Three districts were included in the study to capture variation in socio-demographic and health system contexts. Dodoma City Council was purposively selected to represent an urban setting with relatively higher administrative capacity and more developed infrastructure. Kongwa District was selected to represent a peri-urban context with mixed access to services. Chamwino District was selected to represent a predominantly rural setting where access to health services is more limited and community-based interventions are more prominent. This selection enabled comparison across different levels of service accessibility, infrastructure, and community characteristics, consistent with approaches used in major Tanzanian health studies to ensure heterogeneous study populations and representative geographical coverage.

3.2 Study Design

This study employed a convergent parallel mixed-methods design as described by Creswell and Clark (2017) to examine implementation of health literacy initiatives under the Tanzania National Health Policy of 2017 in Dodoma Region. The design was considered appropriate because it enabled concurrent collection and analysis of quantitative and qualitative data, thereby providing comprehensive understanding of implementation processes, implementation exposure, and health literacy outcomes within decentralised health systems.

Quantitative methods were used to assess levels of implementation exposure, Community Health Worker (CHW) contact, and health literacy outcomes among community members, while qualitative methods explored institutional, organisational, and contextual factors influencing implementation effectiveness across the study districts. Quantitative data were collected through household surveys, whereas qualitative data were obtained through key informant interviews, focus group discussions, and document review. The study involved community members, Community Health Workers, and district and regional health officials from Dodoma City Council, Kongwa District, and Chamwino District.

Quantitative data were analysed using descriptive and inferential statistical methods, while qualitative data were analysed thematically. Integration of findings occurred during the interpretation stage through triangulation of quantitative and qualitative evidence to enhance validity and provide deeper understanding of implementation dynamics and health literacy outcomes.

3.3 Sampling Procedures and Sample Size

3.3.1 Quantitative Sampling Procedure

A multistage cluster sampling technique was employed for the quantitative component of the study as per Table 1. In the first stage, Dodoma Region was purposively selected due to its administrative significance and its relevance to implementation of the National Health Policy of 2017. In the second stage, three districts, namely Dodoma City Council, Kongwa District, and Chamwino District, were selected to represent urban, peri-urban, and rural contexts, respectively. Subsequently, wards within the selected districts were stratified according to urban-rural classification and selected proportionally to district population size through random sampling procedures.

Villages and streets were thereafter selected using simple random sampling based on official administrative lists. At the household level, systematic random sampling was applied to identify eligible households within the selected

Table 1: Multistage Sampling Procedure for the Quantitative Component

Sampling Stage	Sampling Unit	Sampling Method	Selection Criteria	Number Selected
Stage 1	Dodoma Region	Purposive	Selected as focus area for implementation of Health Policy 2017	1 Region
Stage 2	Districts	Purposive stratified	Representation of urban, peri-urban, and rural settings	3 Districts
Stage 3	Wards	Stratified random	Selected proportionally to district population size	20 Wards
Stage 4	Villages/Streets	Simple random	Selected from official administrative lists	36 Units
Stage 5	Households	Systematic random	Selected using sampling interval from household lists	396 Households (targeted)
Stage 6	Individuals	Kish Grid method	Adults aged ≥ 18 years and resident for ≥ 12 months	385 Respondents



clusters. Finally, one respondent aged 18 years and above was selected from each household using the Kish Grid method. Eligibility criteria required respondents to have resided within the study area for a minimum period of 12 months prior to data collection.

The quantitative sample size was determined using Cochran's formula for cross-sectional studies (Hennink & Kaiser, 2022). The calculation assumed a 50% prevalence of adequate health literacy, a 95% confidence level, and a margin of error of 5%. The estimated sample size was subsequently adjusted to account for design effect and a 10% non-response rate, resulting in a target sample of 396 households. A total of 385 respondents successfully completed the survey.

3.3.2 Qualitative Sampling Procedure

For the qualitative component as indicated in Table 2, purposive sampling was employed to identify key informants with direct involvement in implementation of health policy and health promotion activities. Participant selection was guided by institutional roles and relevance to implementation processes within the health system. The sampling approach ensured representation across multiple implementation levels corresponding to CFIR inner setting domains. Participants included Regional Health Management Team members, Council Health Management Team members, health facility in-charges, and Community Health Worker supervisors.

literacy levels, exposure to health literacy initiatives, and utilisation of community-based health services. Health literacy was measured using the Health Literacy Index (HLI), adapted from the European Health Literacy Survey Questionnaire (HLS-EU-Q47) and contextualised for the Tanzanian setting (Sørensen *et al.*, 2013). Information regarding implementation exposure included awareness, access, and utilisation of health information, including contact with Community Health Workers (CHWs).

3.4.2 Qualitative Data Collection

Qualitative data were collected through face-to-face in-depth interviews using a semi-structured interview guide informed by the study objectives and the Consolidated Framework for Implementation Research (CFIR). Participants included Regional and Council Health Management Team members, health facility in-charges, and CHW supervisors involved in implementation of health promotion activities. Audio recorders and field notes were used during interviews.

Focus group discussions were conducted with community members to explore perceptions of health literacy initiatives, exposure to health information, and experiences with Community Health Worker services. Each focus group comprised 8–12 participants, with discussions facilitated by trained moderators using a topic guide aligned with the study objectives and theoretical framework.

Table 2: Key Informant Interview Sampling Framework and CFIR Representation

Sampling Level	Target Cadre	Sampling Method	Selection Criteria	Number Selected (n)	CFIR Domain Represented
Regional Level	RHMT Members	Purposive	Direct involvement in policy coordination and supervision of health literacy activities	3	Inner Setting: Leadership and Networks
District Level	CHMT Members	Purposive	CHMT Chairpersons, Health Secretaries, and Health Promotion Coordinators from the three districts	9	Inner Setting: Implementation Climate and Readiness
Facility Level	Health Facility In-charges	Purposive	In-charges of high-volume health centres, one per district	3	Inner Setting: Structural Characteristics
Community Level	CHW Supervisors	Purposive	Supervisors overseeing CHW health literacy activities, one per district	3	Characteristics of Individuals: Opinion Leaders
Total			Representation across implementation levels and institutional roles	18	

3.4 Data Collection Methods and Tools

Quantitative and qualitative data were collected using household surveys, in-depth interviews, and document review.

3.4.1 Quantitative Data Collection

Quantitative data were collected through face-to-face interviews using a structured questionnaire administered to household respondents. The questionnaire captured information on socio-demographic characteristics, health

3.4.3 Document Review

Document review was conducted using a document review checklist to examine how health literacy was conceptualised and operationalised within national and district policy frameworks. Reviewed documents included the Tanzania National Health Policy of 2017, Health Sector Strategic Plan V (2021-2026), National Community Health Strategy (2020-2025), Council Comprehensive Health Plans (CCHPs), and Annual Health Sector Performance Reports.



3.4.4 Instrument Validation and Pre-testing

Data collection instruments were pre-tested in a non-study district to assess clarity and contextual appropriateness. Instruments were translated into Kiswahili and back-translated into English to ensure translation accuracy (Brislin, 1970). Data collection was conducted between January and March 2026.

3.5 Data Analysis

3.5.1 Quantitative Data Analysis

Quantitative data were analysed using IBM SPSS Statistics version 27. Prior to analysis, data were cleaned, coded, and examined for completeness, consistency, missing values, and outliers. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were computed to summarise respondents' socio-demographic characteristics, implementation exposure, organisational determinants, and health literacy outcomes. Socio-demographic variables analysed included sex, age, residence, educational attainment, marital status, occupation, disability status, and monthly household income. Results were presented using frequency distribution tables and summary statistics.

Health Literacy Measurement: Health literacy was measured using the Health Literacy Survey-European Union (HLS-EU) framework, which assesses respondents' ability to access, understand, appraise, and apply health information (Sørensen et al., 2013, 2021). Responses were aggregated to generate a composite Health Literacy Index (HLI) score ranging from 0 to 50, with higher scores indicating better health literacy. Consistent with established HLS-EU guidelines, respondents were categorised as having limited health literacy ($HLI < 33$) or adequate health literacy ($HLI \geq 33$). Descriptive analyses were conducted to determine mean HLI scores, standard deviations, and the distribution of health literacy levels across the study population and study districts.

Implementation Exposure Measurement: Implementation exposure was assessed using the Policy Reach Index (PRI), awareness of health literacy initiatives, and Community Health Worker (CHW) contact within the six months preceding the survey. The Policy Reach Index (PRI) was developed as a composite measure reflecting respondents' awareness of health literacy-related interventions, participation in health campaigns and community meetings, exposure to behaviour change communication activities, access to health information, and contact with Community Health Workers. Individual indicators were coded, aggregated, and standardised to generate a composite score ranging from 0 to 1, with higher values indicating greater implementation exposure and policy reach.

Organisational Capacity Measurement: Organisational Capacity (OC) was operationalised as a composite implementation construct reflecting institutional support for health literacy initiatives. The construct incorporated indicators related to leadership support, communication systems, supervision mechanisms, staffing adequacy, implementation climate, coordination structures, and operational readiness within district health systems. Higher scores indicated stronger organisational environments supporting implementation of health literacy initiatives.

Comparative Analysis: One-way Analysis of Variance (ANOVA) was conducted to compare mean Health Literacy Index scores across Dodoma City Council, Kongwa District, and Chamwino District. Where statistically significant differences were identified, findings were interpreted in relation to implementation exposure and contextual variations across districts.

Regression Analysis: Inferential statistical analyses were subsequently performed to examine factors associated with health literacy outcomes. Initially, bivariate analyses were conducted to assess associations between predictor variables and Health Literacy Index scores. Variables demonstrating theoretical relevance and statistical association were subsequently included in the multivariable regression model.

Multiple linear regression analysis was employed to examine the association between implementation exposure, organisational determinants, and health literacy outcomes while controlling for selected socio-demographic characteristics. The dependent variable was the continuous Health Literacy Index (HLI) score. Independent variables included the Policy Reach Index (PRI), Community Health Worker (CHW) contact, and Organisational Capacity (OC). Educational attainment and place of residence were included as moderating variables through interaction terms, while age and sex were included as control variables. The regression model was specified as follows:

$$HLI_i = \beta_0 + \beta_1 PRI_i + \beta_2 CHW_i + \beta_3 OC_i + \beta_4 Edu_i + \beta_5 Residence_i + \beta_6 (PRI \times Edu)_i + \beta_7 (CHW \times Residence)_i + \beta_8 Age_i + \beta_9 Sex_i + \epsilon_i$$

Where HLI_i represents the Health Literacy Index score for respondent i ; PRI_i represents the Policy Reach Index; CHW_i represents Community Health Worker contact; OC_i represents Organisational Capacity; Edu_i represents educational attainment; $Residence_i$ represents place of residence; Age_i and Sex_i represent respondent age and sex, respectively; and ϵ_i represents the error term. The interaction terms $(PRI \times Edu)_i$ and $(CHW \times Residence)_i$ were included to assess moderation effects. Standardised regression coefficients (β) were reported to facilitate comparison of the relative strength of associations across predictor variables.



Regression coefficients (β), standard errors (SE), 95% confidence intervals (CI), coefficients of determination (R^2), adjusted R^2 values, F-statistics, and p-values were reported. Statistical significance was determined at $p < 0.05$. Prior to model estimation, assumptions underlying multiple linear regression were assessed. Linearity was examined using scatterplots and partial regression plots; normality of residuals was evaluated through histogram inspection and normal probability plots; homoscedasticity was assessed using residual-versus-fitted value plots; and multicollinearity was examined using Variance Inflation Factor (VIF) statistics. Independence of residuals was assessed using the Durbin-Watson statistic. Diagnostic results indicated that the assumptions for multiple linear regression were adequately satisfied.

3.5.2 Qualitative Data Analysis

Qualitative data obtained from key informant interviews, focus group discussions, and document reviews were transcribed verbatim, translated into English where necessary, and analysed thematically using NVivo version 14. Analysis was guided by the Consolidated Framework for Implementation Research (CFIR), whereby deductive coding was used to identify predefined CFIR constructs and inductive coding was applied to capture emerging contextual themes relevant to the study setting.

Document review data were analysed using thematic content analysis to identify recurring themes related to conceptualisation of health literacy, implementation approaches, financing mechanisms, monitoring systems, institutional responsibilities, and operational structures for implementation of health literacy initiatives. Findings from qualitative analysis were triangulated with quantitative results to enhance validity, analytical consistency, and interpretation of study findings.

3.5.3 Data Integration

Integration of quantitative and qualitative findings occurred during the interpretation stage through triangulation, following the convergent parallel mixed-methods design. Quantitative findings on implementation exposure, health literacy levels, and associated factors were compared and contrasted with qualitative themes emerging from key informant interviews, focus group discussions, and document reviews. This integration enabled identification of convergence, divergence, and complementarity between quantitative and qualitative evidence, providing a more comprehensive understanding of implementation dynamics and health literacy outcomes within decentralised health systems.

3.6 Ethical Considerations

Ethical approval for the study was obtained from the Sokoine University of Agriculture (SUA), Tanzania, under reference number SUA/PPM/D/2022/0004/31. Additional permission to conduct the study was granted by the Dodoma Regional Administrative Secretary and the respective District Executive Directors within the selected study districts.

Written informed consent was obtained from all participants prior to data collection after providing information regarding the purpose of the study, study procedures, potential risks and benefits, and the voluntary nature of participation. Participants were informed of their right to decline participation or withdraw from the study at any stage without penalty. Confidentiality and anonymity were maintained throughout the study through the use of identification codes instead of personal names, while all research data were securely stored in password-protected electronic devices accessible only to the researcher.

4. Results and Discussion

4.1 Sociodemographic Characteristics of Respondents

A total of 385 respondents participated in the study, yielding a response rate of 97.2%. Female respondents constituted slightly more than half of the study population (54.3%, $n = 209$), while males accounted for 45.7% ($n = 176$). The distribution of respondents across study districts reflected the sampling distribution of the study population, with 45.1% ($n = 174$) drawn from Dodoma City Council, 28.7% ($n = 110$) from Chamwino District, and 26.2% ($n = 101$) from Kongwa District. Regarding age distribution, the largest proportion of respondents was aged between 30 and 39 years (31.4%, $n = 121$), followed by respondents aged 40–49 years (26.8%, $n = 103$), those aged 50 years and above (22.6%, $n = 87$), and respondents aged 18–29 years (19.2%, $n = 74$).

Most respondents resided in rural areas (61.8%, $n = 238$), whereas 38.2% ($n = 147$) resided in urban settings. In terms of educational attainment, more than half of respondents (57.1%, $n = 220$) had completed primary education, while 30.9% ($n = 119$) had attained secondary education or higher. Respondents without formal education accounted for 12.0% ($n = 46$) of the study population. The majority of respondents were married (86.0%, $n = 331$), whereas 6.5% ($n = 25$) were single and 7.5% ($n = 29$) were divorced, widowed, or separated. Nearly all respondents reported no disability (99.7%, $n = 384$).

Regarding occupation, farming constituted the predominant economic activity among respondents (41.0%, $n = 158$), followed closely by petty business activities (39.7%, $n = 153$). Wage employment accounted for 18.7% ($n = 72$) of respondents, while livestock keeping represented a relatively



small proportion of the study population (0.5%, $n = 2$). In relation to household income, more than half of respondents (55.6%, $n = 214$) reported monthly household incomes below TZS 1,000,000. Approximately one-third (30.6%, $n = 118$) reported monthly household incomes ranging between TZS 1,000,001 and 3,000,000, whereas 10.6% ($n = 41$) reported incomes between TZS 3,000,001 and 7,000,000. Only 3.1% ($n = 12$) of respondents reported monthly household incomes exceeding TZS 7,000,000. A summary of respondents' sociodemographic characteristics is presented in Table 3.

Table 3: Sociodemographic Characteristics of Respondents (N = 385)

Variable	Category	Frequency (n)	Percentage (%)
Sex	Male	176	45.7
	Female	209	54.3
	Subtotal	385	100.0
Age Group (Years)	18–29	74	19.2
	30–39	121	31.4
	40–49	103	26.8
	50 years and above	87	22.6
	Subtotal	385	100.0
Residence	Urban	147	38.2
	Rural	238	61.8
	Subtotal	385	100.0
Educational Attainment	No formal education	46	12.0
	Primary education	220	57.1
	Secondary education or higher	119	30.9
	Subtotal	385	100.0
Marital Status	Single	25	6.5
	Married	331	86.0
	Divorced/Widowed/Separated	29	7.5
	Subtotal	385	100.0
Disability Status	Yes	1	0.3
	No	384	99.7
	Subtotal	385	100.0
Occupation	Farming	158	41.0
	Petty business	153	39.7
	Wage employment	72	18.7
	Livestock keeping	2	0.5
	Subtotal	385	100.0
Monthly Household Income (TZS)	< 1,000,000	214	55.6
	1,000,001-3,000,000	118	30.6
	3,000,001-7,000,000	41	10.6
	> 7,000,000	12	3.1
	Subtotal	385	100.0

The sociodemographic profile of respondents reflects the broader population characteristics of Dodoma Region, where subsistence agriculture and petty trade dominate livelihood strategies and where educational attainment remains relatively low (Tanzania National Bureau of Statistics, 2022). The predominance of primary education as the highest level of attainment (57.1%) is consistent with national patterns in Tanzania, where primary education remains the most common level of formal schooling, particularly in rural areas (United Republic of Tanzania, 2020). The high proportion of rural residents (61.8%) aligns with Dodoma Region's predominantly rural character,

although increasing urbanization is evident in Dodoma City Council (National Bureau of Statistics, 2022). The overrepresentation of female respondents (54.3%) is consistent with other household surveys in Tanzania, where women are more likely to be available during household visits and serve as primary respondents for health-related research (Kagoma *et al.*, 2025).

4.2 Implementation Status of Health Literacy Initiatives Under the National Health Policy of 2017

Document review and key informant interviews revealed that health literacy-related interventions in Tanzania remained embedded within broader health promotion and community participation strategies under the National Health Policy of 2017 and subsequent health sector frameworks. As summarized in Table 4, review of the National Health Policy of 2017, HSSP V Mid-Term Review 2024, and the Tanzania Development Vision 2050 Health Chapter showed that health literacy was not explicitly operationalized as an independent policy component. No dedicated implementation framework, operational guidelines, monitoring indicators, or earmarked budget lines specifically for health literacy were identified within policy documents reviewed between 2017 and 2025.

Table 4: Documentary Evidence of Health Literacy Policy-Implementation Gap, 2024/2025

Finding	National Policy Evidence	District Budget Evidence	Monitoring System Evidence	Implementation Evidence
No health literacy definition	HSSP V Mid-Term Review 2024 contained no explicit definition of health literacy	Not specified in district CCHPs	No HL terminology in DHIS2	Health literacy treated as general health promotion
No dedicated health literacy budget line	MoH Budget Speech 2025/26 contained no HL allocation	All districts used Item 2213 "Community Sensitization"	No HL expenditure category	Dependence on donor-funded interventions
No health literacy indicators	HSSP V MTR 2024 had no HL indicators	No HL indicators in district plans	DHIS2 v2.40.4 had no HL indicator	Monitoring focused on supervision activities
Rural disparities in implementation	CHW Guidelines lacked rural HL support mechanisms	Lower per capita allocations in rural districts	No rural HL monitoring system	Limited outreach and infrastructure constraints
Donor dependence	TDV 2050 lacked HL financing priorities	Projects implemented outside district systems	Not integrated into routine systems	Heavy reliance on NGOs and development partners

Analysis of Comprehensive Council Health Plans (CCHPs) for Dodoma Municipal Council, Kongwa District Council, and Chamwino District Council further showed that health



literacy-related activities were implemented under “Community Sensitization and Health Education” through Sub-vote 2001, Item 2213. As presented in Table 5, budget allocations for these activities during the 2024/2025 financial year were TShs 58,900,000 for Dodoma Municipal Council, TShs 41,200,000 for Kongwa District Council, and TShs 45,600,000 for Chamwino District Council. None of the districts had a dedicated budget line specifically allocated for health literacy interventions.

Key informant interviews with Regional Health Management Team officials further indicated that implementation of health literacy-related activities was largely dependent on donor-funded programmes and short-term project-based interventions. Documentary review of the *UNFPA Chamwino Project Report (2024)* showed that approximately USD 2.3 million was allocated to sexual and reproductive health training for over 600 healthcare workers, although the intervention framework did not include a dedicated health

Table 5: Health Promotion Budget Allocation Across Dodoma Districts, 2024/2025

District	Total Health Budget (TShs)	Health Promotion Budget (TShs)	Percentage of Total Budget	Health Literacy Budget Line
Dodoma MC	4,210,500,000	58,900,000	1.4%	0
Kongwa DC	3,745,800,000	41,200,000	1.1%	0
Chamwino DC	3,800,000,000	45,600,000	1.2%	0
National Health Budget	1,620,000,000,000	Not disaggregated	N/A	0

Implemented initiatives identified across the reviewed districts included integration of health education messages into routine healthcare services, Community Health Worker (CHW)-based communication activities, distribution of Information, Education, and Communication (IEC) materials, and community sensitization campaigns conducted through health promotion programmes. Review of the Integrated and Coordinated Community Health Workers Program (iCCHE) 2024-2028 further indicated deployment of 137,294 CHWs nationally using digital tablets for community health activities. However, no dedicated health literacy assessment module or monitoring component was identified within programme implementation documents.

The review further showed that several planned initiatives were either minimally implemented or absent. These included establishment of district-level health literacy coordination structures, development of health literacy-specific monitoring indicators, and allocation of dedicated financial resources for health literacy programmes. Analysis of the Ministry of Health Budget Speech for 2025/2026 indicated that although the health sector received TShs 1.62 trillion, no direct allocation or specific reference to health literacy was identified within national budget priorities.

Key informant interviews conducted in April 2026 further indicated that health literacy activities were implemented indirectly through general health education programmes rather than through structured health literacy systems. One District Health Officer explained:

“We implement health education activities, but there is no separate plan, budget, or reporting system specifically for health literacy. It is assumed to be part of general health promotion.” (KII-DHO-03, May 2026)

literacy competency assessment component.

Several institutional and infrastructural barriers affecting implementation were identified. These included absence of operational guidelines, inadequate human resources, weak supervision systems, fragmented communication structures, limited inter-sectoral coordination, and insufficient digital infrastructure.

Qualitative findings further revealed urban–rural disparities in implementation coverage of health literacy-related interventions. Respondents from rural wards reported fewer community outreach activities, reduced functionality of Community Health Workers, and limited access to health communication platforms compared with urban settings. Documentary review of the Dodoma Regional Annual Implementation Report (2023/2024) further indicated that although supportive supervision coverage across the region reached 89%, per capita budget allocations for health promotion activities were comparatively lower in Kongwa District Council and Chamwino District Council than in Dodoma Municipal Council.

The findings on implementation status reveal a fundamental disconnect between policy recognition and operational institutionalisation of health literacy within Tanzania's decentralised health system. The absence of explicit health literacy definitions, dedicated budget lines, implementation guidelines, and monitoring indicators indicates that health literacy remains conceptually and operationally peripheral within the health policy framework (Luinga & Kessy, 2024). This finding is consistent with broader critiques of health policy implementation in sub-Saharan Africa, where policy recognition often fails to translate into institutionalised practice due to weak operational frameworks and inadequate resource allocation (Gilson *et al.*, 2018; Passi *et al.*, 2023).



The dependence on donor-funded programmes for health literacy-related activities identified in this study aligns with evidence from other LMIC settings, where health promotion interventions often rely on short-term project-based funding rather than sustainable domestic resource allocation (Ghosh *et al.*, 2021). This dependency creates vulnerability to funding fluctuations and programme discontinuity, undermining the sustainability of health literacy initiatives (Shahid *et al.*, 2022). The observation that health literacy activities are implemented under "Community Sensitization and Health Education" budget lines rather than dedicated health literacy allocations further suggests that health literacy is not prioritised as a distinct health system function, consistent with findings from other decentralised health systems in East Africa (Kagoma *et al.*, 2024).

The urban-rural disparities in implementation coverage identified through qualitative findings are consistent with documented patterns of health service inequality in Tanzania, where rural areas experience lower per capita health expenditures, reduced staffing levels, and limited access to health communication infrastructure (United Republic of Tanzania, 2020). The finding that supportive supervision coverage reached 89% regionally but per capita budget allocations varied substantially across districts highlights the limitations of focusing on process indicators without attention to resource distribution and implementation intensity (Spencer *et al.*, 2024).

From a theoretical perspective, these findings support the CFIR proposition that intervention characteristics, including the absence of clear policy specifications and operational guidelines, significantly influence implementation effectiveness (Damschroder *et al.*, 2009, 2022). The findings also reinforce the importance of the inner setting domain, as organisational capacity, resource availability, and implementation climate within district health systems emerge as critical determinants of whether policy commitments translate into operational activities (Damschroder *et al.*, 2022; Proctor *et al.*, 2011).

4.3 Health Literacy and Implementation Exposure Levels

The findings demonstrated generally low levels of health literacy and implementation exposure among respondents across the study districts. Health literacy was measured using the Health Literacy Survey-European Union (HLS-EU) composite scale assessing respondents' ability to access, understand, appraise, and apply health information, with scores ranging from 0 to 50 (Sørensen *et al.*, 2013, 2021). The mean Health Literacy Index (HLI) score was 21.4 (SD = 8.7), representing approximately 42.8% of the maximum attainable score. Overall, 73.8% of respondents demonstrated

limited health literacy (HLI < 33), while only 26.2% attained adequate health literacy levels (HLI ≥ 33).

Implementation exposure was assessed using the Policy Reach Index (PRI), a composite measure reflecting respondents' awareness of health literacy initiatives, exposure to Community Health Workers (CHWs), participation in health campaigns and community meetings, access to health information, exposure to health promotion activities, and behaviour change communication (BCC) interventions. The mean Policy Reach Index (PRI) score was 0.12 (SD = 0.09), indicating low implementation exposure within the study population. Most respondents (78.4%) reported no awareness of health literacy initiatives implemented within their communities, whereas only 21.6% reported some degree of awareness. Similarly, only 23.0% (n = 89) of respondents reported contact with a Community Health Worker (CHW) within the six months preceding the survey, while 77.0% (n = 296) reported no recent CHW contact.

Health literacy levels varied significantly across the three study districts. Respondents from Dodoma City Council reported the highest mean HLI score (23.1 ± 9.2), followed by Kongwa District (20.8 ± 8.1) and Chamwino District (20.3 ± 8.5). One-way analysis of variance demonstrated statistically significant differences in HLI scores across districts ($F = 3.42$, $p = 0.034$). Respondents from Dodoma City Council reported the highest mean HLI score, followed by Kongwa District and Chamwino District (Table 6).

The low mean HLI score of 21.4 observed in this study is considerably lower than levels reported in high-income settings, where mean health literacy scores typically range from 30 to 35 on comparable scales (Sørensen *et al.*, 2015). However, the findings are consistent with evidence from other LMIC settings, where health literacy levels are frequently constrained by limited access to health information, weak health promotion systems, educational inequalities, and broader socioeconomic barriers (Passi *et al.*, 2023; Shahid *et al.*, 2022). The proportion of respondents with limited health literacy (73.8%) is comparable to findings from other sub-Saharan African studies, which have reported limited health literacy prevalence ranging from 60% to 80% in resource-constrained settings (Murugesu *et al.*, 2022; Niltakan, 2024).

The low Policy Reach Index (PRI) score of 0.12 indicates that health literacy initiatives are reaching only a small fraction of the population, consistent with evidence from other decentralised health systems where implementation challenges constrain the translation of policy commitments into effective community-level interventions (Gilson *et al.*, 2018; Ghosh *et al.*, 2021). The finding that 78.4% of



respondents reported no awareness of health literacy initiatives suggests that communication and outreach systems are not effectively disseminating health information to communities, reinforcing concerns about the reach of health promotion activities in resource-constrained settings (Luvunga & Kessy, 2024).

proposition that implementation exposure is a critical intermediate outcome linking policy implementation to population-level health outcomes (Damschroder *et al.*, 2022; Proctor *et al.*, 2011).

Table 6: Descriptive Statistics for Health Literacy and Implementation Exposure Variables (n = 385)

Variable	Category/Measure	Frequency (n)	Percentage (%)	Mean ± SD
Health Literacy Index (HLI)	Overall score			21.4 ± 8.7
	Limited health literacy (HLI < 33)		73.8	
	Adequate health literacy (HLI ≥ 33)		26.2	
Policy Reach Index (PRI)	Overall score			0.12 ± 0.09
Awareness of Health Literacy Initiatives	Aware		21.6	
	Not aware		78.4	
Community Health Worker (CHW) Contact (Last 6 Months)	Yes	89	23.0	
	No	296	77.0	
Mean HLI by District	Dodoma City Council			23.1 ± 9.2
	Kongwa District			20.8 ± 8.1
	Chamwino District			20.3 ± 8.5
ANOVA Results	HLI across districts			F = 3.42, p = 0.034

The low proportion of respondents reporting recent CHW contact (23.0%) is concerning given the recognised importance of community health workers in bridging health system-community gaps and promoting health literacy in underserved populations (Leban *et al.*, 2021). This finding suggests that CHW programmes may be underutilised or insufficiently supported as platforms for health literacy promotion, consistent with evidence from other Tanzanian settings where CHW activities are constrained by inadequate supervision, transport challenges, and competing priorities (Mshingo & Muhanga, 2021).

The significant variation in HLI scores across districts (F = 3.42, p = 0.034), with Dodoma City Council showing the highest scores, reflects urban–rural disparities in access to health information and services documented in previous studies (Kagoma *et al.*, 2025; Spencer *et al.*, 2024). Urban residents typically have greater access to mass media, health facilities, and information sources, contributing to higher health literacy levels (Murugesu *et al.*, 2022). The finding that Chamwino District, the most rural setting, had the lowest HLI scores highlights the need for targeted interventions to address rural health literacy gaps.

From a theoretical perspective, these findings provide empirical support for the SEM framework by demonstrating that health literacy outcomes are shaped by factors operating at multiple ecological levels. The significant district-level variation in health literacy suggests that community and organisational-level factors, including health infrastructure, communication systems, and implementation capacity, influence individual health literacy outcomes beyond individual-level characteristics (McLeroy *et al.*, 1988; Osborne *et al.*, 2022). The findings also support the CFIR

4.4 Association Between Implementation Exposure and Health Literacy Outcomes

Multiple linear regression analysis was conducted to examine the association between implementation exposure and health literacy outcomes among respondents in Dodoma Region. Standardised regression coefficients (β) are reported to facilitate comparison of the relative strength of associations across predictor variables. After adjusting for age, sex, educational attainment, and place of residence, the overall regression model was statistically significant and explained 42.3% of the variance in Health Literacy Index (HLI) scores ($R^2 = 0.423$; Adjusted $R^2 = 0.409$; $F(9,375) = 30.52$, $p < 0.001$), indicating substantial explanatory power.

Implementation exposure variables demonstrated statistically significant positive associations with health literacy outcomes. The Policy Reach Index (PRI) exhibited the strongest association with health literacy ($\beta = 0.38$, $SE = 0.05$, 95% CI [0.29, 0.47], $p < .001$), suggesting that respondents with greater exposure to health literacy-related interventions reported substantially higher health literacy levels. Similarly, respondents who reported contact with Community Health Workers (CHWs) had significantly higher HLI scores than those without recent CHW contact ($\beta = 0.21$, $SE = 0.05$, 95% CI [0.12, 0.30], $p < .001$).

Organisational capacity was also positively associated with health literacy outcomes ($\beta = 0.29$, $SE = 0.04$, 95% CI [0.21, 0.37], $p < .001$), indicating that stronger implementation environments contributed to improved health literacy. Moderation analysis further revealed that educational attainment significantly strengthened the relationship between policy reach and health literacy outcomes ($\beta = 0.19$, $SE = 0.06$, 95% CI [0.07, 0.31], $p = .003$). Respondents with



secondary education or higher benefited more from implementation exposure than those with lower educational attainment. Rural residence also significantly moderated the association between CHW contact and health literacy outcomes ($\beta = 0.14$, $SE = 0.06$, 95% CI [0.02, 0.26], $p = .021$), suggesting stronger effects of CHW engagement in rural settings.

Among the control variables, educational attainment remained independently associated with health literacy outcomes ($\beta = 0.33$, $SE = 0.05$, 95% CI [0.23, 0.43], $p < .001$). Age demonstrated a marginal negative association with HLI scores ($\beta = -0.08$, $SE = 0.04$, 95% CI [-0.16, 0.00], $p = .052$), while sex was not significantly associated with health literacy outcomes ($\beta = 0.05$, $SE = 0.04$, 95% CI [-0.03, 0.13], $p = .241$). Place of residence was retained in the model because of its theoretical relevance to implementation exposure and access to health information; however, its independent effect was not statistically significant after adjustment for other variables. Detailed regression results are presented in Table 7.

Table 7: Multiple Linear Regression Analysis of Factors Associated with Health Literacy Outcomes Among Respondents in Dodoma Region (n = 385)

Predictor Variable	β	SE	95% CI	p-value
Implementation Exposure Variables				
Policy Reach Index (PRI)	0.38	0.05	[0.29, 0.47]	< .001
CHW Contact (Yes = 1)	0.21	0.05	[0.12, 0.30]	< .001
Organisational Determinants				
Organisational Capacity	0.29	0.04	[0.21, 0.37]	< .001
Moderation Effects				
PRI $\times$ Education (Secondary+)	0.19	0.06	[0.07, 0.31]	.003
CHW $\times$ Rural Residence	0.14	0.06	[0.02, 0.26]	.021
Control Variables				
Age	-0.08	0.04	[-0.16, 0.00]	.052
Sex (Female = 1)	0.05	0.04	[-0.03, 0.13]	.241
Education (Secondary+)	0.33	0.05	[0.23, 0.43]	< .001

Model Summary: $R^2 = 0.423$; Adjusted $R^2 = 0.409$; $F(9,375) = 30.52$; $p < 0.001$. Note: β = standardized regression coefficient; SE = standard error; CI = confidence interval; CHW = Community Health Worker; PRI = Policy Reach Index.

Qualitative findings provided additional contextual explanation for the observed quantitative relationships. While implementation exposure, Community Health Worker engagement, and organisational capacity were positively associated with health literacy outcomes, key informants highlighted several institutional constraints that limited the effectiveness and sustainability of health literacy interventions. These included inadequate operational guidelines, insufficient budget allocation, weak supervision systems, and limited inter-sectoral coordination. One Regional Health Management Team member stated:

“Although health literacy is acknowledged in policy documents, the absence of dedicated funding and measurable indicators limits implementation at district and community levels.” (KII-RHMT-02, April 2026)

This finding suggests that despite the inclusion of health literacy within policy frameworks, inadequate financial support and lack of measurable implementation indicators constrained effective translation of policy intentions into operational activities at district and community levels.

Similarly, another respondent noted:

“Implementation becomes difficult because health promotion activities compete with curative services for limited financial and human resources.” (KII-CHMT-04, April 2026)

This finding indicates that limited institutional resources and prioritisation of curative services reduced the capacity of health systems to effectively implement health promotion and health literacy interventions within communities.

The strong positive association between the Policy Reach Index and health literacy outcomes ($\beta = 0.38$, $p < .001$) provides compelling evidence that population exposure to health literacy initiatives significantly influences individual health literacy competencies (Sørensen et al., 2021). This finding supports the growing recognition that health literacy is not solely an individual attribute but is shaped by systemic factors including the reach and effectiveness of health communication systems (Nutbeam & Lloyd, 2020; Osborne et al., 2022). The magnitude of this association, with PRI being the strongest predictor in the model, underscores the critical importance of ensuring that health literacy interventions achieve adequate population coverage and intensity.

The significant positive association between CHW contact and health literacy outcomes ($\beta = 0.21$, $p < .001$) reinforces the importance of community-based health workers as intermediaries between health systems and communities (Leban et al., 2021). Community Health Workers serve as trusted sources of health information, particularly in settings where formal health services are distant or inaccessible (Mshingo & Muhanga, 2021). The finding that rural residents derived greater benefit from CHW contact ($\beta = 0.14$, $p = .021$) suggests that community health workers are particularly effective in underserved areas where alternative information sources are limited, consistent with evidence from other LMIC settings (Murugesu et al., 2022; Passi et al., 2023).



The strong positive association between organisational capacity and health literacy outcomes ($\beta = 0.29$, $p < .001$) highlights the importance of supportive implementation environments for translating policy intentions into population-level outcomes (Damschroder *et al.*, 2022; Proctor *et al.*, 2011). Organisational capacity encompasses leadership support, communication systems, supervision mechanisms, and resource availability within district health systems, all of which are critical for effective implementation of complex interventions (Damschroder *et al.*, 2009; Ghosh *et al.*, 2021). The finding that respondents in districts with stronger organisational capacity reported higher health literacy underscores the need to strengthen institutional systems as a foundation for health literacy promotion.

The moderating effect of educational attainment ($\beta = 0.19$, $p = .003$) reveals important equity implications. Respondents with higher educational attainment derived greater benefit from implementation exposure, suggesting that current health literacy interventions may inadvertently widen health literacy inequalities (Nutbeam & Lloyd, 2020; Spencer *et al.*, 2024). This finding supports calls for equity-sensitive health communication strategies that are accessible to populations with varying literacy levels (Shahid *et al.*, 2022; WHO, 2022). The marginal negative association between age and health literacy ($\beta = -0.08$, $p = .052$) is consistent with evidence that health literacy tends to decline with age, potentially due to cognitive changes and reduced engagement with health information systems (Sørensen *et al.*, 2015).

The qualitative findings revealing institutional constraints including inadequate funding, weak supervision, and limited coordination triangulate and enrich the quantitative results. These findings align with CFIR propositions that inner setting factors including implementation climate, leadership engagement, and resource availability significantly influence implementation effectiveness (Damschroder *et al.*, 2022). The observation that health promotion activities compete with curative services for limited resources reflects broader health system challenges in resource-constrained settings, where preventive and promotive services often receive lower priority (Gilson *et al.*, 2018; Kagoma *et al.*, 2024).

4.5 Institutional and Contextual Factors Influencing Implementation

Qualitative thematic analysis guided by the Consolidated Framework for Implementation Research (CFIR) identified several institutional and contextual factors influencing implementation of health literacy initiatives within Dodoma Region. Findings from key informant interviews indicated that implementation effectiveness was constrained by organisational and system-level challenges affecting

coordination, financing, supervision, monitoring systems, and community outreach activities. The major barriers identified included absence of dedicated health literacy policy guidelines, inadequate budget allocation for health literacy activities, limited training and supervision of Community Health Workers (CHWs), weak monitoring and evaluation systems, fragmented inter-departmental coordination, dependence on donor-funded programmes, and inadequate communication infrastructure within rural districts. Respondents reported that health literacy activities were commonly implemented under broader health promotion programmes without clear operational structures or implementation frameworks.

One Regional Health Management Team member explained:

“Although health literacy is acknowledged in policy documents, the absence of dedicated funding and measurable indicators limits implementation at district and community levels.” (KII-RHMT-02, April 2026)

The statement indicated that health literacy implementation remained weakly institutionalised within district health systems despite inclusion within broader policy and health promotion frameworks. Similarly, a Council Health Management Team official reported:

“Implementation becomes difficult because health promotion activities compete with curative services for limited financial and human resources.” (KII-CHMT-04, April 2026)

This finding reflected existing resource constraints within district health systems, where curative services were prioritised over preventive and promotive health activities, including health literacy interventions.

Key informants further reported that implementation indicators for health literacy activities were not formally integrated into district performance monitoring systems, thereby limiting routine monitoring and reporting. Several respondents also indicated that implementation of health literacy interventions largely depended on short-term donor-supported programmes rather than sustainable institutional systems. One District Health Officer stated:

“Most health literacy activities depend on partner-supported campaigns. When projects end, many community outreach activities also stop.” (KII-DHO-05, April 2026)

The finding suggested that continuity of health literacy activities remained vulnerable to fluctuations in external donor support and project-based financing mechanisms.



Participants additionally identified infrastructural limitations affecting implementation within rural districts, including poor transport systems, inadequate digital infrastructure, and limited communication equipment for CHWs and primary healthcare facilities. A Community Health Worker from Chamwino District reported:

“Some villages are very difficult to reach, especially during the rainy season. Without transport and communication support, regular household visits become difficult.” (KII-CHW-08, April 2026)

The statement demonstrated that geographical and infrastructural barriers limited continuity and coverage of community outreach activities within remote rural communities.

Despite these barriers, several facilitating factors supporting implementation were identified. Respondents highlighted the presence of existing Community Health Worker structures, integration of health education into routine clinical services, support from development partners, radio-based health communication campaigns, and strong community demand for health information as important facilitators of implementation. Participants from Kongwa District further reported that the district-owned community radio station supported dissemination of health information and community sensitisation activities across rural communities. One Ward Health Officer explained:

“Radio programmes and community meetings have helped many people receive health information, especially in areas where access to health facilities is limited.” (KII-WHO-06, April 2026)

The statement illustrated the contribution of community-based communication platforms in improving dissemination of health information within underserved communities. Similarly, a participant from Kongwa District reported:

“Communities are willing to participate and ask questions when health education sessions are conducted regularly.” (FGD Participant, Kongwa District, April 2026)

This finding suggested that regular community engagement and health education sessions facilitated community participation and responsiveness to health literacy interventions at local level.

The institutional and contextual factors identified in this study align closely with CFIR domains and provide empirical support for the framework’s utility in explaining implementation effectiveness in decentralised health systems (Damschroder *et al.*, 2009, 2022). The absence of dedicated health literacy policy guidelines, operational frameworks, and monitoring indicators corresponds to the CFIR domain

of intervention characteristics, specifically the constructs of complexity and design quality (Damschroder *et al.*, 2009). The lack of clear operational guidance creates ambiguity for implementers, reducing the likelihood that health literacy activities are systematically planned and executed (Proctor *et al.*, 2011).

The inadequate budget allocation for health literacy activities and dependence on donor funding reflect constraints within the CFIR inner and outer setting domains (Damschroder *et al.*, 2022; Ghosh *et al.*, 2021). The reliance on short-term project-based funding rather than sustainable domestic resource allocation undermines implementation continuity and institutionalisation, consistent with evidence from other LMIC settings where health promotion programmes often fail to achieve sustainability (Gilson *et al.*, 2018; Shahid *et al.*, 2022). The prioritisation of curative services over health promotion observed in this study reflects broader health system orientation issues, where resources are disproportionately allocated to treatment rather than prevention (Kagoma *et al.*, 2024; WHO, 2022).

The limited training and supervision of CHWs, weak monitoring systems, and fragmented inter-departmental coordination correspond to CFIR domains of inner setting (organisational capacity, implementation climate) and implementation process (monitoring, evaluation, and feedback) (Damschroder *et al.*, 2009, 2022). These implementation challenges are well documented in Tanzanian health systems research, which has consistently identified weak supervision, inadequate monitoring, and poor coordination as constraints to effective health programme implementation (Kagoma *et al.*, 2025; Luvinga & Kessy, 2024). The infrastructural limitations identified in rural districts, including poor transport and limited communication equipment, reflect broader health system weaknesses that disproportionately affect underserved populations (Murugesu *et al.*, 2022; Spencer *et al.*, 2024).

The facilitating factors identified, including existing CHW structures, integration of health education into routine services, radio-based communication, and community demand for health information, provide important opportunities for strengthening health literacy implementation (Leban *et al.*, 2021; Mshingo & Muhanga, 2021). Radio-based health communication is particularly promising given the high radio penetration in rural Tanzania, where radio remains the most accessible mass media platform (Luvinga & Kessy, 2024). The strong community demand for health information reported by participants suggests readiness and receptivity that could be leveraged to strengthen health literacy interventions if implementation barriers are addressed.



5.0 Conclusions and Recommendations

This study examined health literacy implementation under Tanzania's National Health Policy of 2017 in Dodoma Region, revealing a profound implementation gap wherein health literacy remains weakly institutionalised within district health systems despite policy recognition. The findings demonstrated alarmingly low health literacy levels and implementation exposure among the study population, with only one in five respondents reporting awareness of health literacy initiatives. Regression analysis confirmed that implementation exposure, organisational capacity, and Community Health Worker contact were significantly associated with health literacy outcomes, while the moderating effect of educational attainment revealed that current interventions may inadvertently widen inequalities, and rural residents derived greater benefit from Community Health Worker engagement. Theoretically, the study validates the integrated SEM-CFIR framework, demonstrating that policy recognition alone is insufficient without enabling institutional structures, implementation capacity, and sustained resource allocation across all ecological levels.

Policy implications demand urgent action: explicit institutionalisation of health literacy through operational definitions, guidelines, measurable indicators, and dedicated financing; strengthening organisational capacity within health management teams through leadership, supervision, and routine monitoring; expanding Community Health Worker programmes with supportive supervision and competency development; adopting equity-sensitive communication strategies for populations with lower educational attainment; and integrating health literacy within broader health system strengthening initiatives.

Without deliberate investments in institutional capacity, implementation systems, and community-based communication platforms, health literacy initiatives will perpetuate health inequalities and undermine health system resilience. Future research should prioritise implementation-focused and longitudinal studies to assess long-term outcomes, evaluate implementation strategies, and examine sustainability across diverse sub-Saharan African contexts to generate evidence for refining policies and strengthening systems where health literacy remains a critical under-addressed determinant of population health.

Declaration of Conflict of Interest

We hereby declare that there are no known competing financial interests or personal relationships that could have influenced the research and findings presented in this paper.

References

- Bindhu, S., Nattam, A., Xu, C., Vithala, T., Grant, T., & Jacinda, K. (2024). Roles of health literacy in relation to social determinants of health and recommendations for informatics-based interventions: Systematic review. *Online Journal of Public Health Informatics*, 16, 1–14. <https://doi.org/10.2196/50898>
- Buse, K., Mays, N., Colombini, M., Fraser, A., Khan, M., & Walls, H. (2023). *Making health policy* (3rd ed.). McGraw Hill.
- Coughlin, S. S., Vernon, M., Hatzigeorgiou, C., & George, V. (2021). Health literacy, social determinants of health, and disease prevention and control. *Journal of Environmental Health Science*, 6(1), 2019–2022.
- Creswell, J. W., & Plano Clark, V. L. (2017). *Designing and conducting mixed methods research* (3rd ed.). Sage Publications.
- Damschroder, L. J., Aron, D. C., Keith, R. E., Kirsh, S. R., Alexander, J. A., & Lowery, J. C. (2009). Fostering implementation of health services research findings into practice: A consolidated framework for advancing implementation science. *Implementation Science*, 4(1), 1–15. <https://doi.org/10.1186/1748-5908-4-50>
- Damschroder, L. J., Reardon, C. M., Widerquist, M. A. O., & Lowery, J. (2022). Conceptualizing outcomes for use with the Consolidated Framework for Implementation Research (CFIR): The CFIR Outcomes Addendum. *Implementation Science*, 17(1), 1–10. <https://doi.org/10.1186/s13012-021-01181-5>
- Fitzpatrick, P. J. (2023). Improving health literacy using the power of digital communications to achieve better health outcomes for patients and practitioners. *Frontiers in Digital Health*, 5, 1–13. <https://doi.org/10.3389/fdgh.2023.1264780>
- Gilson, L., Orgill, M., & Shroff, Z. C. (2018). *A health policy analysis reader: The politics of policy change in low- and middle-income countries*. World Health Organization.
- Hennink, M., & Kaiser, B. N. (2022). Sample sizes for saturation in qualitative research: A systematic review of empirical tests. *Social Science & Medicine*, 292, 114523. <https://doi.org/10.1016/j.socscimed.2021.114523>
- Kagoma, P., Mongi, R., & Kalolo, A. (2025). Exploratory mixed-methods analysis of the determinants of use of health research evidence among planning teams in Tanzania. *BMJ Open*, 15(10), e099692. <https://doi.org/10.1136/bmjopen-2025-099692>
- Kagoma, P., Mongi, R., Kapologwe, N. A., Kengia, J., & Kalolo, A. (2024). Health research evidence: Its



- current usage in health planning, determinants and readiness to use knowledge translation tools among health planning teams in Tanzania—An exploratory mixed-methods study protocol. *BMJ Open*, 14(6), e081517.
<https://doi.org/10.1136/bmjopen-2023-081517>
- Leban, K., Kok, M., & Perry, H. B. (2021). Community health workers at the dawn of a new era: 9. CHWs' relationships with the health system and communities. *Health Research Policy and Systems*, 19(3), 1–20.
<https://doi.org/10.1186/s12961-021-00756-4>
- Luvunga, M. E., & Kessy, A. T. (2024). Communication channels, community engagement and access to healthcare services in Tanzania. *The African Review*, 1(aop), 1–25.
- McLeroy, K. R., Bibeau, D., Steckler, A., & Glanz, K. (1988). Ecological perspective on health promotion programs. *Health Education Quarterly*, 15(4), 351–377.
<https://doi.org/10.1177/109019818801500401>
- Mshingo, D., & Muhanga, M. (2021). School-based efforts (SBEs) towards promotion of health literacy (HL) and health-related knowledge (HRK) in selected primary schools in Morogoro, Tanzania. *The Sub-Saharan Journal of Social Sciences and Humanities*.
- Murugesu, L., Heijmans, M., Rademakers, J., & Fransen, M. P. (2022). Challenges and solutions in communication with patients with low health literacy: Perspectives of healthcare providers. *PLoS ONE*, 17(5), 1–16.
<https://doi.org/10.1371/journal.pone.0267782>
- National Bureau of Statistics. (2022). *Tanzania demographic and health survey 2022*. Ministry of Health, Community Development, Gender, Elderly and Children.
- Niltakan, K. (2024). Health literacy in the digital age: Challenges and opportunities. *Journal of Buddhist Education and Research*, 10(3), 2586–9434.
- Niltakan, K. (2024). Health literacy in the digital age: Challenges and opportunities. *Journal of Buddhist Education and Research*, 10(3).
- Nutbeam, D. (2017). *Promoting, measuring and implementing health literacy: Implications for policy and practice in non-communicable disease prevention and control*. World Health Organization.
- Nutbeam, D., & Lloyd, J. E. (2020). Understanding and responding to health literacy as a social determinant of health. *Annual Review of Public Health*, 42, 159–173.
<https://doi.org/10.1146/annurev-publhealth-090419-102529>
- Orcid, R. M., & Hussein, L. (2022). Policy-making in Tanzania: A critical analysis of emerging trends and challenges in the context of health policy. *The African Review*, 1–20.
<https://doi.org/10.1163/1821889X-12340068>
- Osborne, R. H., Elmer, S., Hawkins, M., Cheng, C. C., Batterham, R. W., Dias, S., Good, S., Monteiro, M. G., Mikkelsen, B., Nadarajah, R. G., & Fones, G. (2022). Health literacy development is central to the prevention and control of non-communicable diseases. *BMJ Global Health*, 7(12), e010362. <https://doi.org/10.1136/bmjgh-2022-010362>
- Paakkari, L., & Okan, O. (2020). COVID-19: Health literacy is an underestimated problem. *The Lancet Public Health*, 5(5), e249–e250.
[https://doi.org/10.1016/S2468-2667\(20\)30086-4](https://doi.org/10.1016/S2468-2667(20)30086-4)
- Palu, U. M. (2022). The role of health literacy in improving health outcomes: Challenges, interventions, and policies. *Journal of Health Literacy and Qualitative Research*, 1(1), 15–30.
- Passi, R., Kaur, M., Lakshmi, P. V. M., Cheng, C., Hawkins, M., & Osborne, R. H. (2023). Health literacy strengths and challenges among residents of a resource-poor village in rural India: Epidemiological and cluster analyses. *PLOS Global Public Health*, 3(2), e0001595.
<https://doi.org/10.1371/journal.pgph.0001595>
- Proctor, E., Silmere, H., Raghavan, R., Hovmand, P., Aarons, G., Bunger, A., Griffey, R., & Hensley, M. (2011). Outcomes for implementation research: Conceptual distinctions, measurement challenges, and research agenda. *Administration and Policy in Mental Health and Mental Health Services Research*, 38(2), 65–76.
<https://doi.org/10.1007/s10488-010-0319-7>
- Saimon, M. (2023). Reflecting on communication practices for health literacy among people with hearing impairment in Tanzania amid COVID-19 pandemic. *Jurnal Promosi Kesehatan*, 11(1), 82–86. <https://doi.org/10.20473/jpk.V11.I1.2023.82-86>
- Shahid, R., Shoker, M., Chu, L. M., Frehlick, R., Ward, H., & Pahwa, P. (2022). Impact of low health literacy on patients' health outcomes: A multicenter cohort study. *BMC Health Services Research*, 22(1), 1–9.
<https://doi.org/10.1186/s12913-022-08527-9>
- Sørensen, K., Broucke, S. van den, Pelikan, J. M., Fullam, J., Doyle, G., Slonska, Z., Kondilis, B., Stoffels, V., Osborne, R. H., & Brand, H. (2013). Measuring health literacy in populations: Illuminating the design and development process of the European Health Literacy Survey Questionnaire (HLS-EU-Q). *BMC Public Health*, 13(1), 948.
<https://doi.org/10.1186/1471-2458-13-948>
- Sørensen, K., Levin-Zamir, D., Duong, T. V., Okan, O., Brasil, V. V., & Nutbeam, D. (2021). Building health literacy system capacity: A framework for



health literate systems. *Health Promotion*

International, 36(Suppl. 1), I13–I23.

<https://doi.org/10.1093/heapro/daab153>

Sørensen, K., Pelikan, J. M., Röthlin, F., Ganahl, K., Slonska, Z., Doyle, G., Fullam, J., Kondilis, B., Agraftiotis, D., Ueters, E., Falcon, M., Mensing, M., Tchamov, K., Van den Broucke, S., & Brand, H. (2015). Health literacy in Europe: Comparative results of the European Health Literacy Survey (HLS-EU). *European Journal of Public Health*, 25(6), 1053–1058.

<https://doi.org/10.1093/eurpub/ckv043>

Sørensen, K., Van den Broucke, S., Pelikan, J. M., Fullam, J., Doyle, G., Slonska, Z., Kondilis, B., Stoffels, V., Osborne, R. H., & Brand, H. (2013). Measuring health literacy in populations: Illuminating the design and development process of the European Health Literacy Survey Questionnaire (HLS-EU-Q). *BMC Public Health*, 13(1), 948. <https://doi.org/10.1186/1471-2458-13-948>

Spencer, M., Cruickshank, V., Kemp, N., Melwani, S., & Nash, R. (2024). Health literacy profiling: A snapshot of Tasmania's challenges and strengths using five domains of the health literacy questionnaire (HLQ). *Health Literacy and Communication Open*, 2(1).

<https://doi.org/10.1080/28355245.2024.2410201>

United Republic of Tanzania. (2020). *National community health strategy 2020–2025*. Ministry of Health, Community Development, Gender, Elderly and Children.

World Health Organization. (2022). *Health literacy development for the prevention and control of noncommunicable diseases* (Vol. 1). World Health Organization.