Sociodemographic and Geographic Influences of Mental Health Literacy: A Cross-Sectional Survey among Community Health Clinic Attendees in Tshwane, South Africa

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Article

Sociodemographic and Geographic Influences of Mental Health Literacy: A Cross-Sectional Survey Among Community Health Clinic Attendees in Tshwane, South Africa

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Abstract

Background: Mental health literacy remains low in South Africa, particularly in nonurban settings. This study aims to determine the sociodemographic and geographic influences of mental health literacy among community health clinic attendees. **Methods:** This study adopted a quantitative, cross-sectional study design and was conducted between November 2019 and January 2020. A total of 385 participants were recruited through convenience sampling, with approximately 77 individuals per clinic across five sites. The participants' responses regarding disorder recognition and perceived causes were analyzed via Pearson's chi-square tests. To identify predictors of recognition and perceived causes, hierarchical logistic regression was performed. Statistical significance was set at $p < 0.05$. All analyses were conducted via STATA version 18.1 (StataCorp, Texas, USA). **Results:** The mean age of the study participants was 37.39±11.14 years (range: 13–80). Factors such as geographic location, gender and level of education were significant predictors of recognition. Participants attending urban clinics were more likely to correctly identify correct mental disorders than those attending township clinics were [OR = 0.32; 95% CI: (0.11, 0.93); p value = 0.036]. For correct causes, significant predictors included gender, education level, and geographic location. Urban clinic attendees were significantly more accurate at identifying the correct cause of mental disorders than township attendees were [OR = 0.42; 95% CI: (0.21, 0.83; p value = 0.013]. **Conclusion:** Mental health literacy in Tshwane community healthcare clinics reflects deep-rooted sociodemographic and geographic inequalities. Strengthening township clinic capacity, integrating culturally relevant health education, and prioritizing gender-sensitive outreach are essential to improve the recognition and understanding of mental disorders in underserved communities.

Keywords: logistic regression; mental disorders; mental health literacy

1. Introduction

Mental health literacy (MHL) is increasingly recognized as a critical component of public health, yet it remains unevenly distributed across communities. In many low-resource settings, including parts of Tshwane, South Africa, individuals face significant barriers to understanding, recognizing, and responding to mental health challenges [1–4]. These barriers are shaped by a complex interplay

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of socioeconomic conditions, cultural beliefs, and systemic inequalities [5–7]. Without adequate MHL, communities are less likely to seek timely care and perpetuate cycles of stigma, misdiagnosis, and untreated illness. Addressing this concern is essential for improving mental health outcomes and strengthening the resilience of public health systems. In South Africa, the legacy of apartheid educational inequalities continues to shape access to healthcare and education, particularly in township communities [8–10]. While mental health disorders are increasingly recognized globally, many South Africans, especially those in historically marginalized settings, lack the ability to recognize and understand mental disorders. This gap in MHL not only reflects systemic inequalities in public health infrastructure investment but also perpetuates stigma, particularly among men and delayed treatment in the communities most in need.

There is wide variation in the prevalence of mental health disorders globally; in Hunan Province, China, the prevalence of MHL ranges from 18.7% to 94.15% [11]. Another study in Foshan, China, revealed a significantly lower prevalence of 8.46%, with notable gender disparities, particularly in males having lower MHL than females did [4]. In southwestern Ethiopia, 28% of the participants had poor knowledge [1]. In Jordan, 71.1% of the study participants reported average MHL [2]. In Iran, Solhi et al. reported that 52.2% of study participants reported moderate levels of MHL [3]. This varied prevalence is associated with several covariates, such as sociodemographic, economic, and environmental factors [1–4,11].

Traditional logistic regression remains a widely utilized statistical approach for estimating effects associated with predictor variables in relation to a binary outcome. Its methodological simplicity and interpretability have contributed to its prevalence in empirical research [1–4,11]. However, this approach is limited in its capacity to account for hierarchical data structures and random effects, rendering it susceptible to confounding and biased parameter estimates [12,13]. In contrast, hierarchical logistic regression offers a robust alternative by explicitly modeling the nested or clustered nature of data, thereby mitigating confounding factors and enhancing inferential accuracy [12,13]. This framework enables the inclusion of random effects across multiple levels, facilitating the estimation of group-level variability and improving precision through empirical Bayes shrinkage of group-specific estimates toward the overall mean [14,15].

In the context of MHL, the literature predominantly uses standardized questionnaires to assess public knowledge, attitudes, and practices related to mental disorders [1–4,16–18]. While these instruments provide valuable insights, they often lack contextual richness and fail to capture the subtle recognition of mental health conditions across diverse sociocultural settings. Notably, few studies have incorporated clinical imagery or vignettes to evaluate the recognition and causal attribution of common mental disorders, particularly in low-resource or heterogeneous environments. This study aims to address this critical gap by integrating clinical imagery to assess MHL across urban and township clinic populations in South Africa. By employing HLR, this study further elucidates the sociodemographic, economic, and environmental covariates of disorder recognition and causal beliefs, offering a methodologically rigorous and contextually grounded contribution to the sequelae of MHL after the pandemic.

2. Materials and Methods

Study Design and Setting

This quantitative, cross-sectional, descriptive study was carried out between November 2019 and January 2020. The study was performed in region 1 of Tshwane, in the Gauteng Province of South Africa. Gauteng is one of the nine provinces in South Africa. Tshwane is one of five metropolitan municipalities in Gauteng Province. It is divided into seven demographic regions, namely, Regions 1–7. Tshwane has approximately 2.2 million people, with region 1 having approximately 811 570 people. It has 61 clinics that serve approximately 250 people daily in each clinic. This study was performed at five of these clinics, namely, the Tlamelong Clinic, Kgabo Clinic, Phedesong 4 Clinic,

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Soshanguve Clinic 3, and Pretoria North Clinic. The latter is the only urban clinic. The clinics were randomly selected.

Sample Size, Technique, Inclusion, and Exclusion Criteria

A total of 385 participants were recruited via convenience sampling. This total sample included 77 participants per clinic. The sample size was informed by statistics: a sample of at least 384 is needed for 95% confidence, and a 5% margin of error for a population of more than 1000000 is needed. The inclusion criteria for participation were men or women from all races and ethnic groups aged 15 years and older, and the exclusion criteria were people under 15 years of age and people unable to read or write. Service users waiting to see health practitioners, as well as their accompanying family members, were approached to take part in the study and were briefed about it. This was done in English, isiZulu, or Setswana, as needed, by the second researcher, who can speak all three languages. The fictive clinical case studies and questions about the cases (see Box 1) were also translated into isiZulu and Setswana. In the experience of the second researcher, these three languages are commonly used in the clinics where the study was performed. The participants signed the consent form and were subsequently given the research cases and questionnaire.

Research Tool

The questionnaire was divided into two sections, namely, sections A and B. Section A contained the demographic data, and section B contained the questions used to assess mental health literacy. To assess mental health literacy, the respondents were presented with three fictive clinical case studies that met the DSM-5 criteria for mental depressive disorders, schizophrenia, and generalized anxiety disorders [19]. These disorders were selected because anxiety and mood disorders are common in South Africa. Although the global prevalence of schizophrenia is low, it is nonetheless relatively common. Although this is the case, symptoms of schizophrenia seem to be more likely to be identified as mental disorders, especially in African countries [20,21]. Hence, schizophrenia was included. This study asked participants to choose one answer among various options for three questions about the fictive cases: (1) What type of illness do you think the persons are suffering from? (2) What do you think caused the persons' suffering? (See Box 1: Questions about the cases). Thus, following the work of Jorm et al. and Jorm, two specific aspects of mental health literacy were targeted [22,23]. Similarly, the fictive clinical cases of the questions were also translated into Setswana and isiZulu.

Box 1: Questions about the clinical cases

1.	What type of illness do you think the persons are suffering from?
a)	Physical illness
b)	Mental illness*
c)	None of the above
d)	I do not know
2.	What do you think causes the persons' suffering?
a)	Stress
b)	Punishment from God/ancestors/bewitchment
c)	Brain/genetic/psychological*
d)	None of the above

*Represent the correct response

Data Analysis

Frequency tables (counts and percentages) were constructed for demographic variables (age, sex, marital status, level of education, area of the clinic, and employment status). Pearson's chi-square test was performed for participants who chose the answer for recognition and the cause of their mental disorders. To determine the predictors of recognition and causes of mental disorders, hierarchical logistic regression consisting of three levels was used. level 1 included demographic

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variables (age, sex, marital status, and level of education), level 2 included geographic location, and level 3 included the employment status of the participants. A p value less than 0.05 was considered statistically significant.

Logistic Regression

To select the best model among the group of competing models, the null hypothesis testing approach using the likelihood ratio test and the information theoretic model comparison approaches (Akaike information criterion (AIC) and Bayesian information criterion (BIC)) were used. The model with the smallest AIC, BIC, and significant likelihood ratio (LR) is considered the model that best fits the data.

Likelihood Ratio Test

The likelihood-ratio test (LRT) (often called the likelihood-ratio chi-square test) is a null hypothesis test that helps one choose the "best" model between two nested models [24,25]. Nested models mean that one is a special case of the other. The likelihood ratio test is expressed as the ratio between the log-likelihood of a simpler model and a model with more parameters:

$$LRT = -2\log_e\left(\frac{\mathcal{L}_s(\widehat{\beta_r})}{\mathcal{L}_g(\widehat{\beta_u})}\right) \cdots\cdots\cdots (1)$$

$\widehat{\beta_r} =$ restricted model

$\widehat{\beta_u} =$ unrestricted model

$\mathcal{L}_s(\widehat{\beta_r}) =$ maximum value for the likelihood for the restricted simpler model

$\mathcal{L}_g(\widehat{\beta_u}) =$ maximum value for the likelihood for the unrestricted model with more parameters

Akaike Information Criterion

The AIC is an estimator of prediction error and thereby the relative quality of statistical models for a given set of data, which is useful for comparing model fit and complexity [26,27]. The formula used to obtain the AIC is as follows:

$$AIC = 2k - 2\log_e(\hat{\mathcal{L}}) \cdots\cdots\cdots (2)$$

$k =$ number of estimated parameters in the model

$\hat{\mathcal{L}} =$ maximum value of the likelihood function for the model

Bayesian Information Criterion

The BIC is a statistical method for model selection among a finite set of models, which favors models that are a good fit for the data while penalizing for complexity [27]. The formula used to obtain the BIC is as follows:

$$BIC = k\log_e(n) - 2\log_e(\hat{\mathcal{L}}) \cdots\cdots\cdots (3)$$

$k =$ number of estimated parameters in the model

$\hat{\mathcal{L}} =$ maximum value of the likelihood function for the model

$n =$ number of observations

Ethical Considerations

The study received approval from the Tshwane District Research Committee and Research Ethics Committee of the Faculty of Health Sciences, University of Pretoria. Ethics Reference No.: 543/2019. All participants provided consent to participate in the study, and their information was

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kept anonymous. The participants were informed about the purpose of the study and that they could withdraw at any time without providing any reason.

3. Results

The study included 385 participants with a mean age of 37.39±11.14 years (range: 13–80); additionally, 299 (77.66%) were females, and 86 (22.34%) were males. More than half of the participants were aged 35 years and above, and over 60% of the participants were single, followed by 111 (29.13%) who were married. Approximately 171 (45.12%) and 169 (44.59%) had completed secondary and tertiary education, respectively. Notably, more than 57% of the participants were unemployed, whereas 307 (79.74%) resided in township areas. Table 1 summarizes the participants' demographic and socioeconomic profiles.

Table 1. Summary of participants' socioeconomic and demographic factors.

Variables	n (%)
Age	
< 18	2 (0.52)
18 – 35	184 (47.49)
> 35	199 (51.69)
Gender	
Female	299 (77.66)
Male	86 (22.34)
Location	
Township	307 (79.74)
Urban	78 (20.26)
Marital status	
Single	246 (65.57)
Married	111 (29.13)
Divorced	12 (3.15)
Widowed	12 (3.15)
Level of education	
Never schooled	8 (2.11)
Special school	6 (1.58)
Primary	25 (6.60)
Secondary	171 (45.12)
Tertiary	169 (44.59)
Employment	
Employed	155 (42.12)
Unemployed	213 (57.88)

Sociodemographic, Geographic Location and Socioeconomic Correlates of Recognition and Causes of Mental Health Disorders

With respect to the recognition of mental health disorders, there was a positive correlation between the location of the clinic and the recognition of mental health disorders ($p < 0.05$), and participants attending clinics in urban areas consistently outperformed those in township areas in identifying correct mental health disorders depicted in the clinical pictures. Furthermore, variables such as sex and the location of the clinic were also positively associated with causes of mental health disorders. Great disparities persisted among males and females ($p < 0.05$), with females consistently outperforming males in the correct identification of mental health disorders. Moreover, urbanicity emerged as a significant correlate of the correct identification of causes of mental health disorders associated with clinical findings. Table 2 summarizes the correlates of recognition and causes of mental health disorders among urban and township clinic attendees.

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Table 2. Summary of socioeconomic and demographic correlates of recognition and cause of mental disorders.

Variables	Recognition		p value	Cause		p value
	Yes (n = 264)	No (n = 116)		Yes (n = 264)	No (n = 116)	
Age						
< 18	2 (100%)	0 (0%)		2 (100%)	0 (0%)	
18 – 35	157 (85.33%)	27 (14.67%)	0.646	123 (67.58%)	59 (32.42%)	0.502
> 35	175 (87.94%)	24 (12.06%)		139 (70.92%)	57 (29.08%)	
Gender						
Female	259 (86.62%)	40 (13.38%)	0.887	216 (72.97%)	80 (27.03%)	0.005
Male	75 (87.21%)	11 (12.79%)		48 (57.14%)	36 (42.86%)	
Location						
Township	261 (85.02%)	46 (14.98%)	0.046	202 (66.45%)	102 (33.55%)	0.010
Urban	73 (93.59%)	5 (6.41%)		62 (81.58%)	14 (18.42%)	
Marital status						
Single	212 (86.18%)	34 (13.82%)		169 (69.55%)	74 (30.45%)	
Married	95 (85.59%)	16 (14.41%)	0.520	74 (67.89%)	35 (32.11%)	
Divorced	11 (91.67%)	1 (8.33%)		10 (83.33%)	2 (16.67%)	
Widowed	12 (100%)	0 (0%)		7 (58.33%)	5 (41.67%)	
Level of education						
Never schooled	8 (100%)	0 (0%)		8 (100%)	0 (0%)	
Special school	6 (100%)	0 (0%)	0.351	3 (50%)	3 (50%)	0.088
Primary	24 (96%)	1 (4%)		13 (52%)	12 (48%)	
Secondary	146 (85.38%)	25 (14.62%)		118 (69.82%)	51 (30.18%)	
Tertiary	145 (85.80%)	24 (14.20%)		116 (69.88%)	50 (30.12%)	
Employment						
Employed	134 (86.45%)	21 (13.55%)	0.953	106 (69.28%)	47 (30.72%)	0.810
Unemployed	184 (86.38%)	29 (13.62%)		143 (68.10%)	67 (31.90%)	

Sociodemographic, Geographic Location and Socioeconomic Predictors of Recognition of Mental Disorders

The findings show that urban location emerged as a significant predictor of correct recognition of mental health disorders in level 2. Compared with those attending clinics in township locations, participants attending clinics in urban areas were more likely to recognize the correct mental health disorders shown in clinical pictures [OR: 0.32; 95% CI: (0.11, 0.93); p value: 0.036]. Interestingly, the level of education, particularly primary education, had a greater effect on the recognition of mental disorders, although the results were not statistically significant. Table 3 summarizes the regression analysis of socioeconomic and demographic predictors of recognition of mental disorders.

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Table 3. Hierarchical logistic regression analysis of socioeconomic and demographic predictors of recognition of mental disorders.

Predictors	Level 1 (Demographics)		Level 2 (Geographic location)		Level 3 (Employment status)	
	OR (95%CI)	p value	OR (95%CI)	p value	OR (95%CI)	p value
Age						
> 35	1	1	1	1	1	1
18 – 35	0.78 (0.41, 1.50)	0.458	0.77 (0.40, 1.49)	0.441	0.77 (0.40, 1.49)	0.440
Gender						
Female	1	1	1	1	1	1
Male	0.95 (0.45, 2.00)	0.900	0.95 (0.45, 2.00)	0.886	0.95 (0.45, 2.06)	0.899
Marital status						
Married	1	1	1	1	1	1
Single	0.99 (0.51, 1.93)	0.982	1.21 (0.61, 2.40)	0.592	1.21 (0.61, 2.40)	0.593
Level of education		-				
Tertiary	1	1	1	1	1	1
Primary	3.21 (0.41, 25.35)	0.268	3.24 (0.41, 25.65)	0.266	3.22 (0.40, 25.83)	0.270
Secondary	0.93 (0.50, 1.73)	0.827	0.94 (0.51, 1.75)	0.847	0.94 (0.50, 1.76)	0.844
Location						
Urban	1	1	1	1	1	1
Township			0.32 (0.11, 0.93)	0.036	0.31 (0.11, 0.93)	0.037
Employment						
Employed	1	1	1	1	1	1
Unemployed					1.01 (0.53, 1.96)	0.966

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Sociodemographic, Geographic Location and Socioeconomic Predictors of Causes of Mental Disorders

In level 1 (demographic variables), gender emerged as a significant predictor of the correct identification of mental health disorders [OR: 0.42; 95% CI: (0.24, 0.72); p value: 0.002]. In level 2, the addition of geographic location improved the model significance; moreover, gender [OR: 0.41; 95% CI: (0.24, 0.71); p value: 0.001] and location [OR: 0.42; 95% CI: (0.21, 0.83); p value: 0.013] significantly influenced the ability of participants to correctly recognize the cause of mental disorders. Table 4 summarizes the sociodemographic, geographic location, and socioeconomic predictors of the causes of mental disorders.

Table 4. Hierarchical logistic regression analysis of socioeconomic and demographic predictors of the cause of mental disorders.

Predictors	Level 1 (Demographics)		Level 2 (Geographic location)		Level 3 (Employment status)	
	OR (95%CI)	p value	OR (95%CI)	p value	OR (95%CI)	p value
Age						
> 35	1	1	1	1	1	1
18 – 35	0.62 (0.37, 1.04)	0.070	0.62 (0.37, 1.04)	0.068	0.62 (0.37, 1.04)	0.070
Gender						
Female	1	1	1	1	1	1
Male	0.40 (0.23, 0.71)	0.002	0.41 (0.24, 0.71)	0.001	0.40 (0.23, 0.71)	0.002
Marital status						
Married	1	1	1	1	1	1
Single	1.18 (0.70, 1.99)	0.529	1.42 (0.83, 2.46)	0.202	1.43 (0.83, 2.47)	0.198
Divorced	2.20 (0.43, 11.28)	0.346	1.94 (0.38, 9.89)	0.426	1.95 (0.38, 9.96)	0.422
Widowed	0.33 (0.09, 1.30)	0.115	0.33 (0.08, 1.33)	0.119	0.33 (0.08, 1.35)	0.123
Level of education						
Tertiary	1	1	1	1	1	1
Primary	0.29 (0.11, 0.75)	0.010	0.29 (0.11, 0.74)	0.010	0.29 (0.11, 0.77)	0.013
Secondary	0.92 (0.56, 1.49)	0.724	0.92 (0.56, 1.49)	0.723	0.92 (0.56, 1.51)	0.751
Special school	0.71 (0.10, 4.81)	0.726	0.84 (0.12, 5.81)	0.857	0.82 (0.12, 5.76)	0.843
Location						
Urban	1	1	1	1	1	1
Township			0.42 (0.21, 0.83)	0.013	0.43 (0.21, 0.85)	0.016
Employment						
Employed	1	1	1	1	1	1
Unemployed					0.93 (0.56, 1.54)	0.764

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4. Discussion

Recognition of Mental Disorders

The results showed that the location of the clinic was a significant predictor of correct recognition of mental disorders. Participants who attended clinics in urban areas consistently demonstrated greater accuracy in recognizing mental disorders than did those in township or nonurban areas did, a finding that is consistent with several other studies [16,28,29]. This finding may indicate that urbanicity is associated mostly with access to adequate support and resources, including mental health services and resources. Moreover, nurses in township clinics often receive less training and support than their urban counterparts do [30,31]. In China, a more industrialized context, nurses undergo monthly mental health training sessions lasting 45 - 90 minutes [32]. In contrast, Khairunnisa et al. caution that urbanicity alone does not confer protection against the development of mental health disorders, suggesting that other sociocultural factors may play a role [29]. The reason for this difference could be attributed to cross-cultural differences in parenting and community stigma concerning mental disorders.

Improving the recognition of mental disorders among township clinic attendees requires a multifaceted approach. This includes targeted training and continuous support for registered nurses, the development and dissemination of culturally appropriate educational resources, and community-based awareness campaigns focused on mental health literacy and disorder-specific identification. Moreover, ensuring equitable access to these resources across urban and township clinics is essential for reducing disparities in mental health literacy. These interventions could be embedded within national health strategies to strengthen primary healthcare and promote help seeking among participants.

Causes of Mental Disorders

Factors such as sex, education and the location of the clinic were significantly associated with the cause of mental disorders. Compared with males, females exhibited a greater ability to recognize correct causes of mental health disorders. This finding was reported by several authors, who also reported gendered disparities, particularly that females continually outperform males in recognizing the correct causes of mental disorders [4,18,33,34]. The reason for this result could be that gender differences in South African mental health literacy are driven by factors such as cultural norms around masculinity, help-seeking, societal pressures, and gender-based violence, which disproportionately affect women and influence how men and women recognize and address mental disorders. Moreover, while females often report greater distress and are more inclined to seek help, males may be deterred by societal stigma and traditional expectations of toughness, leading to poorer mental health literacy and help-seeking behavior [35–37].

With respect to level of education, participants who attained tertiary education were consistently more likely to recognize mental disorders than those with primary education. Several studies have also reported that higher education is a protective factor for mental health literacy [4,33,34]. The reason for this finding is that education in South African nonurban areas during apartheid was a segregated system designed to limit Black South Africans to menial labor roles, characterized by the Bantu Education Act of 1953, which created underfunded, inferior schools with inadequate resources, high teacher absenteeism, and a curriculum tailored to service rather than intellectual advancement [38–40]. Although apartheid education ideology has been officially left behind, schools are still under de facto segregation. Whites are in private schools, and suburban schools have the most Colored students, while township schools are overwhelmingly Black, and rural schools tend to have Black and Colored students. Furthermore, the location of community healthcare clinics was a significant predictor of the correct cause of mental disorders. The participants who attended clinics in urban areas outperformed those in township areas, a result well documented in several studies [17,18,41].

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The reason for this finding is that participants in urban locations have easier access to information and health education than do those in nonurban areas [42].

Implications for Policy and Practice

In South Africa's post-apartheid landscape, persistent disparities in education, healthcare access, and infrastructure continue to shape mental health literacy outcomes. This study highlights the urgent need for community-level policies that prioritize mental health literacy in nonurban settings, where a historical lack of investment has left clinics under resourced, and populations underserved. Culturally responsive mental health education, which is delivered in local languages and embedded within primary healthcare services, can bridge knowledge disparities, and reduce stigma, particularly among males. Training community health workers and nurses in nonurban clinics to recognize and address mental disorders is essential. Moreover, gender-sensitive community outreach strategies should be implemented to address the unique barriers men face in help-seeking, shaped by entrenched norms around masculinity. These interventions should be locally driven, supported by national policy, and aligned with South Africa's broader goals of equitable health access and social justice.

5. Conclusions

Mental health literacy in South Africa remains deeply shaped by sociodemographic and geographic divides. This study reveals that township communities, which have long been marginalized by educational policies and ongoing structural neglect, continue to face significant barriers in recognizing and understanding mental disorders. Addressing these disparities requires more than clinical interventions and community-driven, culturally grounded strategies that empower local health workers, dismantle stigma, and promote inclusive mental health education. Bridging the urban–township divide is not only a public health imperative but also a step toward realizing the constitutional promise of equitable healthcare for all South Africans.

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Abbreviations

The following abbreviations are used in this manuscript:

AIC	Akaike information criterion
BIC	Bayesian information criterion
LR	Likelihood ratio
LRT	Likelihood ratio test

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MHL Mental health literacy

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