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Joonas Korhonen

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## University of Turku

Faculty of Medicine
Department of Nursing Science
Nursing science
Doctoral Programme in Nursing Science (DPNurs)

## Supervised by

Professor Anna Axelin
Department of Nursing Science
University of Turku
Turku, Finland

Mari Lahti, PhD
Faculty of Health and Well-being
Turku University of Applied Sciences
Department of Nursing Science
University of Turku
Turku, Finland

## Reviewed by

Docent Krista Jokiniemi
Department of Nursing Sciences
University of Eastern Finland
Kuopio, Finland

Professor Anna Keski-Rahkonen
Department of Public Health
University of Helsinki
Helsinki, Finland.

## Opponent

Peter J.J. Goossens, PhD
Independent researcher
The Netherlands

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*This work is dedicated to the primary healthcare workers in Sub-Saharan Africa, for supporting mental health under demanding conditions.*

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## ABSTRACT

Mental health disorders pose a global threat to public health and represent one of the most significant risks to overall wellbeing. The situation is particularly critical in low-income countries, such as those in Sub-Saharan Africa, where most of those in need of mental health care live. Primary healthcare plays a pivotal role in the treatment of mental health disorders, often serving as the first point of contact within the healthcare system. However, limited professional support and low mental health–related understanding among healthcare workers in these settings can make it difficult to provide adequate care for the population.

This study aimed to assess the psychometric properties of a mental health literacy instrument and to examine mental health literacy and its determinants among primary healthcare workers in Sub-Saharan Africa. The study formed part of a larger international development project that involved the design and implementation of a screening tool and supplementary training programme to enhance the recognition of mental health problems in children and adolescents. Within the framework of this doctoral research employing a mixed-methods approach, three sub-studies were conducted: a content validation study of the Mental Health Literacy Scale instrument, and two cross-sectional, survey-based studies across five administrative regions within primary healthcare settings in South Africa and Zambia.

The results of the study demonstrated that the revised instrument is both content-wise and structurally appropriate for measuring nurses' perspectives on mental health problems as a comprehensive concept, for the first time in low-resource settings. The mental health literacy of primary healthcare workers was found to be moderate compared with previous research findings. The results revealed individual differences, particularly in attitudes towards mental health. Professionals with higher levels of education performed better than those with lower educational backgrounds. Prior exposure to routine practices involving mental health–related screening tools and assessment instruments appeared to influence the overall outcome and healthcare workers' attitudes towards mental health issues. Moving forward, it is essential to strengthen impact research, research infrastructure, and higher education related to mental health within the region.

KEYWORDS: Mental health, health literacy, mental health literacy, health promotion, nursing, low- and middle-income countries

TURUN YLIOPISTO
Lääketieteellinen tiedekunta
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Hoitotiede
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## TIIVISTELMÄ

Mielenterveyden häiriöt uhkaavat väestön terveyttä globaalisti ja ovat yksi keskeisimmistä riskeistä kestävän kehityksen tavoitteiden toteutumiselle. Tilanne on erityisen heikko alemman tulotason maissa, kuten Saharan eteläpuolisessa Afrikassa, sillä suurin osa mielenterveyden hoitoa tarvitsevista asuu näillä alueilla. Perusterveydenhuolto on keskeisessä roolissa mielenterveyden häiriöiden hoidossa, sillä se toimii usein ensimmäisenä hoitokontaktina. Näissä konteksteissa hoitajien ammatillisen tuen ja mielenterveyden lukutaidon puute voivat kuitenkin estää hyvän hoidon toteutumista.

Tämän tutkimuksen yleisenä tavoitteena oli arvioida mielenterveyden lukutaidon mittarin psykometrisia ominaisuuksia sekä tarkastella mielenterveyden lukutaitoa ja siihen vaikuttavia tekijöitä perusterveydenhuollossa Saharan eteläpuolisessa Afrikassa. Tutkimuksessa käytettiin monimenetelmällistä tutkimusotetta, joka koostui kolmesta osatutkimuksesta: 1) mielenterveyslukutaitoa mittaavan mittarin sisältövaliditeetin arviointi, 2) mittarin rakenteen ja sisäisen konsistenssin tarkastelu sekä 3) mielenterveyslukutaitoa kartoittavat poikittaistutkimus, jotka toteutettiin perusterveydenhuollossa viidellä hallinnollisella alueella Etelä-Afrikassa ja Sambiassa.

Tutkimuksen tulokset osoittivat, että Mental Health Literacy Scale -instrumentti on sisällöllisesti ja rakenteellisesti soveltuva mittaamaan alemman ja keskituloluokan maiden perusterveydenhuollon ammattilaisten tietämystä, tunnistamista ja asenteita mielenterveyden ongelmia kohtaan. Perusterveydenhuollon ammattilaisten mielenterveyden lukutaito osoittautui kohtalaiseksi verrattuna aiempiin tutkimustuloksiin. Tuloksissa havaittiin yksilöllisiä eroja, erityisesti asenteisiin liittyvää vaihtelua. Korkeammin koulutetut menestyivät paremmin kuin matalamman koulutustaustan omaavat. Lisäksi aiemmat rutiinit, mielenterveyden seulontatyökalujen ja mittareiden käyttö, olivat yhteydessä hoitajien asenteisiin, jotka tukevat mielenterveyteen liittyviä tekijöitä. Jatkossa alueella tulisi vahvistaa mielenterveyden hoitoon liittyvää korkeakoulutusta, vaikuttavuustutkimusta sekä tutkimusinfrastruktuuria.

AVAINSANAT: mielenterveys, terveyden lukutaito, mielenterveyden lukutaito, terveyden edistäminen, hoitotyö, alhaisen ja keskitulotason maat

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# Abbreviations

| | |
|---|---|
| MHL | Mental health literacy |
| SSA | Sub-Saharan Africa |
| PHC | Primary healthcare |
| EU | European Union |
| PRISMA | Preferred Reporting Items for Systematic reviews and Meta-Analyses |
| CASP | Critical Appraisal Skills Programme |
| MHLS | Mental Health Literacy Scale (O'Connor & Casey, 2015) |
| RCT | Randomized controlled trial |
| SCT | Social cognitive theory |
| PRE | Professional research expert |
| CE | Clinical expert |
| CVI | Content validity index |
| COSMIN | The Consensus-Based Standards for the Selection of Health Measurement Instruments |
| STROBE | The Strengthening the Reporting of Observational Studies in Epidemiology |
| PCA | Principal component analysis |
| PC | Principal component |
| CV | Coefficient of variation |
| ANOVA | Analysis of variance |

# List of Original Publications

This dissertation is based on the following original publications, which are referred to in the text by their Roman numerals:

I Korhonen, J., Axelin, A., Grobler, G., & Lahti, M. (2019). Content validation of Mental Health Literacy Scale (MHLS) for primary health care workers in South Africa and Zambia ─ a heterogeneous expert panel method. Global Health Action, 12(1), 1–11. https://doi.org/10.1080/16549716.2019.1668215

II Korhonen, J., Axelin, A., Katajisto, J., & Lahti, M. (2022). Construct validity and internal consistency of the revised Mental Health Literacy Scale in South African and Zambian contexts. *Nursing Open*, *9*(2), 966–977. https://doi.org/10.1002/nop2.1132

III Korhonen, J., Axelin, A., Stein, D. J., Seedat, S., Mwape, L., Jansen, R., Groen, G., Grobler, G., Jörns-Presentati, A., Katajisto, J., Lahti, M., & Team, M. C. (2022). Mental health literacy among primary healthcare workers in South Africa and Zambia. *Brain and Behavior*, *n/a*(n/a), e2807. https://doi.org/https://doi.org/10.1002/brb3.2807

# 1 Introduction

Shortages in mental health care significantly impact the Sub-Saharan African (SSA) region (World Health Organization, 2021a). Recent estimates indicate that nearly a quarter of the world's children live in Sub-Saharan Africa, where mental health conditions place great pressure on already limited economic resources (GBD 2019 Mental Disorders Collaborators, 2022; Jorns-Presentati et al., 2021). This is further intensified by population growth, conflict, and violence, which increase risk factors for mental health issues (Davis Weaver et al., 2025). While mental disorders are not exclusive to low-resource settings, their prevalence is projected to rise significantly in these regions according to current forecasts (Davis Weaver et al., 2025; Gouda et al., 2019). This trend will undoubtedly have global repercussions, including mass displacement and economic instability.

Considering that SSA is among the poorest regions in the world by multiple indicators, studies have shown a strong correlation between health literacy and improved socio-economic status and life outcomes (Sørensen et al., 2015). Mental health literacy (MHL) encompasses all actions that support and promote mental well-being at both individual and community levels (Jorm, 2019). Initially, MHL was primarily developed as a tool to elevate mental health care to the same level of priority as somatic healthcare (Jorm, 2012; Kutcher et al., 2016). Crucially, MHL is not merely about recognising mental disorders but also understanding the factors that contribute to positive mental well-being (Jorm, 2019; Kutcher et al., 2016).

PHC is key to better success and health capital. Strong primary healthcare (PHC) is recognized as a cost-effective pillar of society, with widespread effects on the population. (World Health Organisation, 2025.) PHC workers play a crucial role in addressing societal mental health-related disparities, as they serve as cultural interpreter and frontline health providers within their communities (Atilola, 2016; Mwape et al., 2010). MHL can be regarded as a critical resource in PHC (Atilola, 2016). Inadequate MHL among healthcare providers can significantly impact the quality of care delivered and the likelihood of patients receiving appropriate treatment (Ganasen et al., 2008). In this study, PHC workers encompass various professional groups, with the main research focusing on registered or enrolled nurses and clinical officers.

Previous studies have identified substantial gaps in MHL across SSA, which have hindered the integration of mental health services into primary care (Abd Rahim et al., 2021). Key challenges include stigma, negative attitudes towards mental health patients, and insufficient training among healthcare providers (Abd Rahim et al., 2021; Kapungwe et al., 2011; Mwape et al., 2010). However, evidence suggests that targeted educational interventions can improve MHL among PHC professionals, thereby enhancing mental health service delivery (Moll et al., 2018).

The concept of MHL has been critiqued for being rooted in Western scientific thought (Jorm, 2012), despite mental health being a fundamental aspect of all cultures. Although there is a well-documented need for mental health interventions in SSA, the majority of global funding for mental health research and infrastructure is directed towards wealthier nations, exacerbating health inequalities. (World Health Organization, 2021a). Within SSA, mental health research and related infrastructure receive some of the lowest levels of funding globally (World Health Organization, 2021a). This disparity has been widely criticized (Sankoh et al., 2018), given that over 80% of individuals affected by mental health disorders reside in low- and middle-income (LMIC) countries (Rathod et al., 2017).

Consequently, the dominance of Western perspectives and the resulting imbalance in mental health research and development shape how mental health is understood and conceptualized. This underscores the urgent need to move beyond Western terminology and ways of thinking towards approaches that are more multicultural and co-productive (Akomolafe, 2012; Alemu et al., 2023).

I am a registered nurse, hold a Master's degree in Health Sciences, and serve as a senior lecturer at Turku University of Applied Sciences. I have nearly twenty years of clinical and academic experience in mental health care, psychiatric care, and substance abuse treatment. As part of my professional role, I have participated in multiple global mental health research consortia across Africa, Asia, and Europe, contributing to the development of mental health education. This work includes health science research publications. Based on my experience, I have observed that while mental health challenges are universal, addressing them necessitates cultural sensitivity and context-specific approaches. Improving mental health in low-resource settings is a global issue. In Africa and beyond, difficult living conditions and poor health often push people to seek care elsewhere, which adds pressure to national health systems (Lokotola et al., 2024).

This study aims to assess the psychometric properties of a MHL instrument and to examine MHL and its determinants among PHC workers in SSA. The research is part of an international health sciences and nursing study and is embedded within a broader EU-funded capacity-building, which has been well suggested for enhancing mental health competencies in PHC (Esponda et al., 2020).

The need for global research on MHL is critical in closing the mental health treatment gap in LMICs (Sweetland et al., 2014). A deeper understanding of MHL can inform the development of effective nursing interventions (Jorm, 2015). Moreover, as health literacy may be associated with improved economic prosperity (Kickbusch et al., 2013), this research aligns with the political interests of African Union and the EU, as it addresses sustainable development challenges that may hinder improvements in living conditions and, consequently, regional economic success (European Commission, 2023). However, research conducted in LMIC regions must adhere to ethical standards to ensure that its benefits outweigh any potential harm to local populations.

The expected outcomes of this doctoral research focus on improving mental health nursing education and deepening the understanding of challenges in mental health care. This dissertation summary presents the research background (Chapter 2) and an integrative review of previous MHL studies in the region (Chapter 3), followed by the key methodology and results of the doctoral research (Chapters 4–5). Finally, the discussion, conclusions, and recommendations for future research are outlined in Chapters 7–8.

# 2 Background

The purpose of the background section is to provide an overview of the study's context. It establishes the knowledge base for the study, highlights the relevance of the issue, and outlines the research needs and existing knowledge gaps (Sudheesh et al., 2016). This background section examines the factors influencing MHL and care in SSA within the context of PHC.

## 2.1 The state of mental health care in Sub-Saharan Africa

SSA is one of the world's largest and least developed regions, comprising 48–50 countries, depending on the source (The World Academy of Sciences & Unesco, 2025; World Bank Group, 2025). The World Bank administratively recognises 48 countries in Sub-Saharan Africa (SSA). This study considers SSA as a geographical region (Figure 1) and highlights it as one of the EU's priority areas (European Commission, 2025), in line with the United Nations' Sustainable Development Goals to promote sustainable and inclusive recovery.

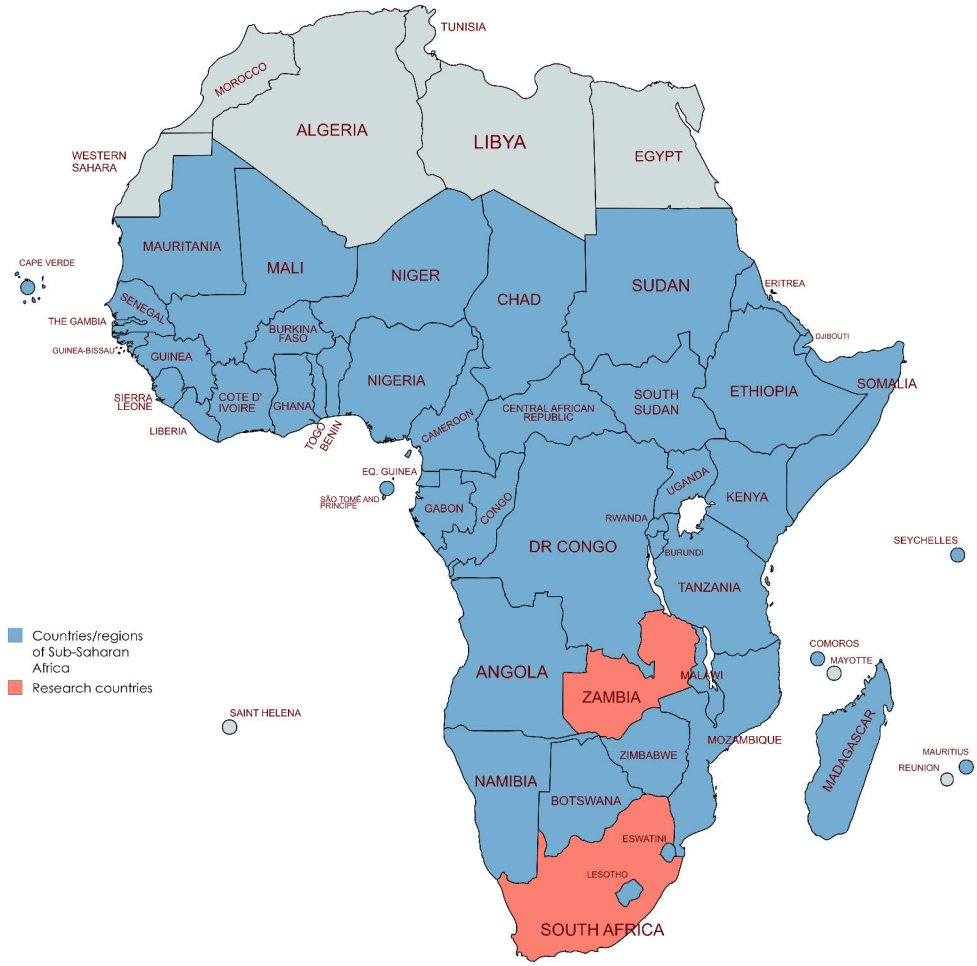



**Figure 1**. Sub-Saharan countries and regions. Created with mapchart.net under Creative Commons Attribution-ShareAlike 4.0 International License (CC BY-SA 4.0).

SSA healthcare faces significant socioeconomical challenges. Healthcare in the region is among the least developed, with the population of 1.2 billion (World Bank Group, 2025) affected by multiple severe crises, including political conflicts, poverty, malnutrition, and chronic diseases, as well as a general lack of resources. Roughly one-third of the population in the region has access to safe drinking water, while less than a quarter has sufficient sanitation and hygiene facilities (The UN-Water SDG 6 Data Portal & United Nations, 2025). The region is burdened by inadequate healthcare infrastructure and prevalent tropical and chronic diseases, such as HIV/AIDS, tuberculosis, and malaria (United Nations, 2025a).

The mental health crisis in SSA remains evident. The mental health gap in the region is significant (Gouda et al., 2019), and particularly when combined with other chronic diseases, children's mental health challenges represent some of the most critical global sustainable development issues (Jorns-Presentati et al., 2021). For example, suicide-related mortality rates are among the highest in the world, with cases occurring at younger ages than elsewhere (Davis Weaver et al., 2025). The likelihood of child mortality is 16 times higher compared to developed countries (United Nations, 2025b).

Population growth and infrastructure challenges create urgent healthcare needs. Recent research indicates that as the population in the SSA region highly increases, infrastructure resources, including healthcare and education, will need to be tripled (Ezeh et al., 2020). Therefore, various political actors and organizations have prioritized the African region to better address the health gap (European Commission, 2025; Unesco, 2025; United Nations, 2025a).

Integrating mental health care into public PHC could play a key role in service development in the area (Esponda et al., 2020). Efforts have been already made to mitigate the mental health gap and reduce the burden, particularly through the integration of mental health into PHC, due to its cost-effectiveness (Abd Rahim et al., 2021; World Health Organization, 2021a). However, studies have identified several governance issues as key challenges. These include leadership deficiencies, a lack of professional advocacy for mental health, insufficient transparency in decision-making, low prioritisation, inadequate funding, and a shortage of human resources and mental health-related training for PHC workers (Abd Rahim et al., 2021; Munakampe, 2020). Factors are also linked to the high turnover of nurses (Abd Rahim et al., 2021).

### 2.1.1 Mental health service provision in South Africa

In the SSA region, South Africa is somewhat more prosperous and classified as an upper-middle-income country. Mental health issues place a significant burden on South African society, which now consists of more than 63 million people (World Bank Group, 2023a) The PHC system remains under-resourced to effectively address these challenges (Shisana et al., 2024; Sorsdahl et al., 2023).

A recent global study on mental health across 71 countries ranked South Africa among the worst performers (Sapien Labs, 2024). The lifetime prevalence of mental health disorders has been notably high (Stein et al., 2008), and the COVID-19 pandemic significantly exacerbated depression rates across the country (Santomauro et al., 2021). It is estimated that approximately 30% of individuals will experience a mental health disorder at some point in their lives (Jack et al., 2014), with around

16% experiencing one within a 12-month period (National Department of Health. Republic of South Africa., 2023).

PHC is a crucial but vulnerable component of healthcare in South Africa (Marais & Petersen, 2015). It serves as the first point of contact for individuals in need (National Department of Health. Republic of South Africa., 2023), and approximately 80% of the population relies on public healthcare services (Sorsdahl et al., 2023). According to the National Department of Health of South Africa, the PHC system is designed to reduce exclusion and health disparities. It aims to be people-centered, intersectoral, and collaborative while encouraging the participation of all stakeholders (National Department of Health. Republic of South Africa., 2023). However, World Health Organisation (2019) data shows that South Africa has only 1.5 psychiatrists per 100,000 people in 2016. De Kock & Pillay (2016) calculated just 0.68 mental health nurses working in public rural PHC settings.

The latest Mental Health Policy Framework of South Africa continues to emphasise the urgent need to train general healthcare staff and transition towards community-based and primary care integration. Despite multiple policy contributions, South Africa faces a critical shortage of mental health training for healthcare professionals, which has hindered the effective integration of mental health services within PHC (Marais & Petersen, 2015). From a frontline perspective, mental health nursing in South Africa is recognized as a highly demanding profession, largely due to resource shortages, emotional strain, and extensive clinical responsibilities (Alburquerque-Sendín et al., 2018; South African Nursing Council (SANC), 2020).

### 2.1.2 Mental health provision in Zambia

According to the World Bank classification, Zambia belongs to the lower-middle-income category. Of Zambia's population of approximately 21 million people, a significant majority (64%) live in poverty. The population has doubled in just over a decade (World Bank Group, 2023b).

As is typical for the region, mental health care in Zambia faces significant challenges, particularly due to insufficient funding, a lack of human resources, poor infrastructure, and stigma. Addressing mental health issues has not been a priority in political decision-making (Munakampe, 2020). The prioritization of mental health at the policy level has been struggling for years due to outdated legislation and slow policy development (Mwanza et al., 2011). Additionally, the share of mental health research remains low.

However, the Mental Health Act (Act No. 6) was introduced in Zambia in 2019, when mental health research accounted for only 3% of total research in the country (World Health Organization, 2021b). The Mental Health Act, 2019, aims to

safeguard the fundamental rights of individuals facing mental health challenges and clarify standards of care and treatment, which fall under the National Mental Health Council.

Zambia faces a severe shortage of mental health professionals, particularly nurses and doctors. For instance, the number of psychiatrists in the mental health sector was 0.06 per 100,000 people in 2016, whereas in Finland, the corresponding figure was 23.59 in 2017. Similarly, the number of mental health nurses in Zambia was 1.4 per 100,000 people, compared to approximately 52 per 100,000 in Finland (World Health Organisation, 2019). Overall, fewer than 800 professionals provide mental health care for the country's millions of inhabitants, with nurses making up the majority (World Health Organization, 2021b).

Consequently, the work of mental health nurses in Zambia can be particularly burdensome. The COVID-19 pandemic further increased mental distress among nurses, as expected (Mwape et al., 2022).

## 2.2 Promoting mental health literacy in South African and Zambian healthcare settings

The original concept of MHL has been defined as 'knowledge and beliefs about mental disorders which aid their recognition, management, or prevention,' reflecting the needs of healthcare (Jorm, 2019; Jorm et al., 1997). Since the original formulation of the concept, MHL has come to be understood as encompassing several components that are essential for ensuring proper mental health care. These include (Jorm, 2012): (a) knowledge of how to prevent mental disorders, (b) the ability to recognise mental illnesses, (c) knowledge of help-seeking options and available treatments, (d) knowledge of effective self-help strategies for milder problems, and (e) first aid skills to support people experiencing mental health challenges.

Besides help-seeking efficacy and understanding of the clinical aspects of mental health care, Kutcher et al. (2016) highlight the proactive role of the concept, which includes understanding how to obtain and maintain positive mental health, as well as how to reduce attitudes that promote stigma. Consequently, mental health-literate professionals are required to possess a broad range of knowledge and skills to support the mental health of the population.

Various interventions, such as training PHC workers in MHL, have been implemented in the SSA region for some time (Ganasen et al., 2008). Nevertheless, limited access to training and resources, together with low MHL, have been common barriers to mental health programmes in PHCs of LMICs (Esponda et al., 2020). This is also the case in South Africa and Zambia. In these countries, the lack of resources affects the training of mental health professionals (Marais & Petersen, 2015;

Munakampe, 2020), which in turn contributes to negative attitudes and stigma towards mental health, both among PHC workers (Kapungwe et al., 2011; Munakampe, 2020) and within communities (Mwanza et al., 2011).

Research on MHL has been characterised by the diversity in defining the concept and the lack of validated instruments to measure its attributes (Jorm, 2019; O'Connor et al., 2014). Validated MHL measurement tools are needed to assess the educational needs of nursing in various operational environments (Kutcher et al., 2016). To address challenges in promoting MHL, research and resources should be tailored to the culturally diverse context of SSA, and targeted educational interventions should be implemented.

### 2.2.1 Description of the MEGA-project

This study was conducted as part of the MEGA project (2017-2021, extension) (EACEA No: 585827-EPP-1-2017-1-FI-EPPKA2-CBHE-JP), a broader European Union-funded Erasmus+ Capacity Building initiative. The project brought together higher education institutions (HEIs) and PHC practitioners from three European countries (Finland, Germany, Latvia) and two African countries (South Africa, Zambia).

Over three years, MEGA aimed to address the global challenge of mental health care by developing a training package aligned with the WHO's mhGAP Intervention Guide (mhGAP-IG) and a mobile application for mental health screening of children and adolescents in the SSA region. The focus was on frontline PHC workers, who encounter mental health challenges among children daily.

MEGA's objectives were structured around four key aims (Lahti et al., 2020):

1) *Assess* the MHL of PHC practitioners to identify areas requiring development.
2) *Develop* a culturally relevant m-health application for screening youth mental health conditions.
3) *Implement* and *evaluate* a tiered education and training programme on using a m-health application, assessing its uptake and acceptability among trainers and PHC workers.
4) *Examine* the feasibility and effectiveness of the m-health application in real-world PHC settings across South Africa and Zambia.

This study aimed to assess MHL among PHC workers to identify key areas for improvement and educational needs for MEGA (aim 1).

# 3 Review of the Literature

The purpose of this literature review is to provide a comprehensive overview of previous research and critically evaluate the evidence (Sudheesh et al., 2016) related to MHL and its application in research and nursing settings. The review aims to assess MHL among PHC workers in the SSA region. The guiding research questions are as follows: What kind of concepts have been used to address MHL in SSA research? 2) What is the current level of MHL among PHC workers in SSA? 3) What are the key factors influencing MHL among PHC workers in SSA? 4) What strategies or interventions have been implemented to improve MHL among PHC workers in SSA, and what are their outcomes?

## 3.1 Methods for the literature review

The review followed an integrative review format, comprising problem identification, literature review (data collection), data evaluation and analysis, and presentation of findings (Whittemore & Knafl, 2005). The primary target group was PHC professionals, such as nurses, midwives, and clinical officers. The inclusion criteria required that studies: 1) involved PHC workers in SSA, and 2) addressed the MHL of PHC workers or the factors influencing it, or 3) discussed PHC perspectives, strategies, or interventions to improve MHL (e.g., training programmes, workshops, educational materials). Articles that focused on specialised nursing fields were excluded. Additionally, articles that focused solely on factors related to the patient's MHL were also excluded. The PRISMA flow diagram (Page et al., 2021) was used as a guiding tool, along with the CASP (Critical Appraisal Skills Programme 2023, a Systematic Review Checklist) for quality assessment.

This integrative literature review (Whittemore & Knafl, 2005) was conducted by performing a systematic literature search across full-text databases of recent research (CINAHL with EBSCOHost, Scopus, PubMed/Medline, Cochrane, PsychINFO/PsycArticles, and Web of Science) covering the past 20 years. This search was supplemented with manual searches and theoretical findings to gain a comprehensive understanding of MHL in the SSA context. A total of 59 articles were selected for in-depth review at the full-text level, with $n = 40$ (39+1) publications included in the final analysis. One article was included through a manual search

based on the inclusion criteria. $N = 20$ articles were excluded because full texts were unavailable or they did not address the specified research questions. The majority of excluded articles lacked a PHC perspective. Specialised search strategies conducted on the databases are detailed in Appendix 1.

## 3.2 Summary of the literature review

Findings of this review indicated that studies on MHL in the SSA region have clearly increased in recent years. A common theme in the articles reviewed in this overview is the development of MHL, the integration of mental health care into PHC and related infrastructure, the need for professional education to support MHL, and the existing positive attitudes and interest in mental health promotion across several areas of PHC. Overall, the development of action programs, metrics, and screening tools, along with their continuous training, may lead to significant improvements in attitudes, knowledge, and recognition of MH issues based on research results. It is noteworthy, that studies indicate a diverse group of healthcare workers operate in the PHC environment in SSA, which must be considered in the development of MHL-related training. The literature review also showed that specialized areas in PHC, such as maternal mental health and HIV care, present unique challenges to supporting MHL among PHC professionals in the region.

As a general limitation, due to the relatively recent nature of the research topic and publication years, older studies may have been limited by a lack of comparative data in relation to their findings, as discussed by (Ayano et al., 2017). Other research limitations include the lack of experimental designs, particularly RCT studies. Additionally, sample sizes within the population were sometimes small. On the other hand, the region has a relatively small group of researchers, and the literature featured similar studies and data fragmentation from the same population. In some studies, there were also participants beyond the PHC sector.

## 3.3 Characteristic of studies

### 3.3.1 Study population

The studies (N = 40) were conducted across 15 different countries in Sub-Saharan Africa (Ethiopia, South Africa, Kenya, Nigeria, Uganda, Tanzania, Ghana, Liberia, Senegal, Malawi, Cameroon, Sudan, Mozambique, Zambia, Somaliland) between 2009 and 2023. The majority, just under 80% (n = 31), were conducted from 2017 up until 2024. Most of the studies were from Ethiopia (n = 7). The annual and cumulative publication numbers are presented in Figure 2.

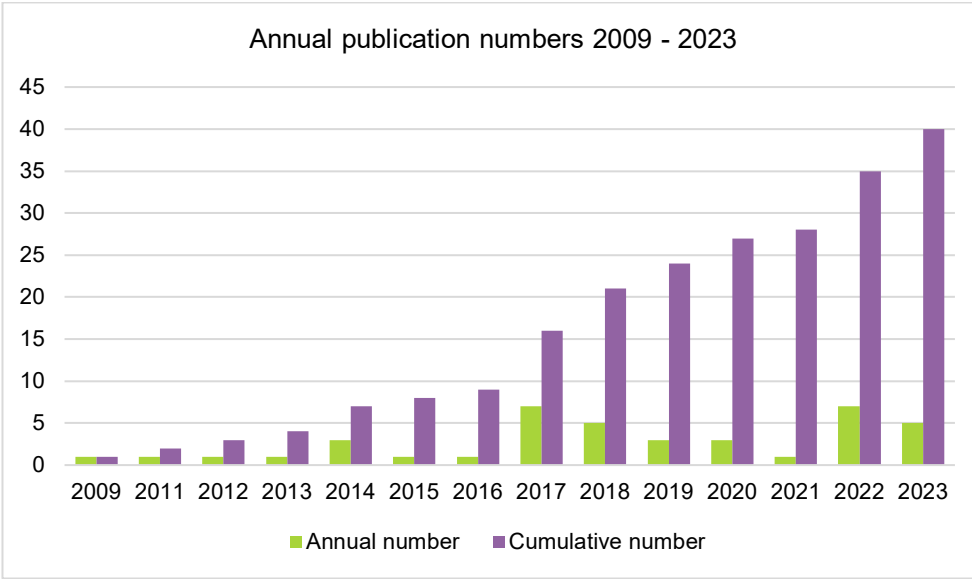



**Figure 2**. Annual distribution of mental health literacy studies in Sub-Saharan Africa.

The study participants, primarily mixed group of PHC workers, had diverse backgrounds. To support the perspectives of professional staff, community-based PHC representatives, such as community health workers (Chu et al., 2022; Grant et al., 2022; Mabunda et al., 2022; Monteiro et al., 2014; Nyassi et al., 2023; Sibeko et al., 2018) community health extension workers (HEWs), and other related roles in communities (Adewuya et al., 2017; Mosaku & Wallymahmed, 2017; Tesfaye et al., 2022; Tilahun et al., 2017, 2019), were also included, as studies highlighted their clear role in PHC and mental health promotion. Midwives were well represented in several studies (Adewuya et al., 2017; Adjorlolo et al., 2019; Adjorlolo & Aziato, 2020; Gwaikolo et al., 2017; Kutcher et al., 2017; Monteiro et al., 2014; Nakidde et al., 2023; Nakku et al., 2016; Rukundo et al., 2022; Wakida et al., 2018) especially in relation to maternal mental health. Other PHC professionals included nurses with various educational backgrounds, who formed the majority of the population, as well as medical representatives like general practitioners, pharmacy attendants, HIV/AIDS service providers, patient advocates, counselors, and mental health specialists, in addition to non-specialist providers. The participants also represented a wide range of other stakeholders, including service users, traditional healers, and policy makers, alongside PHC representatives. These findings indicate that a great diverse segment of the population is involved in supporting MHL and participating in PHC patient care. Country profiles and demographics of literature are presented in table 1.

**Table 1.** Country profiles and demographics of literature.

| *SSA Country (N = 15)* | *n* | *Authors and years conducted (2009-2023)* | *Description of the population* |
|---|---|---|---|
| *Ethiopia* | 7 | Abera et al., 2014; Ayano et al., 2017; Hanlon et al., 2020; Mekonen et al., 2022; Tesfaye et al., 2022; Tilahun et al., 2017, 2019 | Health extension workers, mixed groups of PHC workers and Heads of facilities. |
| *South Africa* | 6 | Egbe et al., 2014; Gerber, 2018; Grant et al., 2022; Mall et al., 2012, 2013; Sibeko et al., 2018 | Community health workers, health service providers and users, adherence counselors, patient advocates, antiretroviral nurses, and physicians working in HIV/AIDS primary, mixed PHC workers (i.e nurses, doctors, social workers) |
| *Kenya* | 5 | Bitta et al., 2019; D'Orta et al., 2022; Marangu et al., 2021; Mendenhall et al., 2018; Mutiso et al., 2017 | Mixed professional (including medical doctors, clinical officers, nurses), traditional health practioners, community health volunteers |
| *Nigeria* | 5 | Adewuya et al., 2017; Chu et al., 2022; Gureje et al., 2015; Mosaku & Wallymahmed, 2017; Oladeji et al., 2023 | PHC workers, including community health extension workers, community health officers, nurses, midwifes, primary care doctors, mental health specialists, state health officials |
| *Uganda* | 5 | Johnson et al., 2009; Nakidde et al., 2023; Nakku et al., 2016; Rukundo et al., 2022; Wakida et al., 2018 | Village health team members, pregnant and postpartum women (within one year of delivery), midwives, general nurses and health managers, clinical officers, medical doctors, traditional healers, and mental health professionals |
| *Tanzania* | 2 | Knettel et al., 2023; Kutcher et al., 2017 | Clinical officers; nurses (registered nurses and midwives) and other community healthcare providers, nurses in HIV clinics |
| *Ghana* | 2 | Adjorlolo et al., 2019; Adjorlolo & Aziato, 2020 | PHC nurses and midwifes |
| *Liberia* | 1 | Gwaikolo et al., 2017 | Multiple PHC workers, organization representatives, service users and a family member, stakeholders (including religious leaders, a police officer) |
| *Senegal* | 1 | Monteiro et al., 2014 | Health workers' (physicians, nurses, midwives, community health workers) and policymakers' |
| *Malawi* | 1 | Ahrens et al., 2020 | 500 non-specialist healthcare workers |
| *Cameroon* | 1 | Mulango et al., 2018 | General practitioners, nurses, pharmacy attendants and social workers |
| *Sudan* | 1 | Mokhtar Ahmed et al., 2023 | Physicians |
| *Mozambique* | 1 | Mabunda et al., 2022 | Community health workers |
| *Zambia* | 1 | Kapungwe et al., 2011 | Clinical officer general, clinical officer psychiatrist, registered nurses and mental health nurses, enrolled nurses and psychiatric Nurses |
| *Somaliland* | 1 | Nyassi et al., 2023 | Female community health workers, medical doctors, and registered nurses |

**Note.** Abbreviations: PHC = Primary healthcare; MHL = Mental health literacy; SSA = Sub-Saharan Africa; MHLS = Mental Health Literacy Scale

### 3.3.2 Study settings and designs

The methods used in the studies included both qualitative and quantitative research through various surveys and interviews, as well as mixed method. The study designs included several cross-sectional studies, cohort studies, and educational interventions. Although none of the studies were RCTs, they included quasi-experimental designs, such as pre- and post-study designs. Data collection was conducted using a wide range of methods, including structured and semi-structured questionnaires, screening tools, validated scales, training evaluations, self-reports, and interviews. None of the studies used a measure that would encompass the broader concept of MHL. However, Marangu et al. (2021) conducted research using Jorm's Mental Health Literacy tool, supported by complementary vignettes.

## 3.4 Conceptualisation of mental health literacy in Sub-Saharan research

The articles included in the review addressed MHL or its various attributes, such as attitudes toward mental health, knowledge and skills, disease recognition, health maintenance, and stigma. The concept of MHL was directly addressed in a total of nine articles (D'Orta et al., 2022; Grant et al., 2022; Kutcher et al., 2017; Mall et al., 2012, 2013; Marangu et al., 2021; Mekonen et al., 2022; Nakku et al., 2016; Tesfaye et al., 2022). A parallel concept to MHL, the Knowledge, Attitudes, and Practices (KAP) framework, was also discussed in some articles (Ayano et al., 2017; Kapungwe et al., 2011; Mokhtar Ahmed et al., 2023; Mulango et al., 2018). Generally, the studies focused on diagnostic capabilities, knowledge, and attitudes towards mental health issues. Approximately one-quarter of the articles investigated MHL among PHC workers in the context of identifying and managing severe mental health disorders, including depression, substance use disorders, and schizophrenia (Adewuya et al., 2017; Ayano et al., 2017; Egbe et al., 2014; Hanlon et al., 2020; Johnson et al., 2009; Kutcher et al., 2017; Mall et al., 2013; Marangu et al., 2021; Mokhtar Ahmed et al., 2023; Mulango et al., 2018; Oladeji et al., 2023). Only a few articles addressed the concept of MHL by also discussing on professionals' individual health-promoting actions or help-seeking behavior (Kutcher et al., 2017; Marangu et al., 2021). Thus, the broader definition of the concept was limited in the literature.

## 3.5 Mental health literacy levels among primary healthcare workers in Sub-Saharan Africa

### 3.5.1 Knowledge, attitudes and stigma

The studies observed a lack of MHL (MHL), particularly regarding knowledge gaps, negative attitudes, and the prevalence of stigma both among the public and within PHC workers themselves (Abera et al., 2014; Adjorlolo & Aziato, 2020; D'Orta et al., 2022; Egbe et al., 2014; Gerber, 2018; Gwaikolo et al., 2017; Kapungwe et al., 2011; Mall et al., 2012, 2013; Marangu et al., 2021; Nakku et al., 2016; Tesfaye et al., 2022; Tilahun et al., 2017; Wakida et al., 2018). Overall, gaps in MHL were clearly evident, for example, in the neglect of care and the fear surrounding patients suffering from mental health conditions, thereby endangering their willingness to seek treatment (Egbe et al., 2014; Mekonen et al., 2022).

An adequate understanding of mental illnesses was notably lacking in some cases. For instance, in the study by Tilahun et al. (2017), more than half of the community health extension workers reported insufficient knowledge related to managing children's mental health. Similarly, Tesfaye et al. (2022) found that half of the respondents demonstrated poor knowledge of mental health disorders and held negative attitudes towards them. These deficiencies were particularly evident in recognizing both severe and common mental health disorders, such as depression (Marangu et al., 2021). Some healthcare professionals hesitate to disclose a diagnosis to patients due to uncertainty or lack of knowledge (Mekonen et al., 2022), and lack of competence significantly correlated with professionals' involvement in the care of these patients (Adjorlolo et al., 2019) .

In examining attitudes, the treatment of mental health disorders was often perceived as uncomfortable. In the article by Mulango et al. (2018), the majority (66%) found treating patients with depression to be unpleasant. D'Orta et al. (2022) evaluated various professional groups in the PHC sector, highlighting highly negative attitudes towards mental health issues, a lack of MHL, and associated professional stigma. These challenges were evident in training. Additionally, two-thirds of the health extension workers in the study perceived patients with mental health conditions as dangerous (Tesfaye et al., 2022). Overall, stigma remains a prominent issue in mental health care within PHC in SSA, and it also affects caregivers (Gwaikolo et al., 2017; Mabunda et al., 2022). It has further been identified as a key barrier to integrating mental health care into PHC settings (Chu et al., 2022), despite PHC integration being recognised as a major area for development.

Prejudices were at times reflected in violent behaviour towards patients in PHC units (Egbe et al., 2014) and authoritarian attitudes (Mall et al., 2013). Kapungwe et al. (2011) found that slightly fewer than half of PHC workers supported restrictive

measures such as the use of handcuffs, isolation, and medical sedation. However, these attitudes were significantly more prevalent among a specifically trained group, clinical officer psychiatrists. An interesting demographic observation was also made in the study by Mosaku & Wallymahmed (2017), who didn't find significant difference in professional position, but authoritarian attitudes were milder among more experienced nurses. Adjorlolo & Aziato (2020) reported that male professionals and more experienced workers reported fewer MHL-related barriers.

In a study by Mutiso et al. (2017), education appeared to influence the results, with mental health-related stigma and limited knowledge being more pronounced among less formally educated community health volunteers than PHC workers. However, when other background variables were taken into account, this difference became less evident. Interestingly, a strong sense of belonging to the community was found to potentially reduce the willingness to engage with people experiencing mental health problems.

### 3.5.2 Positive attitudes supporting professional development

Studies also highlighted positive findings regarding MHL and benevolent attitudes (Mabunda et al., 2022; Mosaku & Wallymahmed, 2017; Mutiso et al., 2017; Nyassi et al., 2023). Despite the presence of stigma, there was clear interest in improving mental health care (Abera et al., 2014; D'Orta et al., 2022; Monteiro et al., 2014; Tilahun et al., 2017). Moreover, caring for individuals with mental health conditions was perceived as both rewarding and a professional duty, despite its demanding nature (Nyassi et al., 2023).

The motivation for mental health training was promising. For instance, in study by Adjorlolo et al. (2019), up to 94% of participants expressed particular interest in training related to (maternal) mental health.

Mutiso et al. (2017) found that positive attitudes were also a predictor of higher levels of competence. According to Marangu et al. (2021), the majority of the study population, comprising registered nurses and doctors in PHC facilities believed that individuals with mental illness are capable of being good parents, maintaining successful marriages, and demonstrating empathy towards others.

Despite gaps in MHL, studies indicated that both patients and PHC workers were able to recognise the need for professional development (Nakku et al., 2016). In Mendenhall's et al. (2018) study, nurses perceived mental health as a high priority and considered PHC involvement and integration beneficial, particularly in terms of administrative and resource-related support. Similarly, Mabunda et al. (2022) suggested that community health workers displayed a positive attitude, saw themselves as ready to provide care for severe mental illnesses, and were open to

receiving training for this additional role. Likewise, Rukundo et al. (2022) observed similar positive attitudes among PHC workers.

## 3.6 Key factors influencing mental health literacy among primary healthcare workers in Sub-Saharan Africa

### 3.6.1 Cultural beliefs and traditional healing

The impact of community beliefs on the PHC environment was clearly highlighted in studies (Adewuya et al., 2017; Johnson et al., 2009; Mekonen et al., 2022). For instance, the attitudes of PHC workers were found to be largely aligned with those of the general population (Johnson et al., 2009; Mosaku & Wallymahmed, 2017). This was particularly evident in studies examining traditional beliefs and cultural factors influencing mental health care.

In some regions, a large proportion of participating health professionals relied on traditional healing methods, while knowledge based on a Western medical perspective was generally less prevalent. In the study by Tesfaye et al. (2022) a quarter of respondents stated that mental health disorders should be treated by a witch doctor. Similarly, in another Ethiopian study (Abera et al., 2014) slightly less than half of the participants believed that supernatural causes were the primary reason for mental health challenges. Conversa, Bitta et al. (2019) found that PHC workers were not highly motivated to collaborate with traditional healers, fearing it might negatively impact the progression of the illness.

Studies indicated that PHC plays a deeply integrated role in fostering mental health care within the African context and culture. Research highlighted the potential of PHC workers, who serve not only as healthcare providers but also as cultural experts in mental health matters within their communities (Monteiro et al., 2014). Additionally, the role of traditional healers as potential stakeholders in the healthcare system was recognised (D'Orta et al., 2022; Mabunda et al., 2022). Mall et al. (2013) further observed how beliefs and traditional values influence the interpretation of mental health challenges and their treatment through traditional healing practices.

Overall, the connection between the community, families, and friends with PHC emerged as an important factor in reducing stigma and improving MHL (Egbe et al., 2014).

### 3.6.2 Lack of resources and infrastructure

The MHL of PHC workers is closely linked to available resources, which directly impact the treatment of mental health patients. These limited resources show up in

various ways, such as heavy workloads, lack of training, poor treatment practices, and the prioritisation of other healthcare duties (Wakida et al., 2018).

A qualitative analysis by Mekonen et al. (2022) highlighted that due to an overburdened healthcare system and various attitude-related factors, PHC centers were not perceived as appropriate settings for mental health care. As a result, nurses often avoided engaging with mental health patients and their treatment. Similar discomfort among PHC workers was also observed in the findings of Mokhtar Ahmed et al. (2023).

Despite these challenges, studies have also documented PHC workers' willingness to support mental health care. Adewuya et al. (2017) found that nearly 90% of PHC workers (n = 607) believed they could treat mental health patients effectively if resources were improved. However, this willingness was held back by major structural and resource challenges, such as staff shortages, poor diagnostic methods, difficulties with task-sharing, limited capacity to grow the mental health workforce at the PHC level, and lack of training (D'Orta et al., 2022; Mendenhall et al., 2018).

Weak healthcare infrastructure makes MHL-related problems worse. Many low-resource countries struggle to develop treatment practices, care plans, and mental health infrastructure, and these gaps remain largely unaddressed (D'Orta et al., 2022; Mekonen et al., 2022).

Screening methods, which are essential for early identification and treatment, are also underutilized (Mulango et al., 2018). In a study by Adjorlolo & Aziato (2020), three-quarters of nurses (n = 309) reported limited engagement in mental health care, citing the absence of clear treatment pathways or protocols. Similarly, Mulango et al. (2018) found that fewer than 2% of respondents were aware of standardized tools for diagnosing depression. Wakida et al. (2018) also highlighted challenges related to clinical guidelines and screening tools, noting that many healthcare staff found them impractical and lacked confidence in treating mental health conditions. Moreover, awareness of the availability and accessibility of psychotropic medications was low (Gwaikolo et al., 2017; Mulango et al., 2018).

A qualitative study by Gwaikolo et al. (2017) identified multiple resource constraints, including high workloads that limited PHC workers' ability to take on mental health responsibilities. Many health facilities also lacked proper infrastructure, such as private consultation rooms, which limited the effective delivery of mental health care.

In the SSA context, PHC integration and its associated challenges, especially inadequate mental health care resources, have been widely documented (Abera et al., 2014; Gerber, 2018; Wakida et al., 2018). These resource constraints particularly affect the treatment of specific groups, such as HIV patients and maternal health populations.

Research highlights the interconnection between HIV treatment and mental health care (Knettel et al., 2023; Mall et al., 2012, 2013). Mall et al. (2012) reported that only a small number of PHC nurses felt equipped to screen for and identify mental health disorders among people living with HIV/AIDS. Another study noted that PHC workers faced difficulties recognizing mental health conditions in general practice and understanding how patients' biological health impacted their psychological well-being in the context of HIV treatment (Mall et al., 2013).

Similar challenges were observed in maternal health care (Adjorlolo et al., 2019; Adjorlolo & Aziato, 2020; Nakidde et al., 2023; Nakku et al., 2016; Oladeji et al., 2023), raising concerns about the feasibility of task-sharing and PHC integration for both somatic and mental health disorders.

## 3.7 Strategies and interventions to enhance mental health literacy among primary healthcare workers in Sub-Saharan Africa

The data highlighted both the existence and benefits of specialised training programmes in mental health care. Numerous studies underscored the positive impact of training on MHL and clinical practices (Ayano et al., 2017; Mekonen et al., 2022; Oladeji et al., 2023; Tilahun et al., 2017, 2019).

### 3.7.1 Existing mental health development initiatives

Development programmes exist at both national and international levels. Among the key international initiatives is the Programme for Improving Mental Health Care (PRIME) (Egbe et al., 2014; Hanlon et al., 2020; Nakku et al., 2016), a research consortium operated in five LMICs with the aim of generating evidence and supporting the implementation of treatment programmes focused on priority mental health conditions. Several local projects have also incorporated the global Mental Health Gap Action Programme (mhGAP) into their frameworks (Chu et al., 2022; Sibeko et al., 2018). Similarly, mhGAP scales up services and provides evidence and training materials for mental health conditions in LMICs. Ahrens et al. (2020) reached conclusions emphasising that even minimal training could lead to improvements in attitudes, recognition, and knowledge. Studies further confirmed that training based on mhGAP had a positive effect on treatment practices (Hanlon et al., 2020).

Studies indicate that implementing mhGAP using the cascade training model has led to an increase in the provision of adequate mental health care within health units (Gureje et al., 2015). Cascade training, by distributing the responsibility for MHL training to subsequent trainers, can help reach healthcare professionals across a wide

range of communities (Kutcher et al., 2017). Overall, mhGAP has been effectively integrated into PHC-focused mental health care development initiatives (Ahrens et al., 2020; Ayano et al., 2017; Bitta et al., 2019; Gureje et al., 2015; Gwaikolo et al., 2017; Hanlon et al., 2020).

### 3.7.2 Impact of training programmes

Efforts to strengthen mental health infrastructure, treatment practices, and training programs have shown promising results. Overall, studies highlight training as a key strategy for enhancing MHL and improving care (Bitta et al., 2019; D'Orta et al., 2022) Proper training and education play a crucial role not only in improving the quality of mental health care but also in enhancing the knowledge and attitudes of PHC workers (Adewuya et al., 2017; D'Orta et al., 2022).

The cascade training model has demonstrated substantial improvements in professional MHL, for example in terms of attitudes and confidence in mental health care (Gureje et al., 2015; Kutcher et al., 2017; Oladeji et al., 2023). Kutcher et al. (2017) examined the outcomes of a Canadian-certified adolescent depression programme implemented in Tanzania using the cascade training model. Their findings demonstrated improvements in MHL within a cohort study. However, while refresher courses were considered useful, they did not significantly enhance the clinical skills of PHC workers.

Training interventions have been shown to significantly impact MHL, as evidenced by pre- and post-training evaluations (Ayano et al., 2017). Similarly, Tilahun et al., (2017, 2019) found that training clearly improved child and adolescent mental health care, especially right after the training. Tilahun et al. (2019) further noted that trained health extension workers exhibited fewer negative beliefs compared to those in the control group.

However, while knowledge is relatively easy to enhance by training, shifting attitudes remains more challenging. For instance, although training may improve cognitive and skill-related competencies, Sibeko et al. (2018) found that it had little influence on the authoritarian attitudes of nurses.

### 3.7.3 Challenges in training implementation

As indicated Several studies (Abera et al., 2014; Adewuya et al., 2017; Mokhtar Ahmed et al., 2023) have shown that prior mental health training or experience leads to improved attitudes, knowledge, and caregiving capabilities. However, the lack of adequate training remains a pervasive issue in the SSA region.

Access to training remains a significant concern, as in some cases, only a limited number of healthcare professionals have received relevant instruction (Adewuya et

al., 2017; Mokhtar Ahmed et al., 2023). For instance, Mokhtar Ahmed et al. (2023) found that in a study of 407 doctors in Sudan, fewer than 20% had received any mental health training. Expanding access to mental health-related training is therefore imperative, particularly in PHC settings, where healthcare workers come from diverse professional backgrounds.

For instance, Nakidde et al. (2023) found that educational background was a key determinant of MHL competency, with midwives reporting particular deficiencies in this area. Similarly, nurses without mental health training found it harder to carry out screenings and lacked key information skills. This could be improved by using clinical tools and protocols for identifying mental health disorder (Grant et al., 2022; Knettel et al., 2023). However, their adoption remains inconsistent, particularly in low-resource settings (Abera et al., 2014).

The need for ongoing training and refresher interventions was also emphasised, as training benefits may diminish over time (Gureje et al., 2015; Kutcher et al., 2017). Still, keeping up these efforts is challenging. Research has highlighted the very practical challenges associated with the implementation of development programs in the region. In SSA, research and implementation efforts face logistical and resource-related barriers, including theft and natural disasters (Ahrens et al., 2020), which need to be taken into account in this work.

### 3.7.4 Strategic recommendations for strengthening mental health literacy in primary healthcare

Finally, studies proposed a series of strategic recommendations to strengthen mental health training and improve service provision within PHC settings in SSA, as presented in Table 2.

**Table 2**. Strategic recommendations for strengthening mental health training and enhancing service provision in primary healthcare settings in Sub-Saharan Africa.

| | |
|---|---|
| *Increasing public awareness* | Delivering comprehensive public awareness campaigns via mass media to challenge stigma and broaden public understanding of mental health.<br>*(Egbe et al., 2014)* |
| *Implementing routine assessments* | Establishing regular mental health assessments, particularly for vulnerable populations such as women and children, to facilitate early identification and intervention.<br>*(D'Orta et al., 2022; Grant et al., 2022; Mall et al., 2013)* |
| *Strengthening collaboration between traditional healers and PHC workers* | Promoting closer engagement and structured collaboration between traditional healers and PHC workers to enhance the integration of mental health services.<br>*(Bitta et al., 2019; D'Orta et al., 2022; Monteiro et al., 2014)* |
| *Expanding access to mental health training* | *Ensuring mental health training is accessible to all healthcare professionals, fostering a multidisciplinary approach to care.*<br>*(D'Orta et al., 2022; Nakidde et al., 2023)* |
| *Enhancing healthcare infrastructure and policy support* | Upgrading healthcare infrastructure to better accommodate mental health services, ensuring facilities are equipped for effective care delivery.<br>*(Gwaikolo et al., 2017; Mekonen et al., 2022)*<br><br>Securing sustained financial investment and active engagement from policymakers and stakeholders to embed mental health training and service provision into national health strategies.<br>*(Adjorlolo et al., 2019; Nyassi et al., 2023; Oladeji et al., 2023)* |
| *Ensuring continuous professional development* | Establishing structured refresher training programmes to maintain and advance knowledge, clinical skills, and mental health competencies. over time.<br>*(Gureje et al., 2015; Kutcher et al., 2017; Oladeji et al., 2023)* |

**Note.** Abbreviations: PHC = Primary healthcare

In short, improving MHL in PHC settings across SSA depends on providing mental health education, which helps build care routines among a varied health workforce. Alongside better resources and infrastructure, cultural aspects like community involvement also play a key role.

# 4 Aims

The overall aim of this study was to assess the psychometric properties of a MHL instrument and to examine MHL and its determinants among PHC workers in SSA. The basic premise of this study is that sociocultural and professional factors, such as working conditions, training, and individual experiences, influence the MHL of PHC workers. It also assumes that MHL can be improved through educational approaches, provided that individuals' social context and environment are taken into account.

This doctoral thesis comprised three sub-studies (phases I-III), with more detailed research implementation for each sub-goal. Phase I aimed to adapt the content validity (Polit & Beck, 2006; Schilling et al., 2007) of the Mental Health Literacy Scale (MHLS) instrument (O'Connor & Casey, 2015) in collaboration with researchers and PHC workers in SSA settings, with a focus on South Africa and Zambia. Phase II evaluated the psychometric properties of the revised MHLS, focusing on its construct validity and internal consistency. Phase III then analysed the primary findings on MHL levels and related factors among PHC workers, using the revised MHLS. An overview of the study phases of this dissertation is presented in Table 3.

**Table 3**. Aims and research questions of the study phases.

| STUDY PHASE | AIM | RESEARCH QUESTIONS |
|---|---|---|
| **Phase I:** Content validation of MHLS in SSA (Korhonen et al., 2019) | To establish the content validity of MHLS in South Africa and Zambia | What kind of content validity does the MHLS demonstrate in the context of LMICs? |
| **Phase II:** Clarification of the psychometric properties of the revised MHLS in SSA (Korhonen, Axelin, Katajisto, et al., 2022) | To evaluate the construct validity and internal consistency of the revised MHLS instrument | (1) What is the construct validity of the revised MHLS in South Africa and Zambia?<br>(2) What is the internal consistency of the revised MHLS in South Africa and Zambia? |
| **Phase III:** Evaluation of MHL among PHC Workers in SSA (Korhonen, Axelin, Stein, et al., 2022) | To examine MHL and its determinants among PHC workers in South Africa and Zambia | (1) What level of MHL do PHC workers have in South Africa and Zambia?<br>(2) Which attributes of MHL are the strongest and weakest among PHC workers in South Africa and Zambia?<br>(3) What determinants influence PHC workers' MHL in South Africa and Zambia? |

**Note.** Abbreviations: PHC = Primary healthcare; MHL = Mental health literacy; SSA = Sub-Saharan Africa; MHLS = Mental Health Literacy Scale

# 5 Materials and methods

This study was conducted based on social cognitive theory (SCT) (Bandura, 1989, 1998). The choice of theory was particularly influenced by its comprehensive alignment with all key elements of SCT, which were central to structuring the research process. The theoretical framework positioned PHC workers at the core of the study, as the development and research project MEGA focused on their role in implementing changes to improve child and adolescent mental health care in SSA. Their personal motivations, values, beliefs, and knowledge were pivotal in shaping how they adopted and applied new mental health care approaches within their specific cultural and social contexts.

In this study, the determinants of MHL among PHC workers were identified through three sub-phases (original publications I, II, and III) (see Table 3). This chapter outlines the sub-constructs of the theoretical framework that guided the research, along with the research methods and settings employed in each phase of the study.

## 5.1 Theoretical and methodological approaches

The SCT framework can be examined from multiple perspectives. One well-established perspective defines SCT as a psychological approach to human functioning, emphasising the central role of the social environment in shaping motivation, learning, and self-regulation (Schunk & DiBenedetto, 2020).

This concept has been extensively discussed by Albert Bandura, the originator of SCT, who argues that the theory explains psychosocial functioning through the triadic reciprocal model. According to this model, personal factors (such as cognitive, affective, and biological influences), behavioural patterns, and environmental factors interact as interdependent determinants, exerting reciprocal influence on one another. (Bandura, 2001.) This dynamic interaction between the three elements is illustrated in Figure 3.

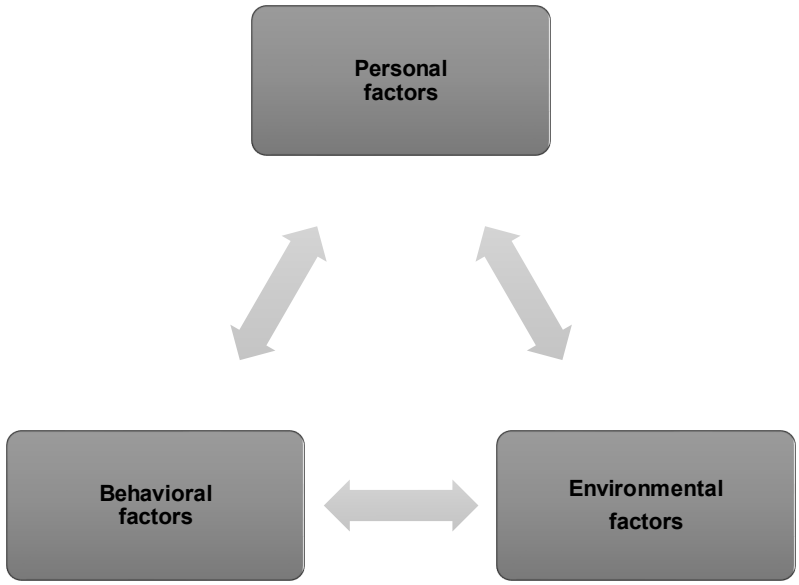



**Figure 3.** Triadic reciprocal causation of social cognitive theory (modifed from Bandura, 2001).

One of the key concepts of SCT is self-efficacy. Bandura suggests that self-efficacy beliefs determine individuals' levels of motivation, affect, and behaviour (Bandura, 1998). He emphasises that human behaviour is largely regulated by forethought, which is closely linked to previously adopted and cognitively processed goals. Furthermore, an individual's appraisal of their capabilities influences the degree to which they believe they can achieve their goals and successfully evaluate progress towards their attainment. When individuals have strong confidence in their abilities through high self-efficacy, they tend to set more ambitious goals, sustain their motivation, and demonstrate greater commitment to achieving these goals. Additionally, individuals are capable of self-regulating their motivation and their evaluative responses to their own behaviour (Bandura, 2001).

Another significant aspect of the SCT framework is the active role individuals play in the learning process. SCT conceptualises learning as a social and observational activity, rather than portraying individuals as passive recipients of information (Bandura, 1989). Active recipients set self-regulative goals and implement strategies to achieve them (Schunk & DiBenedetto, 2020).

Within this SCT framework, individuals thus function as collective agents (Bandura, 1989, 2000). Through observational learning, they use their vicarious capability to adopt cultural and social patterns informed by their environment and personal experiences (Bandura, 2001). In conclusion, SCT acknowledges the influence of broader socioeconomic conditions, family background, and other sociocultural factors, which indirectly shape an individual's behaviour.

This study falls within the field of health sciences and nursing, where patient-centered care is fundamental. Therefore, SCT can be complemented as a theoretical framework by applying Peplau's (1992) concept of the interpersonal relationship between the nurse and the patient.

In mental health nursing, a key aspect of this relationship is dynamic interaction, where mutual trust, knowledge, and attitudes play a significant role. Additionally, the nurse's human-centered expertise and communication skills, as an active participant in patient care, directly contribute to the patient's well-being (Peplau, 1992). Thus, the importance of professional growth is emphasized as an integral part of the holistic nursing process, highlighting its reciprocal role in promoting MHL and care.

Finally, to evaluate the determinants of MHL among PHC workers in South Africa and Zambia, this study was guided by the theoretical constructs of SCT. It emphasised that PHC workers, as active recipients, engage within a triadic relationship consisting of (1) personal determinants such as beliefs and values, (2) behavioural factors linked to self-efficacy, and (3) environmental determinants within the SSA context. In line with SCT, the MHL of PHC workers reflects cultural norms and social models, demonstrating their ability to regulate motivation for mental health promotion and personal growth through feedback and self-evaluation. PHC workers are thus understood within their specific sociocultural contexts in SSA as self-regulating and reflective agents who learn through social interactions and subsequently share their acquired competencies and skills within their communities.

The MHLS, as the chosen instrument, aligns with SCT, and its social cognitive aspects were assessed throughout the study, from development and validation to the interpretation of results. The rationale for the theoretical background of this study is illustrated in Figure 4.

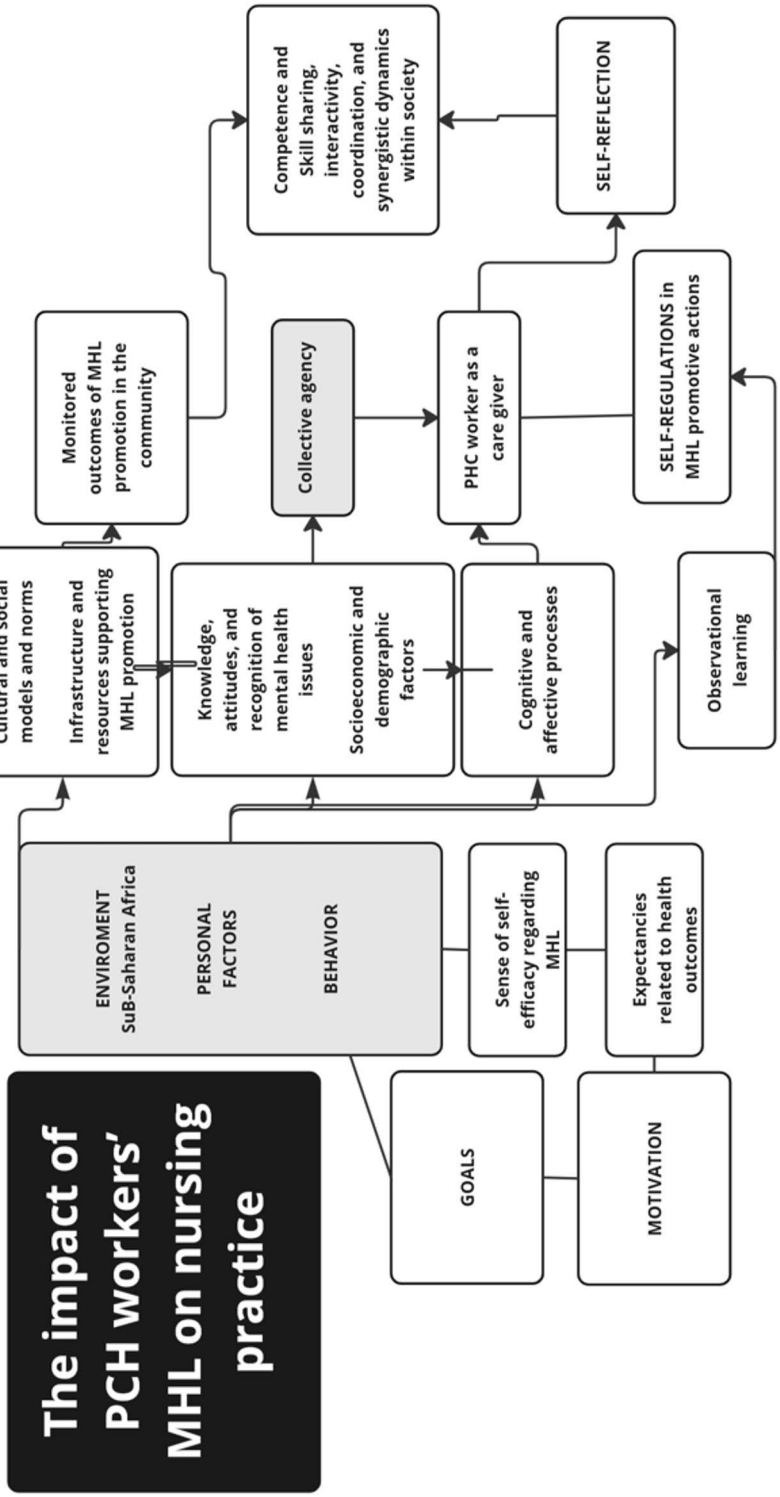



**Figure 4**. Applied study framework based on social cognitive theory. **Note.** Abbreviations: PHC = Primary healthcare; MHL = Mental health literacy

## 5.2 Study design

A mixed method design (Kettles et al., 2011) was used in this study to collect and analyse data based on the study aims and research questions (phases I-III). A mixed method is typically defined as a method of combining and integrating qualitative and quantitative approaches, affecting research procedures such as data collection, data analysis, and interpretation of results (Giddings, 2006; Molina-Azorin, 2016; Yoshikawa et al., 2008). The advantages of this method include a deeper understanding of the phenomenon under investigation, which can enhance the validity of the interpretation of the results (Molina-Azorin, 2016).

This study predominantly used quantitative methods, supplemented by qualitative measures. Specifically, an expert panel was employed to evaluate the content validity of the final research instrument designed to study MHL among PHC workers in South Africa and Zambia. This procedure can be understood as an embedded design within a mixed methods framework (Kettles et al., 2011). All study phases (I-III) were aligned with the design and settings of the MEGA project.

**In Phase I**, A mixed methods study was conducted using a convergent design (Polit & Beck, 2018), and expert panels, integrating qualitative and quantitative approaches to content-validate the Mental Health Literacy Scale (MHLS) by O'Connor & Casey (2015). This process took place in two phases from April to May 2018. A heterogeneous expert panel method (Schilling et al., 2007), comprising research experts and experiential experts as the target group for further study Phases II and III, provided us with a better cultural understanding of the research topic. The inclusion of clinical and experiential experts in expert panels has been strongly recommended in the literature and during content validation processes (Coulter et al., 2016; Intan Suraya Noor Arzahan et al., 2021; Kusi Amponsah et al., 2020; Schilling et al., 2007). Nevertheless, a clinical and experiential perspective continues to be recognised as essential alongside panels that are predominantly guided by a scientific foundation.

**In Phase II**, A cross-sectional study (Polit & Beck, 2018) was conducted to evaluate the psychometric properties (DeVon et al., 2007), including construct validity and internal consistency, of the content-validated and revised MHLS in South Africa and Zambia. The study took place between October 2018 and December 2019.

The MHLS had previously been documented as a psychometrically and conceptually robust instrument (O'Connor & Casey, 2015; Wei et al., 2016), a quality crucial to its validity and continued usability. Construct validity and internal consistency were evaluated to ensure psychometrically reliable results for studying PHC workers' MHL within a new cultural context in SSA. The methodological quality of this study phase was guided by the 2019 version of the Consensus-Based

Standards for the Selection of Health Measurement Instruments (COSMIN) Study Design checklist (Mokkink et al., 2018; Prinsen et al., 2018; Terwee et al., 2018).

**In Phase III**, a cross-sectional descriptive and analytical study design was employed (Polit & Beck, 2018) to assess the MHL of PHC workers in South Africa and Zambia, along with related determinants, using the previously revised MHLS. The STROBE checklist by Elm et al. (2007) for reporting cross-sectional studies was applied to ensure the methodological quality of the study.

## 5.3 Mental Health Literacy Scale Instrument

The MHLS instrument was applied in this study. Originally developed in Australia (O'Connor & Casey, 2015), the instrument is grounded in the original 'gold standard' conceptualisation of MHL (Jorm, 2000; Jorm et al., 1997). It was designed to assess the identification of mental health-related conditions, as well as knowledge, beliefs, and attitudes towards mental health issues. This study represents the first time that MHL has been examined in LMICs using the MHLS instrument, which encompasses all attributes introduced by Jorm (2000).

The MHLS has previously demonstrated strong psychometric properties, with evidence of sound validity and reliability (O'Connor & Casey, 2015), and excellent statistical performance (Wei et al., 2016). In recent years, increased interest in MHL has led to various adaptations, validations, and modifications of the MHLS (ElKhalil et al., 2024).

The original MHL instrument consists of 35 items formed of six attributes, reflecting the main themes of MHL such as recognition, knowledge, and attitudes towards mental health issues (see Figure 5). The total score of the 35 items on the MHLS is calculated by adding all the items' scores together (minimum score 35, maximum score 160). Respondents answered Questions 1–15 on a 4-point scale ranging from 1 (very unlikely/unhelpful) to 4 (very likely/helpful) and Questions 16–35 on a 5-point scale ranging from 1 (strongly disagree/definitely unwilling) to 5 (strongly agree/definitely willing). Reverse-scoring items are Q10, Q12, Q15, and Q20–Q28. O'Connor & Casey (2015) did not suggest any cut-off points for the appropriate level of scoring the MHLS.


**Figure 5**. Theoretical framework of Mental Health Literacy Scale by items (modified from O'Connor et al., 2014)

## 5.4 Setting samples and data collection

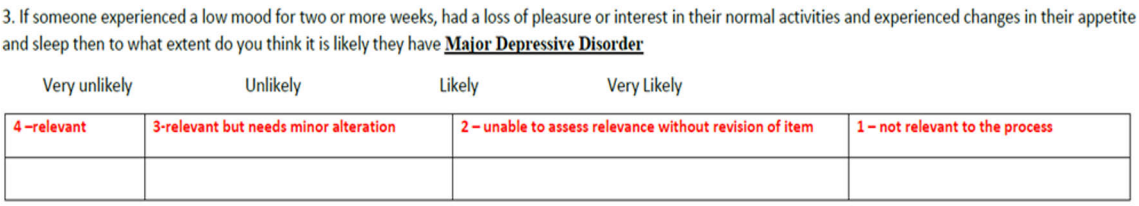
**In Phase I**, the study population consisted of clinical experts (CEs), who were PHC workers, and professional research experts (PREs), who were MEGA project researchers. Two separate expert panels were formed, one for each group. The panel composed of PREs was held at the University of the Free State, South Africa, in April 2018. The subsequent panel, consisting of CEs, took place in a clinical setting at the local clinic in Lusaka, Zambia, in May 2018.

By inviting PREs (n=11) from the MEGA research team, most of whom were mental health researchers with doctoral qualifications and clinical backgrounds, a scientific perspective on the research phenomenon was established. The local members of the MEGA group also had a strong connection to health education. The MEGA research team based at the local university recruited ten CEs (n=10) from a PHC clinic in Lusaka. The CEs contributed a clinical and experiential perspective on the subject under investigation. As an inclusion criterion, in accordance with the MEGA project protocol (Lahti et al., 2020), the participating PHC workers were required to have regular clinical contact with adolescents.

Following the research protocol, the main investigator led the expert panel procedure, and the co-investigator carefully wrote field notes and monitored the

study (Holloway & Galvin, 2016). A brief presentation of the study's purpose was given to both groups during the data collection sessions.

After agreeing to participate in the study (see "Ethical considerations"), the researcher asked participants to fill in background information (country, working region and experience, age, gender, education, and current profession) and to rate each of the 35 items of the MHLS instrument on a 4-point scale from 1 (not relevant) to 4 (very relevant) (Schilling et al., 2007), reflecting each item's relevance to measure the MHL of PHC workers in South Africa and Zambia. Subsequently, all items of the MHLS were discussed with both expert groups to hear their views in more detail in order to evaluate the content validity of the MHLS instrument in the study context. Finally, the collected data consisted of 23 transcribed pages, 8 pages of field notes, and three hours of audio recordings. Figure 6 presents an example of a question regarding the items' relevance in the data collection.


3. If someone experienced a low mood for two or more weeks, had a loss of pleasure or interest in their normal activities and experienced changes in their appetite and sleep then to what extent do you think it is likely they have **Major Depressive Disorder**

Very unlikely Unlikely Likely Very Likely

| 4 –relevant | 3-relevant but needs minor alteration | 2 – unable to assess relevance without revision of item | 1 – not relevant to the process |
|---|---|---|---|
| | | | |

**Figure 6.** Item relevance on a 4-point scale from 1 (not relevant) to 4 (very relevant) (adapted from Schilling et al. (2007).

**In Phase II**, the study population consisted of PHC workers (n = 454, N = 505) from five administrative regions in South Africa (Free State, Gauteng, and Western Cape provinces) and Zambia (Lusaka and Central provinces). To obtain a convenience sample (Edgar & Manz, 2017) PHC workers at the front line of rural, peri-urban, and urban healthcare facilities, who regularly engage with, care for, and screen youths and adolescents for mental health issues in clinical practice, were targeted. The literature generally suggests a minimum sample-to-item ratio of 5:1 for scale development (Ali Memon et al., 2020), which in this study translates to a minimum expected sample size of 175 participants, based on the 35 items of the MHLS.

The inclusion criteria were in line with the MEGA study protocol (Lahti et al., 2020), and participants were required to (a) be registered or enrolled nurses or clinical officers working in PHC in the study regions, and (b) be able to communicate in English, both orally and in writing. PHC workers who were expected to retire during the planned project period (2017 to 2020) were excluded.

Data was collected using the previously content-validated and revised MHLS instrument. Additionally, background information was collected on country, sex, age, professional education, and CPD/training activity to describe the characteristics of the population. The background questions of this study were part of the MEGA project's wider set of questions (n = 42), related to workload, mental health services, and smartphone use, among other things. Final data was collected between October 2018 and December 2019. PHC workers participated in the study alongside their active work during healthcare clinics' business hours.

**In Phase III,** the study population consisted of PHC workers (n = 306, N = 505), based on the research protocol and process of the previous phase (Phase II). In order to study the possible determinants related to MHL among PHC workers, demographic characteristics of the study population were collected, along with additional questions related to determinants of MHL (table 4). Missing or inadequate background variable data from one study site resulted in the same dataset not being consistently usable in the Phase II and Phase III analyses.

**Table 4**. Determinants of mental health literacy investigated in the study (adapted from Korhonen, Axelin, Stein, et al., 2022).

| **Determinant of MHL** | |
|---|---|
| **D1** Country | **D7** *CPD/ training activity or course of child and adolescent* mental health issues |
| **D2** Working province | **D8** Mental health-related assessment *scales or screening* tools used in work |
| **D3** Age_Group | **D9 N**umber of *adolescents with suicidal thoughts* or attempts seen per month |
| **D4** Gender | **D10** Number of *adolescents experienced trauma* (e.g. rape. sexual abuse. car accidents. fire. physical abuse. etc.) seen per month |
| **D5** Education | **D11** *Experienced problems providing mental health services* in the district |
| **D6** *CPD/ training activity* or course of mental health issues | **D12** Work experience |

**Note.** Abbreviations: MHL = Mental health literacy; CPD = Continuous professional development

Data collection for Phases II and III was completed and ready for further analysis starting in January 2021. Finland, as the leading organisation of the MEGA project, provided overall guidance during the process. All researchers from EU and African participating countries met regularly online and in face-to-face meetings.

## 5.5 Data analysis

**In Phase I**, field notes and audio recordings were analysed using thematic analysis (Holloway & Galvin, 2016; Phillippi & Lauderdale, 2018; Vaismoradi et al., 2013) with a focus on identifying key statements (Holloway & Galvin, 2016). Qualitative content analysis was employed to systematically and structurally process the collected textual and audio data, in order to identify patterns, themes, and meanings.

Discussions held during the expert panels, along with participants' narratives, were carefully transcribed. The next step involved organising and formatting the data in preparation for analysis. The data were then coded and segmented into smaller units, allowing for the identification of themes that either supported or challenged the relevance and usability of the instrument.

Subsequent analysis focused on evaluating item relevance and exploring the rationale behind expert judgments. Through thematising the content of the discussions, the aim was to develop a comprehensive understanding and reach consensus on the research questions, thereby enhancing the trustworthiness of the findings (Graneheim & Lundman, 2004; Holloway & Galvin, 2016). The thematic analysis is presented in Figure 7.

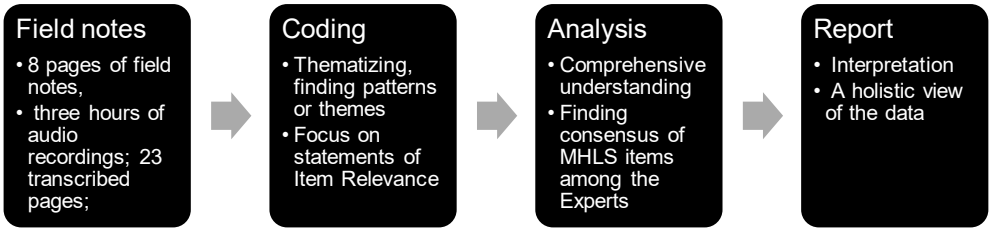



**Figure 7.** The process of thematic analysis in the study (Holloway & Galvin, 2016). **Note.** Abbreviations: MHLS = Mental Health Literacy Scale

Following the qualitative analysis, item-level content validity indexes (I-CVI) (Polit & Beck, 2006, 2018) were calculated for the 35 items of the MHLS instrument. By calculating the I-CVIs separately for the total group of experts (I-CVI-ALL, n = 21), PREs (I-CVI-PRE, n = 11), and CEs (I-CVI-CE, n = 10), informed decisions were made regarding whether to delete, revise, or retain research scale items of the MHLS instrument. (Polit & Beck, 2006).

CVIs were formed using a 4-point relevance scale, where items rated 3 or 4 may have reached the best overall item score (1.00). A defined cutoff point was set at (≥

0.8) (Schilling et al., 2007), reflecting the relevance and appropriateness of the individual scale items. In addition, the average CVIs consisting of all the 35 items of the MHLS were calculated for the entire scale (a scale-level index, S-CVI/Ave, 35 items). A higher cutoff criterion of ≥ 0.9 was set for the S-CVI, based on the authors (Polit & Beck, 2006; Schilling et al., 2007). Examples of the logic behind the item ratings are presented in Figure 8.

| Item | Expert 1 | Expert 2 | Expert 3 | Expert 4 | Expert 5 | Expert 6 | Expert 7 | Expert 8 | Expert 9 | Expert 10 | Number in Agreement | Item CVI (I-CVI-CE) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | — | x | x | — | x | — | — | x | — | x | 5 | 0.5 |
| 2 | — | x | x | — | x | x | — | x | — | x | 6 | 0.6 |
| 3 | — | x | x | x | x | x | — | x | x | — | 7 | 0.7 |

**Figure 8.** Examples of the items rated 3 or 4 (x) on a 4-point relevance scale (modified from Korhonen et al., 2019). **Note.** Abbreviations: I-CVI-CE = Item-level content validity indexes, clinical experts

The findings were generated in the analysis according to the following principles: (a) all suggestions provided by the experts (PREs and CEs) were carefully reviewed, and revisions were applied where appropriate; (b) in cases where the I-CVI-PRE of a targeted item met the preferred cut-off criterion (≥ 0.8) but the I-CVI-ALL fell below this threshold, a careful and critical examination of the ratings and qualitative feedback was conducted. This analysis was based on expert suggestions regarding the relevance and clarity of the MHLS; (c) reporting the I-CVI-Clinical provided the research team with a broader, target group perspective for validation and served as a guiding tool in the decision-making process during the analysis. In instances of dissenting opinions, the final decision to retain, eliminate, or revise an item was made based on the guidance of the PREs; (d) experts who provided unclear markings in the MHLS item ratings were excluded from the calculation. The content validation process is illustrated in Figure 9.

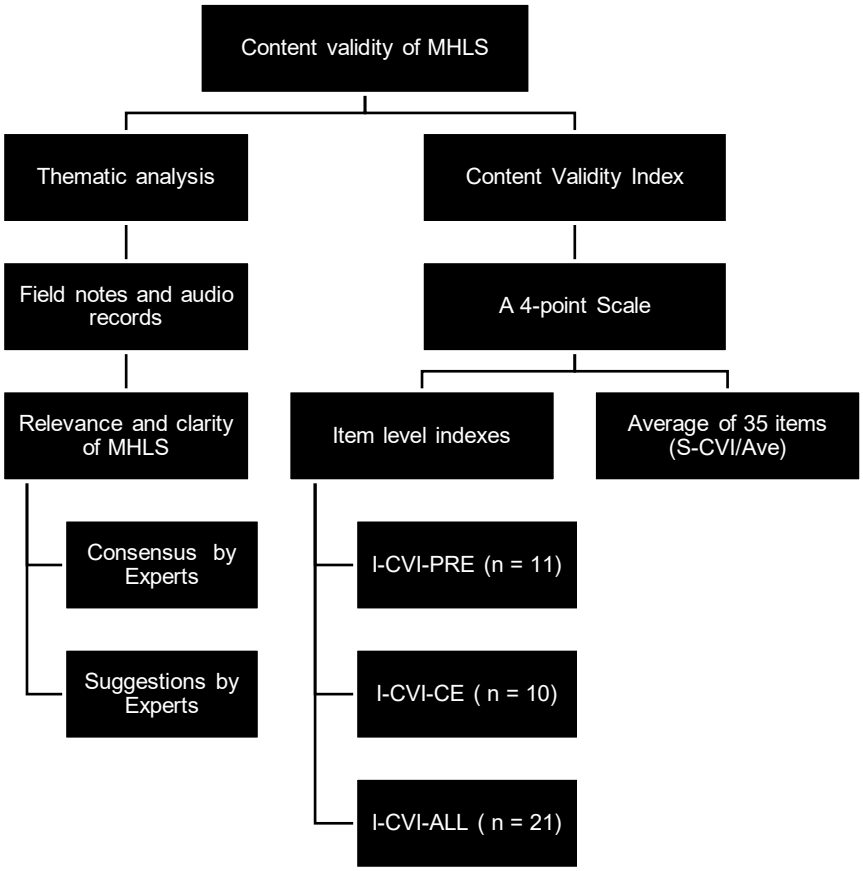



**Figure 9.** Content Validation of the 35 Items of the MHLS Instrument (Korhonen et al., 2019). **Note.** Abbreviations: I-CVI-CE = Item-level content validity index, clinical experts; I-CVI-PRE = Item-level content validity index, professional research experts; I-CVI-ALL = Item-level content validity index, all experts; S-CVI/Ave = Scale-level content validity index (average method)

**In Phase II**, statistical analyses were performed using SPSS version 26 software. Construct validity was examined with Principal Component Analysis (PCA) (Brown, 2015; Grove, 2013; Maćkiewicz & Ratajczak, 1993; Mishra et al., 2017) to indicate the degree and capability of the previously content-validated MHLS instrument in measuring the formulated constructs in relation to its theoretical background and concepts, as an original methodological purpose of construct validity (DeVon et al., 2007; Polit & Beck, 2018). The PCA method allowed the data set to be extracted into smaller content and uncorrelated linear functions with maximum variance to be identified (Jolliffe & Cadima, 2016). The fewer components represented the original variables by reducing the dimensionality, thereby facilitating the interpretation of the data without losing too much information (Mishra et al., 2017). The varimax rotation

method with the eigenvalue criterion was used in the analysis of the formed component structure. As a traditional and one of the most common methods in data extraction (Jolliffe & Cadima, 2016), PCA has been recognised as suitable for exploring the construct validity of a new instrument on attitudes, beliefs, values, and opinions (Grove, 2013). The significance value was set at ($p \leq .05$). Component loadings reaching ≥0.30 were accepted (Waltz et al., 2016b)**.**

Sum variables were constructed according to the theoretical structure of the MHLS by aggregating the coded responses. Internal consistency reliability was assessed using Cronbach's alpha coefficients (C α), with a preferred cut-off point of ≥ 0.70 (DeVon et al., 2007; Gray, 2017; Tavakol & Dennick, 2011; Waltz et al., 2016a). Alpha values were calculated through item analysis to examine the compatibility of each of the 35 MHLS items, as well as for each of the six attributes of knowledge, recognition, and attitudes represented in the MHLS. This approach is strongly recommended in methodological literature to avoid misinterpretation of alpha and is consistent with the assumption that the items measure the same latent construct, as in the tau-equivalent model (Tavakol & Dennick, 2011; Waltz et al., 2016a). Statistical analyses for PCA and Cronbach's alpha included only complete responses. Nevertheless, the Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of sphericity (IBM, 2021) were conducted for testing suitability of PCA method.

**In Phase III**, descriptive statistics such as frequencies, percentages, mean values, and standard deviation (SD) were examined in the analysis of sample characteristics using SPSS version 26 software. To facilitate the comparison of different items of the MHLS scales, coefficients of variation (CV) were used to indicate the level of dispersion around the means. In order to explore MHL among the PHC workers in South Africa and Zambia, sum variables were calculated by following the theoretical structure of the MHLS instrument, which is divided according to knowledge, recognition, and attitudes towards mental health issues (see Figure 5). Additionally, internal consistency for the formed sum variables was examined using Cronbach's α-values through item analysis for each (Item-Total and Item Summary Statistics).

Finally, multifactor analysis of variance (ANOVA) was conducted to explore the demographic and work-related determinants of the population (Table 3) in relation to the three attributes and the whole scale of the MHLS. The sum variables of all 35 items of the revised MHLS were included in the main-effect model in the multifactor ANOVA. Sidak adjustments (pairwise multiple comparisons, $p \leq .05$) were applied, using only the complete cases in the statistical analysis.

## 5.6 Ethical considerations

It is well established that involving LMICs in research presents some of the most critical ethical challenges (European Commission, 2013). In particular, concerns

have been raised regarding population groups in especially vulnerable positions (European Commission, 2009). Therefore, special precautions are necessary when conducting research in emerging economies and non-EU member states, regardless of the requirement for research protocols to align with EU legislation.

One of the core principles in international research projects such as the MEGA project is that all stakeholders and communities should benefit. This includes ensuring that local populations gain from the study outcomes, as well as assessing any potential environmental impact arising from research activities (European Commission, 2013).

This doctoral study adhered to the rigorous scientific practices recommended by international guidelines (International Council of Nurses, 2021; Polit & Beck, 2018; Resnik & Shamoo, 2011; World Medical Association, 2013). Key ethical principles (Resnik & Shamoo, 2011), such as honesty in all research phases, accountability during research activities, and courtesy and fairness, were variously emphasised throughout the research project to explore the MHL of PHC workers in South Africa and Zambia.

The MEGA project partner universities, representing different administrative regions, individually obtained the necessary ethical approvals from their respective university ethics committees and the National Health Research Authorities in South Africa and Zambia. All research permits were received between June 2018 and April 2019. Within the framework of a data sharing agreement with the partner universities, all researchers committed to the continuous monitoring of data and the safety of all study participants.

During data collection, the researchers responsible for recruiting participants provided both oral and written information about the specific study phase under investigation. Written informed consent was obtained during each phase of the doctoral study (Phases I–III). Participation was entirely voluntary, and participants had the right to decline or withdraw from the study at any time without providing a reason. No vulnerable individuals were involved in the study.

Data were personally delivered to the principal investigator during partner meetings. All data were stored in accordance with the Turku University of Applied Sciences (TUAS) archiving protocol to ensure secure handling. However, due to COVID-19 travel restrictions, not all hard copies of the quantitative data from Phases II and III could be physically transferred to TUAS. These data were instead stored at the local universities, in compliance with the data sharing agreement. Prior to online transfer, the quantitative data were coded by local HEI researchers, and no traceable personal information was included.

International scientific cooperation may face challenges related to cultural differences or specific regulations that reflect varying community norms. In this research, the challenges were associated with differing study protocols across the

various administrative regions and states involved in the project. Potential obstacles were discussed during partner meetings, conducted both face-to-face and online, throughout the project's duration to uphold good scientific practice (World Medical Association, 2013). Nevertheless, the research team consisted of MEGA project partners, which included ethical and societal experts from SSA. These experts were integrated into all research activities, allowing us to learn from local practices (European Commission, 2009, 2013).

## 5.7 Summary of methodology

This study employed a mixed-methods design across three phases to validate the MHLS and investigate the MHL of PHC workers, along with associated factors in the SSA region. A summary of the methodology is presented in Figure 10.

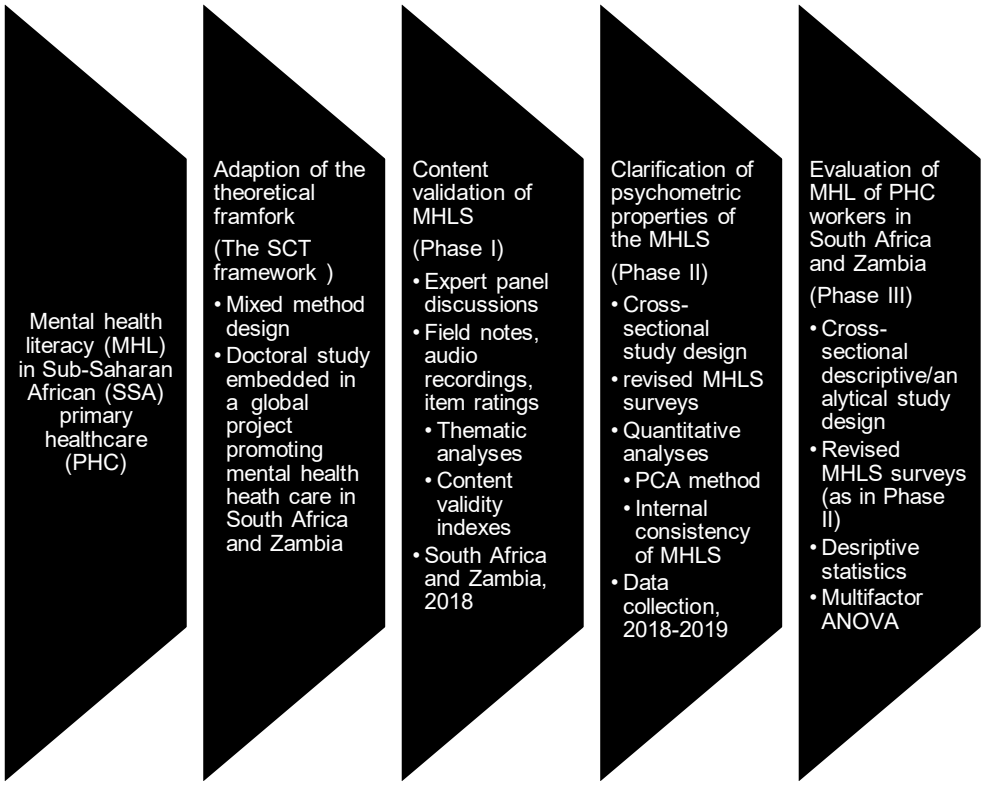



**Figure 10.** Materials and methods of the doctoral study. **Note.** Abbreviations: PHC; Primary healthcare; MHL = Mental health literacy; SSA = Sub-Saharan Africa; MHLS = Mental Health Literacy Scale; SCT = social cognitive theory; ANOVA = analysis of variance

# 6 Results

This chapter presents a summary of the study findings on the assessment of MHL among PHC workers in SSA and its determinants. The results are organised according to the sub-phases of the study (Phases I–III) to demonstrate the psychometric properties and validity of the MHLS, as well as the MHL levels of PHC workers and the potential influencing factors.

## 6.1 Characteristics of participants

**In Phase I,** to validate the content of the MHLS instrument, eleven PREs and ten CEs from the study's target population were invited to take part. In total, 21 experts from four different countries participated, including both men and women. Their educational backgrounds ranged from certificate level to PhD, and they reported experience in both clinical and research roles. In the PRE group there were also members with a lecturer background, whereas in the CE group the profession was mainly registered nurse or midwife. None of the CEs reported professional health research experience. Most PREs had worked for 15 years or more, while half of the CEs had fewer than five years of professional experience.

For Phases II and III, MEGA project researchers recruited a total of 505 primary healthcare (PHC) practitioners.

**In Phase II,** 454 responses were included in the final analysis to assess the construct validity and internal consistency of the revised MHLS tool. After data cleaning, 343 complete responses were retained. The majority of participants were female and from Zambia. Most reported a diploma as their highest qualification. Most were aged 40 years or younger, with the largest group aged 30 or under. In addition, the vast majority had not taken part in any CPD activity or training related to mental health.

**In Phase III,** to explore potential determinants, a convenience sample of PHC practitttioners, of which n = 306 consenting participants were included in the final analysis. The difference in sample size compared to the Phase II dataset was due to missing or inadequate background variable data in one of the research locations. Complete data were obtained from 250 participants, allowing for the calculation of

overall revised MHLS scores. Additionally, variance analysis was conducted for a subsample of n = 200 to explore determinants of MHL.

The recruited PHC employees were mostly female and South African. A diploma was most often reported as the highest qualification. About a quarter had taken part in CPD or training on mental health. As in Phase II, the sample mainly consisted of young adults, with those aged 30 years or younger forming the largest age group. Around half had less than ten years of work experience.

In their districts, most PHC workers reported challenges in providing adequate mental health services. Just over half had used a mental health evaluation scale or screening tool in their clinical work. Detailed participant characteristics are shown in Table 5.

**Table 5.** Characteristics of participants in the study.

| Study phase | Participant recruitment | Educational and professional background | Work experience |
|---|---|---|---|
| **Phase I:** Content Validation of the MHLS (Korhonen et al., 2019) | • PREs (n = 11), CEs (n = 11),<br>• 21 experts from four different countries (South Africa, Zambia, Germany and Finland)<br>• both men and women represented | • Education ranging from certificates to PhDs<br>• CEs with no health research profession | • PREs: Majority, n = 8, with 15 years or more of experience<br>• CEs: half with less than five years of work experience |
| **Phase II:** Construct validity and internal consistency of the MHLS (Korhonen, Axelin, Katajisto, et al., 2022) | • 454 responses in the analysis<br>• 343 complete responses:<br>○ 74%, n = 251 female<br>○ 53% , n = 181 Zambian<br>○ Majority aged 40 years or younger<br>○ largest group aged 30 years or below | • 66%, n = 219 diploma level<br>• 84%, n = 287 had not participated in CPD or mental health training | (Not reported in Phase II) |
| **Phase III:** Evaluation of MHL of PHC workers in South Africa and Zambia (Korhonen, Axelin, Stein, et al., 2022) | • 306 PHC practitioners in the analysis,<br>○ 250 provided complete data.<br>○ 200 responses used for variance analysis to explore MHL determinants.<br>• 77%, n = 191 female<br>• 65%, n = 162 South African<br>• 33%, n = 82 aged 30 years or younger | • 59%, n = 143 diploma level<br>• 73%, n = 182 had not participated in CPD or mental health training<br>• 51%, n = 128 had used mental health screening tools in clinical work | • 49%, n = 119 had less than 10 years of work experience<br>• 70%, n = 170 reported challenges in delivering mental health services |

**Note.** Abbreviations: PHC; Primary healthcare; MHL = Mental health literacy; SSA = Sub-Saharan Africa; MHLS = Mental Health Literacy Scale

## 6.2 Psychometric properties of the Mental Health Literacy Scale

The results of the study demonstrated that the revised MHLS instrument is both content-wise and structurally appropriate for measuring the knowledge, recognition, and attitudes of PHC workers in LMIC environments towards mental health problems. Of the original 35 items in the scale, a total of 19 were reviewed, of which eleven were slightly modified to better reflect cultural understanding. Divergent perspectives emerged between the research and clinical experts, reflecting elements related to mental health stigma. Psychometric testing indicated that the scale demonstrated a linear and robust structure.

### 6.2.1 Content validity of the Mental Health Literacy Scale in the Sub-Saharan context

After conducting expert panels to validate the content of the original MHLS developed by O'Connor & Casey (2015), the item-level content validity index (I-CVI) was calculated (I-CVI) for each of the 35 MHLS items, based on ratings from eleven (n = 11) PREs and ten (n = 10) CEs. The I-CVIs for the PREs ranged from 0.82 to 1.00, with all 35 items (n = 35) meeting the I-CVI cutoff criterion of 0.8. In the CE study group, the ratings showed greater variation, ranging from 0.10 to 1.00, with ten items (n = 10) out of the 35 (n = 35) meeting the I-CVI cutoff criterion (≥0.8).

At the scale level (S-CVI), the average CVI of all items was 0.95 for PREs and 0.62 for CEs, with a higher cutoff criterion set at ≥0.9. The mean validity index for both PREs and CEs (0.8, S-CVI/Ave) was also examined. The item ratings are presented in Table 6.

**Table 6**. Content validity index (CVI) ratings for 35 Mental Health Literacy Scale items by experts (adapted from Korhonen, Axelin, Katajisto, et al., 2022).

| | Number of experts in agreement | | Item CVI | |
|---|---|---|---|---|
| **Item** | **Professional research expert** | **Clinical expert** | **I-CVI-PRE** | **I-CVI-CE** |
| **1** | 9 | 5 | 0.90 | 0.5 |
| **2** | 10 | 6 | 1.00 | 0.6 |
| **3** | 11 | 7 | 1.00 | 0.7 |
| **4** | 9 | 6 | 0.82 | 0.6 |
| **5** | 9 | 6 | 0.82 | 0.67 |
| **6** | 10 | 8 | 0.91 | 0.8 |
| **7** | 11 | 7 | 1.00 | 0.7 |
| **8** | 11 | 8 | 1.00 | 0.8 |
| **9** | 9 | 1 | 0.82 | 0.1 |
| **10** | 9 | 2 | 0.82 | 0.2 |
| **11** | 10 | 8 | 1.00 | 0.8 |
| **12** | 10 | 5 | 0.91 | 0.5 |
| **13** | 11 | 9 | 1.00 | 0.9 |
| **14** | 11 | 9 | 1.00 | 0.9 |
| **15** | 10 | 6 | 0.91 | 0.6 |
| **16** | 11 | 10 | 1.00 | 1.00 |
| **17** | 11 | 9 | 1.00 | 0.9 |
| **18** | 11 | 9 | 1.00 | 0.9 |
| **19** | 11 | 10 | 1.00 | 1.00 |
| **20** | 10 | 5 | 0.91 | 0.5 |
| **21** | 11 | 4 | 1.00 | 0.4 |
| **22** | 11 | 6 | 1.00 | 0.6 |
| **23** | 11 | 6 | 1.00 | 0.75 |
| **24** | 10 | 3 | 0.91 | 0.3 |
| **25** | 10 | 4 | 0.91 | 0.4 |
| **26** | 11 | 5 | 1.00 | 0.5 |
| **27** | 11 | 4 | 1.00 | 0.4 |
| **28** | 10 | 3 | 0.91 | 0.3 |
| **29** | 10 | 7 | 0.91 | 0.7 |
| **30** | 10 | 5 | 0.91 | 0.5 |
| **31** | 11 | 8 | 1.00 | 0.8 |
| **32** | 11 | 6 | 1.00 | 0.6 |
| **33** | 10 | 5 | 0.91 | 0.5 |
| **34** | 11 | 7 | 1.00 | 0.7 |
| **35** | 11 | 7 | 1.00 | 0.7 |
| **Mean Item level CVI (S-CVI/Ave)** | | | 0.95 | 0.62 |

**Note.** Abbreviations: I-CVI-CE = Item-level content validity index, clinical experts; I-CVI-PRE = Item-level content validity index, professional research experts; S-CVI/Ave = Scale-level content validity index (average method)

#### 6.2.1.1 Relevance and clarity of the Mental Health Literacy Scale

The clarity and relevance of the different questions in the MHLS instrument were examined during expert panel discussions. Generally, the experts concurred that the MHLS is appropriate for measuring PHC workers' MHL.

In more detail, a clear majority of the 35 questions on the scale were agreed to be relevant from the discussions without further revisions. PREs suggested in four cases, and CEs in six cases, that the questions were relevant but required minor alterations. In a total of five cases, the question was considered unclear by one of the panel teams. Nevertheless, based on the CVI ratings and detailed discussions within the expert panel, a total of n = 16 items were retained in their original form without revision for further analysis.

A total of 19 items from the MHLS instrument were reviewed in this study. Of these, 11 items were modified based on expert feedback. In three cases (items 6, 7, and 14), the items had already met the required CVI threshold (≥0.8), but were still revised to improve conceptual clarity, as recommended by the experts.

Eight items (items 4, 12, 21, 26, 27, 28, 30, and 33) were retained in their original form after further analysis. For five of these (items 4, 12, 27, 28, and 33), the expert suggestions were incomplete, and for the remaining three (items 21, 26, and 30), the comments reflected the experts' broader views on mental health rather than specific concerns about item relevance. The ratings, relevance statements, and rationales for the reviewed items are presented in Table 7.

**Table 7.** Rationale and revision of the Mental Health Literacy Scale items (n = 19) (modified from Korhonen et al., 2019)

| Original Item | Item level CVI PREs / CEs / All experts | Relevance PRE / CEs | Rationale for the review | Final form of the item |
|---|---|---|---|---|
| 1. If someone became extremely nervous or anxious in one or more situations with other people (e.g., a party) or performance situations (e.g., presenting at a meeting) in which they were afraid of being evaluated by others and that they would act in a way that was humiliating or feel embarrassed, then to what extent do you think it is likely they have Social Phobia | 0.90/ 0.50/ 0.70 | Relevant/ Not clear | Item modified on the basis of the suggestions<br><br>Among the Cs, attitudes or misunderstandings were evident, particularly in the perceived conflict between feeling anxious and nervous in the context of a party. | If someone became extremely nervous or anxious in one or more situations with other people (e.g., **in social gatherings)** or performance situations (e.g., presenting at a meeting) in which they were afraid of being evaluated by others and that they would act in a way that was humiliating or feel embarrassed, then to what extent do you think it is likely they have Social Phobia |
| 4 To what extent do you think it is likely that Personality Disorders are a category of mental illness | 0.82/ 0.60/ 0.71 | Relevant/ Relevant | – | Retained the original expression |
| 5 To what extent do you think it is likely that Persistent Depressive Disorder (Dysthymia) is a disorder | 0.82/ 0.67/ 0.75 | Relevant, but needs minor alteration/ Relevant | To clarify, the term “mental” was added | To what extent do you think it is likely that Persistent Depressive Disorder (Dysthymia) is a **mental** disorder |
| 6 . To what extent do you think it is likely that the diagnosis of Agoraphobia includes anxiety about situations where escape may be difficult or embarrassing | 0.91/ 0.80/ 0.86 | Relevant/ Relevant | To clarify, the phrase "e.g. (open market place)" was added as suggested by experts | To what extent do you think it is likely that the diagnosis of Agoraphobia includes anxiety about situations **(e.g., open market place)** where escape may be difficult or embarrassing |
| 7 .To what extent do you think it is likely that the diagnosis of Bipolar Disorder includes experiencing periods of elevated (i.e., high) and periods of depressed (i.e., low) mood | 1.00/ 0.70/ 0.86 | Relevant/ Relevant | To clarify, the term "extremely elevated" was added accordingly | To what extent do you think it is likely that the diagnosis of Bipolar Disorder includes experiencing periods of **extremely elevated** (i.e., high) and periods of depressed (i.e., low) mood |

| Original Item | Item level CVI<br>PREs / CEs /<br>All experts | Relevance<br><br>PRE / CEs | Rationale for the review | Final form of the item |
|---|---|---|---|---|
| 9 .To what extent do you think it is likely that in general in Australia, women are MORE likely to experience a mental illness of any kind compared to men | 0.82/<br>0.10/<br>0.50 | Relevant with minor alternation /<br><br>Relevant with minor alternation | The context shifted to a global viewpoint | To what extent do you think it is likely that in general **women are MORE likely to experience some mental illnesses compared to men** |
| 10 . To what extent do you think it is likely that in general, in Australia, men are MORE likely to experience an anxiety disorder compared to women | 0.82/<br>0.20/<br>0.52 | Relevant/<br>Relevant with minor alternation | The context shifted to a global viewpoint, and experts stated that no statistics were available in Zambia | To what extent do you think it is likely that in general, **men are MORE likely to experience an anxiety disorder compared to women** |
| 12 . To what extent do you think it would be helpful for someone to avoid all activities or situations that made them feel anxious if they were having difficulties managing their emotions | 0.91/<br>0.50/<br>0.71 | Not clear/<br>Relevant | The item was not considered clear, but the PREs did not provide any explicit recommendations for revision. The CE stated that the item was relevant. | Retained the original expression |
| 14 . Mental health professionals are bound by confidentiality; however there are certain conditions under which this does not apply. To what extent do you think it is likely that the following is a condition that would allow a mental health professional to break confidentiality: *If you are at immediate risk of harm to yourself or others* | 1.00/<br>0.90/<br>0.95 | Relevant/<br><br>Relevant, but needs minor alteration | The question was clarified to reflect the patient's perspective | Mental health professionals are bound by confidentiality; however there are certain conditions under which this does not apply. To what extent do you think it is likely that the following is a condition that would allow a mental health professional to break confidentiality: *If **a patient is** at immediate risk of harm to oneself or others* |

| Original Item | Item level CVI PREs / CEs / All experts | Relevance PRE / CEs | Rationale for the review | Final form of the item |
|---|---|---|---|---|
| 15 .Mental health professionals are bound by confidentiality; however there are certain conditions under which this does not apply. To what extent do you think it is likely that the following is a condition that would allow a mental health professional to break confidentiality: *if your problem is not life-threatening and they want to assist others to better support you* | 0.91/ 0.60/ 0.76 | Relevant/ Relevant | The question was revised to better reflect the patient's perspective, which the CE had nonetheless deemed relevant. | Mental health professionals are bound by confidentiality; however there are certain conditions under which this does not apply. To what extent do you think it is likely that the following is a condition that would allow a mental health professional to break confidentiality: *If **patient's** problem is not life-threatening and professionals want to assist others to better support a patient* |
| 20. People with a mental illness could snap out if it if they wanted | 0.91/ 0.50/ 0.71 | Relevant, with minor alteration/ Relevant, but needs minor alteration | The term 'snap out' was considered unclear by the PREs, while the CE regarded it as a clear concept. The item was revised in accordance with the suggestions | People with a mental illness could **put themselves together** if they wanted |
| 21. A mental illness is a sign of personal weakness | 1.00/ 0.40/ 0.71 | Relevant/ Relevant, but needs minor alteration | CE reflected a misunderstanding or an attitude of commenting that some illnesses are a character flaw. | Retained the original expression |
| 24. It is best to avoid people with a mental illness so that you don't develop this problem | 0.91/ 0.30/ 0.62 | Not clear/ Relevant | Discussions (PREs) frequently focused on the lack of clarity in the question. The question was modified based on the suggestions, and the CE showed relevance in terms of stigma. | It is best to avoid people with a mental illness so that you don't **catch their illness** |
| 25. If I had a mental illness I would not tell anyone | 0.91/ 0.40/ 0.67 | Relevant, with minor alternation/ Relevant | Expression clarified on the basis of the suggestions. | If I had a mental illness **I would tell no one** |

| Original Item | Item level CVI PREs / CEs / All experts | Relevance PRE / CEs | Rationale for the review | Final form of the item |
|---|---|---|---|---|
| 26. Seeing a mental health professional means you are not strong enough to manage your own difficulties | 1.00/ 0.50/ 0.76 | Relevant/ Not clear | Question raised personal attitudes in the debate among CEs, but was seen as relevant by the most of the experts. | Retained the original expression |
| 27. If I had a mental illness, I would not seek help from a mental health professional | 1.00/ 0.40/ 0.71 | Relevant/ Relevant | – | Retained the original expression |
| 28. I believe treatment for a mental illness, provided by a mental health professional, would not be effective | 0.91/ 0.30/ 0.62 | Relevant/ Relevant | – | Retained the original expression |
| 30. How willing would you be to spend an evening socialising with someone with a mental illness? | 0.91/ 0.50/ 0.71 | Relevant/ Not clear | Question raised personal attitudes in the debate among CEs. | Retained the original expression |
| 33. How willing would you be to have someone with a mental illness marry into your family? | 0.91/ 0.50/ 0.71 | Relevant/ Relevant | – | Retained the original expression |
| **Mean I-CVI (S-CVI/Ave)** | 0.95/ 0.62/ 0.80 | | | |

**Note.** Abbreviations: PRE = Professional Research Expert; CE = Clinical Expert; S-CVI/Ave = Scale-level content validity index (average method)

### 6.2.2 Construct validity and internal consistency of the revised Mental Health Literacy Scale in the South African and Zambian context

To explore the construct validity and internal consistency of the measure, PCA was used to examine the maximum variance of variables by extracting smaller groups of components. The suitability of PCA for construct validity testing was verified using the KMO measure of sampling adequacy, with Bartlett's test of sphericity yielding $\chi^2 = 3861.245$, $df = 595$, $p < 0.001$, resulting in a value of 0.807.

In total, all 35 variables of the MHLS instrument loaded onto nine distinct Principal Components (PCs), which were ordered according to the highest variable loadings. These nine main components collectively accounted for approximately 59% of the total variance. All instrument variables were included in the rotated component matrix (Rotated PCA), with item loadings ranging from 0.446 to 0.832 and item communalities from 0.416 to 0.768.

A total of n = 11 variables from the revised MHLS were identified as loading onto two different PCs, based on a threshold value of ≥0.30. In one case, a variable was found to load across three components.

The findings suggest that the PCs aligned with the theoretical structure of the MHLS, allowing us to label the components as follows: "Recognition" of mental health issues, "Knowledge" related to mental illness and treatments, and "Attitudes" concerning stigma and the promotion of recognition or self-help. Variables reflecting the attribute of recognition were grouped under two components (PC2 and PC7). Attitudinal variables were distributed across four components (PC1, PC3, PC5, and PC9), while knowledge-related items formed three components (PC4, PC6, and PC8). As an exception, the seventh component (PC7) included a knowledge-related question (Q11) but was named 'Recognition' based on its strongest item in terms of communality. Additionally, it was highlighted in the analysis that three components (PC3, PC5, and PC6) were primarily composed of reverse-scored items. The composition of the PCs, based on the theoretical framework of the MHLS, is presented in Table 8.

Internal consistency reliability was examined using Cronbach's alpha coefficient to ensure that the items in the MHLS questionnaire consistently measured the same underlying construct. The result for the whole MHLS measure was $\alpha = 0.804$ (completed responses n = 343, N = 454), which supported the internal consistency of the measure along with the examined construct validity by the PCA method. When the characteristics were considered separately, sufficient Cronbach's alpha values were found in three sections: the ability to recognise disorders, attitudes, and knowledge of how to seek information. However, in three knowledge sections of the measure, the alphas fell below the desired criteria ($\alpha < 0.70$). The two components of the PCA (PC6 & PC8) were named after these three knowledge-related attributes, which consisted mainly of questions on the reverse scoring of the measure (Q9 - Q15).

**Table 8.** Component formation in the revised Mental Health Literacy Scale (modified from Korhonen, Axelin, Katajisto, et al., 2022).

| Theoretical basis of Principal Component (PC) | Original Item of MHLS | ROTATED COMPONENT MATRIX with cumulative % | | Communalities |
|---|---|---|---|---|
| ***PC 1*** ***"ATTITUDES"*** ***"Attitudes that promote recognition or appropriate help seeking behaviour (stigma)" Q20 – Q35*** | 31. How willing would you be to make friends with someone with a mental illness? | .832 | 11.106 | .768 |
| | 30. How willing would you be to spend an evening socialising with someone with a mental illness? | .826 | | .713 |
| | 32. How willing would you be to have someone with a mental illness start working closely with you on a job? | .817 | | .714 |
| | 29. How willing would you be to move next door to someone with a mental illness? | .694 | | .599 |
| | 33. How willing would you be to have someone with a mental illness marry into your family? | .694 | | .685 |
| | 35. How willing would you be to employ someone if you knew they had a mental illness? | .629 | | .695 |
| ***PC 2*** ***"RECOGNITION"*** ***"Ability to recognise disorders"*** **Q1 – Q8** | 5. To what extent do you think it is likely that Persistent Depressive Disorder (Dysthymia) is a mental disorder | .751 | 21.411 | .608 |
| | 7 .To what extent do you think it is likely that the diagnosis of Bipolar Disorder includes experiencing periods of extremely elevated (i.e., high) and periods of depressed (i.e., low) mood | .728 | | .611 |
| | 3. If someone experienced a low mood for two or more weeks, had a loss of pleasure or interest in their normal activities and experienced changes in their appetite and sleep then to what extent do you think it is likely they have Major Depressive Disorder | .695 | | .543 |
| | 4. To what extent do you think it is likely that Personality Disorders are a category of mental illness | .687 | | .551 |
| | 8 .To what extent do you think it is likely that the diagnosis of Substance Abuse Disorder can include physical and psychological tolerance of the drug (i.e., require more of the drug to get the same effect) | .627 | | .437 |
| | 6 . To what extent do you think it is likely that the diagnosis of Agoraphobia includes anxiety about situations (e.g., open market place) where escape may be difficult or embarrassing | .591 | | .452 |
| | 1. If someone became extremely nervous or anxious in one or more situations with other people (e.g., in social gatherings) or performance situations (e.g., presenting at a meeting) in which they were afraid of being evaluated by others and that they would act in a way that was humiliating or feel embarrassed, then to what extent do you think it is likely they have Social Phobia | .446 | | .476 |

| Theoretical basis of Principal Component (PC) | Original Item of MHLS | ROTATED COMPONENT MATRIX with cumulative % | | Communalities |
|---|---|---|---|---|
| ***PC 3*** | 27. If I had a mental illness, I would not seek help from a mental health professional __*REVERSE SCORED* | .770 | 29.934 | .646 |
| ***"ATTITUDES"*** | 28. I believe treatment for a mental illness, provided by a mental health professional, would not be effective__*REVERSE SCORED* | .759 | | .669 |
| ***"Attitudes that promote recognition or appropriate help seeking behaviour (stigma)" Q20 – Q35*** | 26. Seeing a mental health professional means you are not strong enough to manage your own difficulties__*REVERSE SCORED* | .713 | | .563 |
| | 25. If I had a mental illness, I would tell no one. __*REVERSE SCORED* | .680 | | .554 |
| | 24. It is best to avoid people with a mental illness so that you don't catch their illness __*REVERSE SCORED* | .606 | | .542 |
| ***PC 4*** | 19. I am confident I have access to resources (e.g., GP, internet, friends) that I can use to seek information about mental illness | .760 | 37.003 | .656 |
| ***"KNOWLEDGE"*** | 17. I am confident using the computer or telephone to seek information about mental illness | .747 | | .622 |
| ***"Knowledge of how to seek information" Q16-Q19*** | 16. I am confident that I know where to seek information about mental illness | .741 | | .622 |
| | 18. I am confident attending face to face appointments to seek information about mental illness (e.g., seeing the GP) | .718 | | .587 |
| ***PC 5*** | 21. A mental illness is a sign of personal weakness __*REVERSE SCORED* | .651 | 42.134 | .637 |
| ***"ATTITUDES"*** | 23. People with a mental illness are dangerous __*REVERSE SCORED* | .648 | | .479 |
| ***"Attitudes that promote recognition or appropriate help seeking behaviour (stigma)" Q20 – Q35*** | 22. A mental illness is not a real medical illness __*REVERSE SCORED* | .538 | | .612 |
| ***PC 6*** | 9. To what extent do you think it is likely that in general, women are MORE likely to experience some mental illnesses compared to men | -.598 | 46.694 | .504 |
| ***"KNOWLEDGE"*** | 15. Mental health professionals are bound by confidentiality; however there are certain conditions under which this does not apply. To what extent do you think it is likely that the following is a condition that would allow a mental health professional to break confidentiality: *If patient's problem is not life-threatening and professionals want to assist others to better support a patient*__*REVERSE SCORED* | .576 | | .571 |
| ***"Knowledge of risk factors and causes of mental illness" Q9, Q10*** | 12. To what extent do you think it would be helpful for someone to avoid all activities or situations that made them feel anxious if they were having difficulties managing their emotions__*REVERSE SCORED* | .565 | | .431 |
| ***"Knowledge of self-treatment" Q11, Q12*** | 10. To what extent do you think it is likely that in general, men are MORE likely to experience an anxiety disorder compared to women __*REVERSE SCORED* | .463 | | .416 |
| ***"Knowledge of professional help available" Q13 – Q15*** | | | | |

| Theoretical basis of Principal Component (PC) | Original Item of MHLS | ROTATED COMPONENT MATRIX with cumulative % | | Communalities |
|---|---|---|---|---|
| **PC 7**<br>***"RECOGNITION"***<br>***"Ability to recognise disorders" Q1 - Q8***<br>***"Knowledge of self-treatment" Q11, Q12*** | 2. If someone experienced excessive worry about a number of events or activities where this level of concern was not warranted, had difficulty controlling this worry and had physical symptoms such as having tense muscles and feeling fatigued then to what extent do you think it is likely they have Generalised Anxiety Disorder | .651 | 50.946 | .596 |
| | 11. To what extent do you think it would be helpful for someone to improve their quality of sleep if they were having difficulties managing their emotions (e.g., becoming very anxious or depressed) | .643 | | .531 |
| ***PC 8***<br>***"KNOWLEDGE"***<br>***"Knowledge of professional help available"* Q13 – Q15** | 14. Mental health professionals are bound by confidentiality; however there are certain conditions under which this does not apply. To what extent do you think it is likely that the following is a condition that would allow a mental health professional to break confidentiality: *If a patient is at immediate risk of harm to oneself or others* | .776 | 54.961 | .695 |
| | 13. To what extent do you think it is likely that Cognitive Behaviour Therapy (CBT) is a therapy based on challenging negative thoughts and increasing helpful behaviours | .582 | | .559 |
| ***PC 9***<br>***"ATTITUDES"***<br>***"Attitudes that promote recognition or appropriate help seeking behaviour (stigma)" Q20 – Q35*** | 20. People with a mental illness could put themselves together if they wanted __*REVERSE SCORED* | -.575 | 58.829 | .538 |
| | 34. How willing would you be to vote for a politician if you knew they had suffered a mental illness? | .558 | | .710 |
| | **Total variance explained (Rotate PCA, Cumulative %)** | | 59 % | |

**Note.** Abbreviations: MHLS = Mental Health Literacy Scale; PCA = Principal component analysis

## 6.3 Mental health literacy among primary healthcare workers

PHC workers showed individual variation across the different attributes of MHL, with item-level differences evident as relative variation. Among the factors influencing mental health outcomes, a higher level of education was statistically significant and positively correlated with the recognition of mental health-related disorders. Prior use of mental health screening tools and scales also had a significant effect, influencing both overall MHL scores and attitudes.

### 6.3.1 Results for Mental Health Literacy Scale instrument

To assess the MHL of PHC workers in South Africa and Zambia, the internal consistency of the revised MHLS was examined using Cronbach's alpha, based on a total of n = 306 recruited participants. Three of the six attributes on the scale reached favoured alpha values (.70). The MHLS instrument demonstrated high and solid internal consistency ($\alpha = .80$) as a whole, including all of 35 items in the results. Moreover, three knowledge-related attributes failed to meet the internal consistency cutoff standard.

Based on complete responses (n = 250), item distributions and MHLS scores, along with their variability, were calculated. The maximum total score on the revised MHLS instrument was recorded as 150, out of a possible 160. Overall, the score varied among PHC workers, ranging from 76 to 150 (mean = 122.3, SD = 12.4), with the total score having the least relative dispersion around the mean (CV = 10%). When the different attributes of the MHLS were examined in relation to the dispersion around the mean, the factors measuring knowledge stood out from the data by having the greatest coefficients (CV = 23%) for knowledge of how to seek information (Q16-Q19), knowledge of risk factors and causes of mental illness (Q9, Q10), and knowledge of self-medication (Q11-Q12). The variation was considerable when individual questions were compared across 4-point and 5-point scales. The distribution of MHLS findings by attribute is displayed in Table 9.

**Table 9.** Distribution of revised Mental Health Literacy Scale scores among primary healthcare workers (4- and 5-point scales) (modified from Korhonen, Axelin, Stein, et al., 2022).

| Scale | Minimum | Maximum | Mean | SD | CV |
|---|---|---|---|---|---|
| **Revised MHLS_total score (Q1-Q35), min. 35 – max 160** | 76 | 150 | 122.32 | 12.42 | 10 % |
| ***On a 4 – point scale*** | - | - | 2.13 to 3.57 | 0.70 to 1.09 | 20 to 44 % |
| *The ability to recognise disorders (Q1–Q8)* | 8 | 32 | 27.03 | 4.03 | 15 % |
| *Knowledge of risk factors and causes of mental illness (Q9, Q10)** | 2 | 8 | 5.32 | 1.23 | 23 % |
| *Knowledge of self-treatment (Q11–Q12)** | 2 | 8 | 5.20 | 1.18 | 23 % |
| *Knowledge of professional help available (Q13–Q15)** * (α <.70) | 3 | 12 | 9.20 | 1.64 | 18 % |
| ***On a 5 – point scale*** | - | - | 2.58 to 4.52 | 0.90 to 1.30 | 19 to 51 % |
| *Knowledge of how to seek information (Q16–Q19)* | 4 | 20 | 14.99 | 3.45 | 23 % |
| *Attitudes that promote recognition or appropriate help-seeking behaviour (stigma) (Q20–Q35)* | 37 | 79 | 60.58 | 8.19 | 14 % |
| **Valid N** | | | | | ***n* = 250** |

**Note.** Abbreviations: MHLS = Mental Health Literacy Scale; SD = standard deviation; CV = coefficients of variation

### 6.3.2 Results for the determinants affecting mental health literacy of primary healthcare workers

A total of 200 participants were reached for an analysis of variance to examine the possible determinants affecting the MHL of PHC workers. The multifactor ANOVA was based on the survey's background questions describing demographics and training needs (see more in section 5.4). As the three attributes measuring knowledge did not reach the desired alpha value, thus lacking internal consistency, they were excluded from the analysis. The focus was placed on the total sum of the MHLS instrument and the sections describing recognition, attitudes, and knowledge of how to seek information.

A statistically significant association was found between two determinants, level of education and the use of mental health-related assessment scales or screening tools in the workplace, and one or more of the following: (1) MHL as a single concept (measured by the total score of the Mental Health Literacy Scale), and (2) two of its sub-components, attitudes and recognition. However, the third sub-component, knowledge of how to seek mental health-related information, was not found to be significantly associated with either determinant.

PHC workers with higher levels of education were found to be more capable of *recognising mental health-related disorders* ($F = 2.869$; $p = .038$; partial $eta^2 = .046$) compared to those with lower educational qualifications. Upon closer examination, a higher mean score was observed among PHC workers with degree-level education compared to those holding certificates ($p = .053$; pairwise comparison).

The results also showed that, in primary care, those with experience of using mental health-related assessment scales or screening tools in their work were more likely to express *attitudes that promote recognition or appropriate help-seeking behaviour (stigma)* ($F = 4.523$; $p = .035$; partial $eta^2 = .025$). Additionally, they scored above average on the Mental Health Literacy Scale ($F = 5.285$; $p = .023$; partial $eta^2 = .029$).

No positive correlation was found between age-related determinants, such as work experience, and PHC workers' MHL. Similarly, reported in-service training in mental health did not directly increase MHLS scores in the domains examined. The results on the determinants are summarised in Table 10.

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**Table 10.** Determinants affecting mental health literacy among primary healthcare workers (n = 200, modified from Korhonen, Axelin, Stein, et al., 2022).

| | F | Sig. | Partial eta² | F | Sig. | Partial eta² | F | Sig. | Partial eta² | F | Sig. | Partial eta² |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Depend variable** | ***Ability to recognise disorders*** | | | ***Knowledge of how to seek information*** | | | ***Attitudes that promote recognition or appropriate help-seeking behaviour (stigma)*** | | | ***Total score*** | | |
| **Corrected Model** | .888 | .611 | .099 | 1.852 | .015 | .187 | .868 | .637 | .097 | 1.040 | .418 | .115 |
| **Intercept** | 199.963 | .000 | .530 | 111.069 | .000 | .386 | 265.464 | .000 | .600 | 443.926 | .000 | .715 |
| **Determinants** | | | | | | | | | | | | |
| **D5** Education | 2.869 | **.038** | .046 | .901 | .442 | .015 | .302 | .824 | .005 | 1.003 | .393 | .017 |
| **D8** Mental health-related assessment *scales or screening* tools used in work | 1.706 | .193 | .010 | 1.881 | .172 | .011 | 4.523 | **.035** | .025 | 5.285 | **.023** | .029 |
| **D1 – D12:** R squared (adjusted R Squared) | .099 (-.013) | | | .187 (.086) | | | .097 (-.015) | | | .115 (.004) | | |

**Note**. Abbreviations: F = F-statistic; Sig. = significance level (p-value); Partial $\eta^2$ = partial eta squared (effect size)

# 7 Discussion

This study assessed the psychometric properties of the MHL instrument and examined MHL and its determinants among PHC workers in SSA. The research was part of a broader international capacity-building project, co-funded by the EU Commission. The study was conducted in collaboration with local researchers from the region.

The research comprised three phases (Phase I–III). **Phase I** involved the content validation of the MHLS through an expert panel discussion, which included researchers in the field and PHC workers. **Phase II** focused on the psychometric testing of the MHLS and its internal consistency. **Phase III** examined the study's main findings, specifically the MHL of PHC workers and the influencing factors within the SSA context.

In this discussion, the results are debated in relation to previous research, the theoretical framework of SCT, and the integrative literature review conducted to support this dissertation.

## 7.1 Summary of key findings

The starting point of this study was the assumption that sociocultural and professional factors, such as working conditions, training, and individual experiences, may influence the mental health literacy of healthcare professionals, and that it can be improved through educational methods. However, it is essential to consider individuals' social context and environment.

This dissertation indicated that cultural and structural factors may play a key role in the development of MHL and related research. The MHLS instrument, developed on the basis of Western conceptualisations, was found to be applicable in the SSA context with minor adjustments:

- Differing perceptions challenge the use of a tool that places strong emphasis on symptoms and attitudes in clinical settings.
    - In evaluating the content validity of the instrument, differing perspectives were observed between researchers and clinical

PHC workers, which may have been influenced by their differing cultural backgrounds.

- The instrument appeared robust and structurally valid in measuring recognition, knowledge, and attitudes among PHC workers.
    - It does not capture culture-specific issues of the SSA context or elements that support health promotion, such as strong cultural values.
    - The instrument should be tested with similar populations in different contexts. Cultural embeddedness is essential for interpreting the results accurately.
    - The tool is most effective when used as a whole, rather than being divided into sub-attributes.
- MHL is shaped by previous training and routine practices, such as using assessment tools in clinical work. These can also strengthen nurses' MHL
    - Overall, nurses' MHL in this study was found to be moderate, reflecting results reported in other LMICs.
    - Attitudes may vary more strongly at the individual level.
    - The study did not identify explanatory associations with background factors such as age, gender, or previous continuing education.
    - High-quality training and evaluations are needed to further develop MHL in the area.

## 7.2 Validity and reliability of the study designs, settings and sampling techniques

The main limitations affecting the validity and reliability of the main findings relate to the structure of the developed instrument, sampling method, and measurement design. Additionally, there were general challenges related to data collection and the facilitation of the data collection process.

The validity of measurements and the accuracy and consistency of results (reliability) (Polit & Beck, 2018) were enhanced using a mixed-methods approach (Kettles et al., 2011). The theoretical framework of the study was based on SCT (Bandura, 1998), which posits that a nurse operates within their cultural environment, influencing their professional practice, critical thinking, and decision-making in mental health nursing. Additionally, it was assumed that the caring

process is mediated through a dynamic nurse–patient relationship (Peplau, 1992). Although this study focused on healthcare providers rather than patients, the findings are likely to have a direct impact on patient care and its quality.

In line with the chosen design, the study aimed to obtain a quantitatively generalisable sample while also deepening the qualitative understanding of the phenomenon by engaging a broad range of informants, including PHC workers and researchers (Polit & Beck, 2018).

**In Phase I**, the study employed a mixed-methods approach to examine the content validity of the MHLS instrument, incorporating two expert panel discussions. The key objective was to determine whether the concepts and variables of the selected instrument were conceptually valid for measuring the phenomenon in a new, SSA context. A convergent design (Polit & Beck, 2018) was utilised, integrating sampling and collecting both quantitative and qualitative data at the same time from PREs and CEs to complement one another. This approach enabled the triangulation of data sources, ensuring a more accurate and comprehensive representation of the findings.

However, it is important to note that the expert panel method (Schilling et al., 2007) proved challenging in this study. Specifically, when evaluating variables related to attitudes, the personal perspectives of experts may have influenced their judgements, potentially obscuring an objective assessment of the content validity of both the questions and the instrument. To ensure measurement reliability and the accuracy of subsequent conclusions, it is important that researchers remain alert to such biases. Two researchers participated in the data collection, with one leading the discussion and the other taking field notes (Polit & Beck, 2018), which further supports the reliability of the subsequent analysis.

A key limitation of Phase I is the absence of replication, which would have allowed for an examination of the impact of revisions on the content validity of the measure. Nevertheless, in the systematic review by ElKhalil et al. (2024), this phase of the study was objectively assessed for content validity and classified as adequate according to the COSMIN classification.

**In Phase II,** the construct validity and internal consistency of the study's main instrument were examined after its revision and the collection of primary data using a cross-sectional design. PCA analysis method was chosen due to the need to handle a relatively large dataset (Grove, 2013; Maćkiewicz & Ratajczak, 1993). This approach reduced the data and made it easier to examine the theoretical structure in relation to the variables, showing how the PCs formed and how the variables loaded (Brown, 2015; Grove, 2013). PCA is considered, in comparison to exploratory factor analysis, a simpler, but reliable method that produces very similar results (Brown, 2015). Notably, Brown (2015) points out that while PCA is a straightforward method for reducing data and interpreting variance, it is not primarily intended to reveal the

dimensionality or intercorrelations within a measure, as exploratory factor analysis does. Rather, it focuses on the linear structure of the instrument. However, the model's suitability was statistically confirmed using the Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of sphericity (IBM, 2021). The 5:1 sample-to-ratio (Ali Memon et al., 2020), being 175 respondents for the 35 items of the revised MHLS, was also met at different stages of the study (Phases II-III).

The extent to which the MHLS measures a coherent underlying construct was examined through Cronbach's alpha to assess reliability (Tavakol & Dennick, 2011). Given that the MHLS theoretically comprises multiple constructs with varying scales, its reliability was further evaluated by measuring and analysing its sub-attributes.

However, there were certain limitations in assessing the construct validity of the revised MHLS. The measure does not account for measurement errors or establish gold standards for scoring, as such standards are not yet available. Instead, its validity assessment was based on previous research (Korhonen et al., 2019; O'Connor & Casey, 2015) and the reliability evaluations conducted during its original development. The COSMIN checklist was used as a guiding tool in this phase of the study, though it does not guarantee the reliability of the methods employed.

In a systematic review by ElKhalil et al. (2024), the study was found to have performed well in structural validity assessment and internal consistency evaluation. However, based on this review, in addition to the various existing MHLS versions, this revised measure would benefit from further construct validity assessments in the future, such as hypothesis testing, convergent validity, and cross-cultural evaluations (DeVon et al., 2007). Nevertheless, the data were processed and analysed by a statistician with expertise in the field, ensuring the accuracy of the conclusions drawn from the results.

In **Phase III**, MHLS scores were calculated, and the factors influencing them were further analysed using analysis of variance. To assess reliability, relative dispersion was compared using CV values, enabling meaningful comparison across individual items and sub-scales. However, comparing variation across sub-scales is problematic, as differences in item numbers can distort the relationship between the mean and the standard deviation, and consequently the coefficient of variation. This discrepancy undermines the validity of direct comparisons and limits the interpretability of variation across sub-scales. These comparisons are more appropriate at the individual item level; however, no meaningful judgment about MHL among PHC workers can be made based on single items alone.

Summed scores were calculated based on the theoretical framework of MHL, and factors associated with MHL among PHC workers were explored through multifactor ANOVA. However, in relation to the findings from Phases II and III,

three knowledge-related components were excluded from the analysis due to insufficient internal reliability (Cronbach's α). This was most likely due to the reverse-scored items embedded in the instrument and their placement. In such cases, respondents might continue following the earlier response pattern and structure, which could lead to inflated alpha values or even negative item correlations. This runs counter to the basic assumption of internal consistency, such as that underlying Cronbach's alpha model (Tavakol & Dennick, 2011). However, the instrument was not originally intended to be divided into separate parts, and the internal consistency of the overall instrument remained strong.

It is important to note that the study specifically targeted nurses and clinical officers within a particular SSA setting, using a convenience sampling method (Polit & Beck, 2018). As demonstrated in the literature review of this dissertation, PHC consists of various professional groups from diverse cultural backgrounds, working across different fields such as HIV care and maternal mental health. Furthermore, Western research has often emphasised LMIC contexts as a single, unified research domain. However, the SSA region is vast, distinct, and culturally rich. Therefore, the study would benefit from a broader PHC perspective, encompassing multiple professional groups across various healthcare sectors. As the instrument has not undergone cross-cultural validation, assessments of MHL may vary across different settings.

In relation to the cultural context, the study also faced practical challenges. It was coordinated from Finland and although it involved a highly experienced research consortium, working in a different cultural context often presents unexpected challenges and differing practices (Ahrens et al., 2020). During the study, challenges were also observed in the administration and collection of the questionnaires. Local nurses operate under highly demanding conditions, and no specific time was allocated for research-related activities. In this study, time pressure and a challenging work environment may have influenced the data collected from the nurses and affected their ability to concentrate on the study tasks. Enabling research and supporting nurses in this regard would be particularly important in the region.

The present study followed a cross-sectional and descriptive research design. Previous research has raised concerns about the limited evidence on the effectiveness of the MHLS in evaluating intervention outcomes. ElKhalil et al. (2024) clarify that evidence on MHLS responsiveness within an RCT intervention is limited.

The generalisation of the measurements remains an open question for future research, particularly concerning the development of a universally accepted 'gold standard' for assessment. However, in terms of validity and reliability, structural and cultural differences between various versions of the instrument may impact its applicability across different contexts.

## 7.3 Discussion of the main findings

### 7.3.1 Content validity and psychometrics of Mental Health Literacy Scale instrument

**Phase I** primarily aimed to validate the content of the instrument for use in the research environment within the contexts of South Africa and Zambia. A heterogeneous expert panel method was employed, comprising individuals with a research background (PREs) and, in contrast, frontline PHCs working in clinics (CEs) (Schilling et al., 2007). This method provided valuable insights into MHL within the healthcare setting, and its associated factors through qualitative analysis, incorporating perspectives from fieldwork.

The study demonstrated, based on both quantitative and qualitative evaluations, that the MHLS is a valid and relevant tool for investigating the phenomenon within the research area and similar income-level countries. A total of n = 11 items had minor modifications to enhance cultural clarity, as recommended by experts.

As a secondary finding, the qualitative phase of the study also revealed differences in factors related to MHL between the experts (PREs, CEs). The PRE group brought to the research an international, European and SSA broad and multidisciplinary perspective on mental health issues. The CE group had no research background and obviously less work experience and formal training compared to the PREs. Several factors may have influenced this discrepancy, including differences in their understanding of research methodology and educational background (Munakampe, 2020), as well as their ability to separate personal opinions from objective evaluation. Additionally, their general awareness of mental health-related issues, including stigma, was a potential influencing factor (Kapungwe et al., 2011; Mwanza et al., 2011; Mwape et al., 2010). Consequently, participants' personal attitudes were reflected in some of the evaluations, reinforcing the need for further research.

This was the first instance in which the MHLS was validated in a comparable environment, as the original instrument was developed and intended for use in Western healthcare settings, specifically in Australia. The sensitivity of certain items within the instrument was reflected in discrepancies between the CVI item-level and scale-level calculations and qualitative discussions regarding its relevance. The causes of certain mental health conditions, such as anxiety, as well as issues related to stigma, can be deeply personal and influenced by cultural and religious values. This makes objective assessment challenging in a clinical environment. That being said, the study further underscored the importance of validating research methodologies when introducing a novel approach and content into a new cultural

context. However, such validation requires researchers to have a deep understanding of the phenomenon under investigation.

**Phase II** examined the psychometric properties of the revised MHLS instrument following minor modifications. The PCA identified nine principal components, accounting for nearly 60% of the variance in the data. These components collectively formed a linear theoretical structure for the instrument.

Additionally, internal consistency for the entire instrument was robust ($\alpha = .804$) for all 35 items of revised MHLS. Gray (2017) suggests that instruments comprising 20 or more items typically achieve alpha values exceeding ($\geq 0.70$). However, instruments still in the early stages of development may generate alpha values below this acceptable threshold. Thus, both the structure and psychometric properties support the use of this instrument for investigating MHL among PHC workers in South Africa and Zambia. These findings align with subsequent research (ElKhalil et al., 2024), which confirms the robustness of its structure.

The complexity and scoring procedures of the instrument presented notable challenges in assessing internal consistency, as previously discussed in the chapter on reliability. Ultimately, three of the instrument's six sub-attributes, which measure nurses' knowledge related to MHL, produced alpha values below the acceptable threshold. This outcome was likely influenced primarily by the scoring of variables and the application of reverse scaling. Previous literature have similarly noted such challenges when evaluating heterogeneous constructs (Gray, 2017; Waltz et al., 2016a).

It is also important to note that the original instrument was designed primarily for holistic measurement, and its individual sub-attributes were not intended for separate evaluation. This approach is consistent with the reflective structures employed by other psychological instruments. Nevertheless, previous literature has recommended examining similar instruments at the sub-attribute level. As the MHLS comprises various distinct constructs, it is beneficial to evaluate these individually with regard to internal consistency (Gray, 2017; Tavakol & Dennick, 2011). Given that, it can be concluded that when developing multidimensional instruments, it is advisable to adhere to a straightforward structural scaling, ensuring that internal consistency, as defined by the tau-equivalent model (Tavakol & Dennick, 2011) is neither compromised nor inflated.

In conclusion, given that the components of MHL have traditionally been measured using multiple instruments (Jorm, 2019; O'Connor et al., 2014), these findings support the importance, highlighted in earlier literature (Kutcher et al., 2016), of developing reliable tools to capture the construct of the concept comprehensively.

### 7.3.2 Primary healthcare workers' mental health literacy

**Phase III** and the main findings of this dissertation are strongly associated with the MHL of PHC workers, consisting of nurses and clinical officers in South Africa and Zambia. The results were assessed using the revised MHLS instrument, validated in two separate studies (Phases I and II). The study reflected the strategic areas for development identified in the literature review, particularly expanding access to mental health training and CPD, implementing routine assessments, and enhancing healthcare infrastructure and policy support.

Based on the MHLS instrument, the findings indicated moderate levels of MHL among PHC workers. Scores ranged from 76 to 150, with a mean score of 122.3 (SD 12.4), and CV 10%, indicating relatively modest dispersion around the mean compared to the sub-attributes and item-level comparisons. Success in achieving higher scores was particularly influenced by prior education and routine use of screening tools and instruments.

Overall, based on the mean scores, the nurses demonstrated a good ability to recognise mental health conditions, particularly those with a higher educational background. However, there was notable item-level variation, particularly in questions related to attitudes and stigmatising views, when compared to the total scores and their dispersion.

Previous research has highlighted a significant gap in mental health knowledge and attitudes. For example, Tesfaye et al. (2022) found that half of PHC workers demonstrated poor knowledge and held stigmatising attitudes towards mental illnesses and individuals affected by them. Nurses' limited knowledge and negative attitudes have thus been shown to be interrelated (Mutiso et al., 2017). However, in the present study, responses to individual questions revealed considerable variation in attitudes related to mental health stigma. Overall, positive attitudes have been found to support the competence to provide care for mental health conditions (Mutiso et al., 2017).

Nurses may avoid therapeutic interventions (Adjorlolo et al., 2019; Mekonen et al., 2022) when experiencing clinical uncertainty. In this study, a clear majority reported challenges in providing mental health services in their district, which may be seen as having a notable impact on workload and, in turn, contributing to professional uncertainty among nurses.

The overall MHLS results are in line with the findings from the original scale (O'Connor & Casey, 2015) when comparing mean scores. However, when examined by population group, the scores were lower than those reported among mental health professionals in Western comparison groups (mean = 145.49), but comparable to scores observed in general population samples, consisted of students within Australian contexts.

Compared to previous systematic studies (ElKhalil et al., 2024), PHC workers in South Africa and Zambia performed relatively well. In this study, clinical professionals, such as nurses and clinical officers, scored at approximately the same level as medical students in Thailand (mean = 123.09). In contrast, nurses from South Africa and Zambia scored noticeably higher than general population samples such as Chinese teachers (mean = 115.36), Saudi Arabians (mean = 115.5), and Turkish participants (mean = 107.37). This reflects the impact of healthcare training on improving MHL levels.

Appropriate education has been identified as a central factor in supporting the development of mental health competencies within PHC settings (Adewuya et al., 2017; D'Orta et al., 2022). Likewise, in Nakidde et al. (2023) study, educational background emerged as a key determinant of MHL, with nurses lacking formal mental health education reporting challenges in recognising mental health conditions and in acquiring the knowledge necessary for appropriate clinical care. Consistent with these findings, the present study also demonstrated that education was clearly a significant variable. For example, in pairwise comparisons, nurses holding degree-level qualifications performed better in identifying mental health disorders than those with only certificate-level training. Nevertheless, almost 60% of the sample held diploma-level qualifications as their highest level of formal education. Supporting evidence from a comparative study (Oztas & Aydoğan, 2021) further reinforced the positive association between higher educational attainment and improved MHLS scores among healthcare professionals.

This study was part of the MEGA project, which aimed to develop continuing education to meet the mental health care needs in SSA (Lahti et al., 2020). Based on the theoretical assumption of this study, drawing on SCT and Peplau's (1992) theory of interpersonal relations, it can be posited that nurses' strong MHL is inevitably conveyed through their communication within the clinical environment and directed towards the individuals under their care. In mental health practice, interpersonal interaction is particularly emphasised in the context of guidance and counselling. Accordingly, nurses are likely to transmit their competence to patients.

Only a clear minority of nurses, with fewer than 30 per cent, reported having received any mental health-related CPD. The lack of such training has also been highlighted as a challenge in previous studies (Marais & Petersen, 2015). In the present study, CPD was not found to have a statistically significant effect, which may be attributable to variations in training quality, or the pedagogical methods employed. This is a key consideration, as diverse and well-designed pedagogical approaches have been shown to yield positive outcomes within PHC settings (Ayano et al., 2017; Gureje et al., 2015; Kutcher et al., 2017; Oladeji et al., 2023).

Attention should therefore be directed towards individual professional competency needs when developing CPD content. A major challenge in training is

the broad range of professionals working within PHC in SSA countries. As highlighted in the literature review conducted for this dissertation, the needs of PHC workers are both diverse and individual, with the workforce comprising midwives, HIV/AIDS-focused units, and various other specialist areas.

It is important to note that the willingness to engage in mental health training has been documented (Adjorlolo et al., 2019). Furthermore, nurses in some contexts have demonstrated strong motivation for professional development (Nakku et al., 2016), often considering mental health a high priority (Mendenhall et al., 2018). However, continuing education alone may not be sufficient. Several studies have emphasised the importance of structured refresher training programmes in the development of MHL. Such programmes are essential for maintaining and enhancing knowledge, clinical skills, and mental health competencies over time, especially given that the benefits of training may diminish without reinforcement (Gureje et al., 2015; Kutcher et al., 2017; Oladeji et al., 2023).

The influence of age and professional experience on attitudes remains inconclusive according to the study results. Approximately one third of the study population was aged 30 or younger, and around half of the participants had no more than ten years of work experience. However, no significant differences were found between the groups in this study.

Previously, Mosaku & Wallymahmed (2017) found that authoritarian attitudes were less pronounced among more experienced nurses. Furthermore, Sibeko et al. (2018) stated that altering such attitudes through training can be challenging, although positive attitudes may be reflected in improved clinical competence. Based on Peplau's (1992) theory of interpersonal relations, it can be assumed that negative attitudes may have a direct impact on the quality of care received by patients with mental illness.

Supporting mental health nursing and research can help shape attitudes through the use of validated tools and screening instruments. In this study, the use of prior mental health-related screening methods and scales was a significant factor positively correlated with MHL, particularly in relation to attitudes that support symptom recognition and appropriate help-seeking behaviour. Nurses who were accustomed to using screening tools also scored higher on the questionnaire overall than those without such experience. The use of clinical guidelines and screening tools has previously been reported as limited and challenging within PHC in SSA (Abera et al., 2014; Mulango et al., 2018; Wakida et al., 2018), although their importance has since been widely recognized (Grant et al., 2022; Knettel et al., 2023). Nevertheless, in this study, only approximately 50 per cent of nurses reported access to a screening tool or scale for mental health conditions. Overall, routine menta health assessment has been identified as a key area for development within

the region's healthcare services. (D'Orta et al., 2022; Grant et al., 2022; Mall et al., 2013).

Finally, mental related issues are closely linked to its sociocultural context. In particular, PHC professionals are known to reflect the prevailing community views on mental health, as shown in earlier studies (Adewuya et al., 2017; Johnson et al., 2009; Mekonen et al., 2022; Mosaku & Wallymahmed, 2017). According to Jorm (2000), MHL develops through cognitive organisation, whereby professional knowledge is built through education, research, and science. In this way, training and professional influences help shape an individual's knowledge and beliefs, fostering the ability to recognise mental disorders and promoting help-seeking behaviours. It can therefore be argued that without the adoption of professional knowledge in mental health, individuals are less likely to develop the same level of competence, and their understanding of mental health may remain rooted in traditional belief systems. That being said, Jorm's perspective highlights the importance of a shared understanding between professional and community-based concepts of MHL as essential for the collaborative development of care. Consequently, recognising the role of traditional healing and belief systems has been incorporated into strategic recommendations aimed at strengthening mental health training and improving service provision (Bitta et al., 2019; D'Orta et al., 2022; Monteiro et al., 2014). This is particularly relevant for the integration of mental health services into PHC within the region, as well as in efforts to increase public awareness and reduce stigma (Egbe et al., 2014).

# 8 Summary/Conclusions

This study highlighted that addressing mental health challenges is particularly critical in the SSA region, where various resource-related factors, such as poverty and crises, place additional strain on society's resources. PHC is a key institution in promoting the mental health of the population, as it is often the first contact for patients on their treatment path, serving as a gateway to better health capital. PHC workers, who consist of experts from various specialties, need support and training to face these specific mental health challenges. They are key personnel between professional healthcare and the community.

This study aimed to assess the psychometric properties of the MHL instrument and the MHL of PHC workers, focusing on their recognition, knowledge, and attitudes that support positive mental health in PHC settings in SSA. As part of a broader EU-funded international project, the study highlighted the importance of mental health education at the higher education level in the region, as well as the development and validation of scientific methods for assessing MHL.

The limitations of the study were related to challenges in developing the measurement tool, and to the generalisability of the findings. As research on MHL is still in its early stages, the results obtained using the measurement tool should be interpreted with caution in different cultural contexts, and no definitive generalisations about nurses' competence should be made. The concept of MHL is also continually evolving, and further research is needed to support mental health promotion.

Nevertheless, the findings of this dissertation can be viewed as contributing to the development of mental health nursing and its higher education, and as encouraging further research in low-resource settings through the following recommendations.

## 8.1 Implications of the study

This doctoral research was initiated at a time when research on MHL was gradually increasing in the SSA region. At that time, no previous research had been conducted on the MHLS instrument within this sociocultural context, and the concept of MHL was therefore approached according to Jorm’s original definition. Although the

concept of MHL has since evolved alongside its counterpart, *health literacy,* attracting increased research and scholarly interest, the findings of this study remain applicable for comparative analysis with peer studies.

### 8.1.1 Implications for mental healthcare practice

This study suggests that PHC plays an important role in mental health-related issues. However, nurses' MHL and their competence in supporting the positive development of mental health among the population require special attention, and specifically, supportive resources for practical work. It is obviously challenging to develop practical work if the environment is already demanding for carrying out basic tasks, as demonstrated by the challenges encountered in the field during this study. This also places responsibility on policy-makers.

Furthermore, this study recommends that practical nursing care should incorporate various mental health guidelines, protocols, and assessment methods in order to support and standardise high-quality care. In particular, the development of routines highlighted in previous studies appears to support improved mental health competence in nurses' fieldwork. As these routines become embedded in practice, they are gradually reflected in improved patient well-being.

### 8.1.2 Implications for nursing education

The outcomes of this study supported the importance of higher education. Through education aimed at promoting changes in mental health-related knowledge, attitudes, and recognition, PHC workers may adopt new learning approaches, embracing ideas related to transformative learning and critical thinking. This study relied on the theoretical assumption of SCT that nurses are capable of self-regulation, which influences their motivation and learning, thereby supporting the implementation of new knowledge in mental health care. For example, PHC workers trained in the MEGA project to screen children and adolescents with mental health issues, and whose MHL-related knowledge, attitudes, and recognition were studied, will develop the skills and competencies necessary to identify and care for these patients.

Overall, specific issues related to mental health should be firmly integrated into health care education alongside somatic disorders. Furthermore, training programmes should take into account the specific needs of different specialisations, such as midwives, in supporting and promoting mental health within PHC settings.

### 8.1.3 Implications for society and policy

This dissertation raised concerns regarding the challenges and needs associated with mental health policy programs in South Africa and Zambia. A major concern appears to be the significant burden of mental health conditions and the shortage of mental health professionals relative to the population size. This persists despite the fact that political programmes have been in place for some time. In SSA more broadly, efforts have been made to highlight various action plans and development initiatives that also support the integration of mental health into PHC to contribute to resolving these resource-related challenges.

As part of a broader EU-funded project, this study contributed to the integration of PHC and mental health services, aiming to strengthen research activity and related expertise in the region, which has remained limited in the area.

The Western paradigm underpinning this study nevertheless poses its own challenge. This challenge is directly related to the imbalance introduced by Western terminology and research. A desired impact is that the study will contribute to cumulative knowledge and help inform health policy directions while supporting evidence-based decision-making. Through these efforts, as representatives and experts within the community, PHC workers are increasingly well positioned to disseminate mental health knowledge to the wider population. It's important to understand mental health through one's own cultural lens to support genuine progress in the field and to reduce the dominance of Western perspectives.

### 8.1.4 Suggestions for future research

- This study did not examine the role of traditional healing methods and beliefs in PHC collaboration, but their importance and relevance in the SSA context were clearly highlighted in the literature (Bitta et al., 2019; D'Orta et al., 2022; Monteiro et al., 2014)
- The influence of sociocultural factors on perceptions of mental health and on research findings should be carefully evaluated
- Individual differences in educational background, and their impact on knowledge, attitudes, and the development of positive mental health, should be examined to ensure that findings can be effectively translated into practice.
- This study did not examine the capability of the revised MHLS to assess the effectiveness of training in MHL. RCT studies related to MHL are lacking in the area, and this should be increased in practical nursing work as well.

- Research in mental health nursing also requires flexibility in the research environment, especially when dealing with an already challenging topic. In this study, the daily hectic nature of PHC workers was evident at various stages of the research, such as in data collection and panel discussions. However, good facilitation can support the conduct of research and commitment to developing new practices in the area.

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21st, September 2025
*Joonas Korhonen*

Joonas Korhonen

Joonas Korhonen is a registered nurse, holding a master's degree in health sciences, and serving as a senior lecturer at Turku University of Applied Sciences and a doctoral researcher at the University of Turku. Joonas has nearly twenty years of clinical and academic experience in mental health care, psychiatric care, and substance abuse treatment. Joonas actively contributes to multiple global mental health research consortia across Africa, Asia, and Europe, aiding in the development of mental health promotion and its higher education. He has also served on the boards of various academic associations and served as a student member of university administration. In his teaching role, Joonas strives to advance health education by encouraging his colleagues and students to strengthen their global perspective and mobility.

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# List of Figures, Tables and Appendices

## Figures



## Tables

## Appendices

# Appendices

**Appendix 1.** Database search strategy for the literature review.

| | |
|---|---|
| **Pubmed/ MEDLINE**<br><br>**Results: 526**<br><br>**2004 - 23/02/ 2024** | (("nurses"[MeSH] OR "health personnel"[MeSH] OR "primary health care"[MeSH] OR nurse*[tw] OR "Health Personnel*"[tw] OR "Primary Health Care"[tw]) AND ("mental health literac*"[tw] OR ("mental health"[tw] AND ("health literac*"[tw] OR "Health Literacy"[MeSH] or "help-seeking"[tw] OR "help seeking behavior"[MeSH] OR "recognition"[tw] OR "knowledge"[tw] or "Attitude"[tw] OR "stigma"[tw] or "social stigma"[MeSH]))) AND ("Africa South of the Sahara"[Mesh] OR "developing countr*"[tw] OR "developing countries"[MeSH ] OR "LAMIC"[tw] OR "LMIC"[tw] OR "LAMI Countr*"[tw] OR "LMI Countr*"[tw] OR "low income countr*"[tw] OR "middle income countr*"[tw] OR "low-middle income countr*"[tw] OR "lower-middle income countr*"[tw] OR "upper-middle income countr*"[tw])) |
| **Web of Science**<br><br>**Results: 133**<br><br>**"Topic"**<br><br>**2004 - 23/02/ 2024** | (("nurses" OR "health personnel" OR "primary health care" OR nurse* OR "Health Personnel*" OR "Primary Health Care") AND ("mental health literac*" OR ("mental health" AND ("health literac*" OR "Health Literacy" or "help-seeking" OR "help seeking behavior" OR "recognition" OR "knowledge" or "Attitude" OR "stigma" or "social stigma"))) AND ("Africa South of the Sahara" OR "developing countr*" OR "developing countries" OR "LAMIC" OR "LMIC" OR "LAMI Countr*" OR "LMI Countr*" OR "low income countr*" OR "middle income countr*" OR "low-middle income countr*" OR "lower-middle income countr*" OR "upper-middle income countr*")) |
| **Scopus**<br><br>**Results: 366**<br><br>**Article title, Abstract, Keywords**<br><br>**2004 - 23/02/ 2024** | ( ( "nurses" OR "health personnel" OR "primary health care" OR nurse* OR "Health Personnel*" OR "Primary Health Care" ) AND ( "mental health literac*" OR ( "mental health" AND ( "health literac*" OR "Health Literacy" OR "help-seeking" OR "help seeking behavior" OR "recognition" OR "knowledge" OR "Attitude" OR "stigma" OR "social stigma" ) ) ) AND ( "Africa South of the Sahara" OR "developing countr*" OR "developing countries" OR "LAMIC" OR "LMIC" OR "LAMI Countr*" OR "LMI Countr*" OR "low income countr*" OR "middle income countr*" OR "low-middle income countr*" OR "lower-middle income countr*" OR "upper-middle income countr*" ) ) |
| **CINAHL (with EBSCOHost)** | (MH "Nurses+" OR MH "Health Personnel+" OR MH "Primary Health Care" OR nurse* OR "Health Personnel*" OR "Primary Health Care") AND ("mental health literac*" OR (MH "Mental Health" AND ("health literac*" OR MH "Health Literacy" OR MH "Help Seeking Behavior OR |

| | |
|---|---|
| ***Results: 659***<br><br>**2004 - 23/02/ 2024** | "recognition" OR "knowledge" or "Attitude" OR MH "Stigma"))) AND (MH "Africa South of the Sahara+" OR "developing countr*" OR MH "Developing countries" OR MH "Low and Middle Income Countries" OR "LAMIC" OR "LMIC" OR "LAMI Countr*" OR "LMI Countr*" OR "low income countr*" OR "middle income countr*" OR "low-middle income countr*" OR "lower-middle income countr*" OR "upper-middle income countr*") |
| **PsycINFO ja PsycArticles**<br><br>***Results: 66***<br><br>**2004 - 23/02/ 2024** | (DE "Nurses" OR DE "Health Personnel" OR DE "Allied Health Personnel" OR DE "Caregivers" OR DE "Medical Personnel" OR DE "Mental Health Personnel" OR DE “Public Health Service Nurses” OR DE "Primary Health Care" OR DE "Psychiatric Nurses" OR nurse* OR "Health Personnel*") AND (DE "Mental Health Literacy" OR ((DE "Mental Health" OR DE "Athlete Mental Health" OR DE "Mental Health Parity” OR DE "Military Mental Health" OR DE "Youth Mental Health") AND ("health literac*" OR MH "Health Literacy" OR DE "Help Seeking Behavior" OR DE "Health Care Seeking Behavior" OR DE "Stigma", DE "Mental Health Stigma" OR DE "Self-Stigma" OR "recognition" OR "knowledge" or "Attitude"))) AND ( "Africa South of the Sahara" OR "developing countr*" OR DE "Developing countries" OR DE "Middle Income Level" OR DE "Lower Income Level" OR DE "Lower Socioeconomic Status" OR "Low-and Middle-Income Countries" OR "LAMIC" OR "LMIC" OR "LAMI Countr*" OR "LMI Countr*" OR "low income countr*" OR "middle income countr*" OR "low-middle income countr*" OR "lower-middle income countr*" OR "upper-middle income countr*") |
| **Cochrane**<br><br>**Results: 56**<br><br>**2004 - 23/02/ 2024**<br><br>**Title Abstract Keyword - Word variations have been searched with Publication Year from 2004 to present, in Trials** | ("nurses" OR "health personnel" OR "primary health care" OR nurse* OR Health NEXT Personnel* OR "Primary Health Care") AND (mental NEXT health NEXT literac* OR ("mental health" AND (health NEXT literac* OR "help-seeking" OR help NEXT seeking NEXT behav* OR recognition OR knowledge OR Attitude OR stigma OR "social stigma"))) AND ("Africa South of the Sahara" OR developing NEXT countr* OR "LAMIC" OR "LMIC" OR LAMI NEXT Countr* OR LMI NEXT Countr* OR low NEXT income NEXT countr* OR middle NEXT income NEXT countr* OR "low-middle" NEXT income NEXT countr* OR "lower-middle" NEXT income NEXT countr* OR "upper-middle" NEXT income NEXT countr*) |

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