International Journal of Innovative Research and Scientific Studies, 8(1) 2025, pages: 1987-1993

IJIRSS
International Journal of Innovative Research & Scientific Studies

ISSN: 2617-6548

URL: www.ijirss.com

The relationship between income inequality and mental health: A South African perspectives

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Abstract

This study examined the correlation between rising income inequality and mental health in South Africa, with the objective of comprehending the ways in which inconsistencies in the distribution of wealth contribute to mental health issues. Additionally, it explored possible strategies for policy interventions to reduce these impacts and enhance mental well-being across all socio-economic categories. A logistic regression analysis was employed using data from the National Income Dynamics Survey (NIDS) covering the period from 2008 to 2017. The study outcomes indicate a positive relationship between income inequality and MHBs among low- and middle-income household heads. There is also a positive correlation between younger age and depression. There is a higher likelihood of depression among South African individuals residing in urban areas across all income groups. The study clearly reveals that younger individuals are vulnerable to mental health challenges. The findings indicate the importance of mental health programs focused on the unique stressors faced by youth, such as access to quality education, creation of employment opportunities, and other social challenges.

Keywords: Depression, Income groups, Income inequality, Logistic regression analysis, Mental health.

DOI: 10.53894/ijirss.v8i1.4842
Funding: This study received no specific financial support.
History: Received: 9 January 2025/**Revised:** 13 February 2025/**Accepted:** 19 February 2025/**Published:** 21 February 2025

Competing Interests: The authors declare that they have no competing interests.
Authors' Contributions: Both authors contributed equally to the conception and design of the study. Both authors have read and agreed to the published version of the manuscript.
Transparency: The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.
Institutional Review Board Statement: Not applicable.
Publisher: Innovative Research Publishing

1. Introduction

Despite widespread support for the United Nations' Millennium Development Goals (MDGs), the majority of member states have fallen short in meeting the program's objectives. A major complaint leveled against the program is that it lacked a vision of equitable development [1, 2]. The Sustainable Development Goals (SDGs) include income inequality reduction in response to the growing recognition of the negative consequences of income disparity on economic growth, social cohesiveness, and health outcomes. The correlation between socioeconomic status (SES) and health outcomes, such as mental disorders, has been acknowledged for a long time [3-5].

The Gini coefficient, a popular metric for income inequality, shows that there are large discrepancies in wealth distribution in South Africa, placing the country among the most unequally wealthy worldwide [6]. This inequality is deeply rooted in the country's historical structure, especially during the apartheid era, which established organized economic inequities based on both racial and socioeconomic status. South Africa still has severe economic inequality regardless of the political and economic efforts made to correct these disparities. Although higher levels of absolute material wealth are associated with improved mental health and longer life expectancy within nations [[7, 8], this does not account for the observed disparities among high-income nations in these areas [9]. Not only do these economic gaps hinder social cohesiveness and economic development, but they also negatively affect the psychological and physical well-being of individuals. Most high-income nations have not witnessed reductions in health (including mental health) disparities despite growing national prosperity (increasing GDP per capita) [10, 11].

There is a growing recognition that mental health is a critical element of overall health, as it can affect life expectancy, quality of life, and productivity [1, 3]. There are many elements to the intricate web of connections that exist between socioeconomic status and psychological well-being; one of the most important is income inequality, which has been shown to predict mental health conditions. The correlation between health outcomes and the unequal distribution of financial resources within and between countries, known as "income inequality," has recently come to the center of the challenges faced by South Africans. Increasing economic disparity in South Africa may cause mental health issues such as anxiety, depression, and stress [12, 13].

Other socioeconomic problems, such as high unemployment, poor healthcare access, and ongoing social inequality, amplify these issues. A vicious cycle of poverty and poor health outcomes can be created when mental health concerns lead to even deeper financial difficulties. Since these problems have the potential to impede social stability and economic progress, investigating the connection between income inequality and mental health in South Africa is an important study. South Africa, a country known for its high level of economic inequality, is currently facing a major societal crisis due to the increasing disparity in income [14].

This discrepancy not only indicates economic and social inequality but also presents significant public health issues, notably in the field of mental health. Mounting data suggest a correlation between rising income disparity and negative mental health consequences, such as elevated levels of stress, anxiety, and depression [15]. Nonetheless, little is known about the precise processes by which income inequality impacts mental health in the South African setting. This study aimed to examine the correlation between rising economic inequality and mental health in South Africa, with the objective of comprehending the ways in which inconsistencies in the distribution of wealth contribute to mental health issues. Additionally, it explored possible strategies for policy interventions to reduce these impacts and enhance mental well-being across all socio-economic categories.

1.1. Income Inequality and Mental Health

The apartheid rule gave rise to inequality, which is generally understood to be the state of not being equal, particularly with regard to status, rights, and opportunities [16]. Research indicates that inequality can affect mental health directly or indirectly [1, 17]. The degree of inequality in the allocation of incomes within a society is referred to as income inequality. Numerous studies have continuously shown links between wealth disparity and a variety of detrimental health consequences, such as poor mental health [18, 19].

Health is impacted by wealth inequality through both a material and a mental process, according to Ribeiro, et al. [20]. Through poverty and deprivation, which are linked to higher levels of stress and fewer access points to healthcare [21] and are common in highly unequal societies [22], economic inequality influences health outcomes in the material pathway. According to Wilkinson [23], the psychosocial pathway is based on status competition and insecurity, which can result in low levels of trust and other social problems, including violence and a lack of social cohesiveness. Research indicates that these psychosocial factors may impact an individual's physiological response to prolonged stress, as well as their effects on health-related behaviors and self-esteem [24].

Empirical studies on the relationship between income inequality and mental health problems have shown mixed results. Ribeiro, et al. [20] reported a strong correlation in high-income countries. According to other research, there is a negative correlation between mental health and income inequality [21, 25]. Similarly, having a negative self-perception can have an outsized impact on one's health and well-being [26]. According to Chaka and Adanlawo [27], inequality can put mental health at risk by preventing access to numerous possible sources of social assistance. It is also likely that social isolation and mental health issues are brought on by the significant social divide between those at the top of the economic scale. The researchers hypothesize that inequality may contribute to mental health challenges such as stress.

2. Materials and Methods

The study employs a logistic regression analysis using data from the National Income Dynamics Survey (NIDS) covering the period from 2008 to 2017. The analysis focuses on three distinct models, each corresponding to different income groups: Model 1 for low-income household heads, Model 2 for middle-income household heads, and Model 3 for high-income household heads. The dependent variable in the models is depression, which serves as a proxy for mental health behaviors (MHBs) and is measured subjectively based on self-reported data from respondents.

The primary independent predictor is household income, categorized into the three income groups mentioned above. Control predictors include gender, race (with four racial groups represented: Black, Coloured, Indian/Asian, and White), educational attainment (categorized into no education, primary, secondary, matric, and tertiary education), employment status (unemployed vs. employed), marital status (married vs. unmarried), and age. These predictors are included to account for

their potential influence on the likelihood of depression among different household heads.

The logistic regression models are designed to estimate the probability of experiencing depression across these income groups, controlling for the demographic and socioeconomic factors. The analysis aims to identify the relationships between income inequality and depression while considering the broader context of South Africa's diverse population.

2.1. Model Specification

The study employs panel logistic regression models to estimate the probability of depression among household heads in South Africa, using data from the National Income Dynamics Survey (NIDS) from 2008 to 2017. The models are specified as follows:

$$logit(P(Y_i = 1) = \beta_0 + \beta_1 Income + \beta_2 Gender + \beta_3 Race + \beta_4 Education + B_5 Employment + \beta_6 Geographical\ area + B_7\ Marital\ Status + \beta_8\ Age)$$

Where:

- Y_i is the binary dependent predictor indicating the presence of depression Y_i= 1 if the individual reports depression, 0 otherwise).
- $Income_{it}$ is the main independent predictor for household income, this predictor has been categorized into three groups: low-income (Model 1), middle-income (Model 2), and high-income (Model 3).
- $Gender_{it}$ is a binary predictor indicating the gender of the household head in the analysis (1 = female, 0 = male).
- $Race_{it}$ represents the racial group of the household head, with four categories (Black, Coloured, Indian/Asian, White).
- $Education_{it}$ is the educational attainment of the household head, categorized into five levels: no education, primary, secondary, matric, and tertiary education.
- $Employment_{it}$ is a binary predictor indicating employment status (1 = unemployed, 0 = employed).
- $Geo\ Area_{it}$ is a binary predictor indicating geographical area (1 = urban, 0 = rural).
- $Marital\ Status_{it}$ is a binary predictor presenting marital status (1 = married, 0 = unmarried).
- Age_{it} is a continuous predictor representing the age of the household head, with age squared ($Age_{it}{}^2$)) included to capture potential nonlinear effects.
- ε_{it} is the error term.

The coefficients ($\beta_0; \beta_1; \beta_2; \beta_3 \ldots\ldots\ldots\beta_8$) represent the effect of each independent predictor on the log odds of experiencing depression. Separate models are estimated for each income group to explore the differential impact of income inequality on mental health across low, middle, and high-income households.

2.2. Data

This study draws on the National Income Dynamics Study (NIDS) survey, a long-term household study in South Africa conducted by the Southern Africa Labour and Development Research Unit (SALDRU) at the University of Cape Town's School of Economics. NIDS was launched in 2008 to track a nationally representative sample of households across the country every two years. The aim was to gather detailed information on people's livelihoods; it examines income and expenditure dynamics, asset endowments, household composition, migration, education, employment, and social heritage. The survey is conducted biennially, following the same individuals, known as Continuing Sample Members (CSMs), to capture changes in their socioeconomic conditions [28]. The National Income Dynamics Study (NIDS) covers over 28,000 individuals in 7,300 households across South Africa.

3. Findings

With four racial groups—African, White, Coloured, and Asian/Indian—and notable socioeconomic differences, South Africa is a culturally diverse nation. Due to the significant diversity within the South African population, the analysis adjusts for household cultural, sociodemographic, and economic factors, as has been done in earlier research. These include household income classified as low, middle, and high income (HHincome), gender (female), geographical areas (urban), marital status (married), age of the household head, and race. Table 1 contains details on factors' classifications and summary statistics.

Table 1.
Descriptives.

Factors	Observation	Mean	Std. dev.	Min.	Max.
HHincome	114,616	7158.18	18402.5	1.969	2605524
Depressed	65,016	0.43	0.49	0	1
Urban	123,658	0.49	0.50	0	1
Rural	123,658	0.50	0.50	0	1
Male	123,658	0.43	0.50	0	1
Female	123,658	0.56	0.50	0	1
Unmarried	66,375	0.75	0.43	0	1
Married	66,375	0.24	0.43	0	1
Unemployed	114,610	0.54	0.50	0	1
Employed	114,610	0.45	0.50	0	1
Age	123,658	25.20	20.13	1	107

Factors	Observation	Mean	Std. dev.	Min.	Max.
AgeSQD	123,658	1040.74	1457.30	1	11449
African	123,658	0.81	0.40	0	1
Coloured	123,658	0.13	0.34	0	1
Asian/Indian	123,658	0.02	0.12	0	1
White	123,658	0.04	0.20	0	1
No education	115,014	0.20	0.40	0	1
Primary	115,014	0.36	0.50	0	1
secondary	115,014	0.26	0.44	0	1
matric	115,014	0.10	0.30	0	1
tertiary	115,014	0.10	0.30	0	1

The information provides valuable insights into the socioeconomic landscape. The income of households varies widely, with a mean of 7,158.19 and a large standard deviation, indicating significant economic disparity. The lowest income is nearly zero, while the maximum exceeds 2.6 million, highlighting economic inequality in South Africa. Furthermore, 43% of the assessed individuals in this sample suffer from mental health problems such as depression, representing a significant percentage of the country's population suffering from mental health issues.

The urban-rural divide is approximately even, with 50% of respondents living in each location, implying a balanced distribution across these settings. According to the data, females make up 56.5% of the population. The marital status data shows that 76% of respondents are not married. Employment status demonstrates that more than half of respondents (54.8%) are unemployed, emphasizing employment concerns. Age figures reflect a young population with an average age of 25 years, while education levels reveal that primary education is the most common, with 35.5% of respondents completing it. However, just 8.6% have a university degree, indicating an inadequate higher education achievement rate. The majority of the population in South Africa are Africans (81.4%), with smaller proportions of Coloured, Asian/Indian, and White respondents, reflecting the country's diversity.

3.1. The Marginal Effects

The marginal effects from the three logistic models, which consider depression as the outcome factor, provide a comprehensive view of how various factors influence the likelihood of experiencing depression.

Table 2.
Marginal effects of income inequality on depression.

	Marginal effects (Model 1)	Marginal effects (Model 2)	Marginal effects (Model 3)
	0.03***		
HHincome_low	0.01		
		0.01***	
HHincome_middle		0.00	
			-0.03***
HHincome_high			0.00
	0.01***	0.01***	0.01***
Urban	0.00	0.00	0.00
	0.03***	0.04***	0.03***
Female	0.00	0.00	0.00
	0.01***	0.01***	0.01***
Married	0.00	0.00	0.00
	-0.09'***	-0.20***	-0.90***
Coloured	0.01	0.01	0.01
	-0.06***	-0.07***	-0.06***
Asian/Indian	0.01	0.02	0.02
	-0.15***	-0.15***	-0.14***
White	0.01	0.01	0.01
	0.03***	0.03***	0.03***
Unemployed	0.00	0.00	0.00
	0.01***	0.01***	0.01***
Age	0.00	0.00	0.00
	-0.00***	-0.00***	-0.00***
Age SQD	0.00	0.00	0.00
	-0.00	-0.00	-0.01
Primary	0.01	0.01	0.01
Secondary	-0.03***	-0.03***	-0.02***

	Marginal effects (Model 1)	Marginal effects (Model 2)	Marginal effects (Model 3)
	0.01	0.01	0.01
	-0.04***	-0.04***	-0.03***
Matric	0.01	0.01	0.01
Tertiary	-0.06***	-0.07***	-0.06***
	0.01	0.01	0.01

Note: Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Individuals with low household income have a 3.5% higher probability of experiencing depression. This indicates that lower income significantly increases the likelihood of depression. Being in the middle-income group increases the probability of depression by 1.1%. Although the effect is smaller compared to the low-income group, middle-income individuals still face a higher risk of depression. High household income reduces the probability of depression by 3.3%. This suggests that higher income is protective against depression. Living in urban areas consistently increases the probability of depression by approximately 1.4% to 1.5% across all models. This implies that urban residents are more likely to experience depression than those in rural areas. Being female is associated with a 3.0% higher probability of depression across all models, indicating a consistent trend where women are more likely to report depression compared to men.

The marital status effect (across models) shows 0.01 to 0.013, meaning that being married slightly increases the probability of depression by about 1.2% across all models, suggesting that marriage may have a small but significant impact on mental health. Coloured (across models) indicates -0.0889 to -0.0919, indicating that being Coloured reduces the probability of depression by about 9.0% across all models, indicating a significant protective effect compared to being African. Meanwhile, Asian/Indian (across models) ranges from -0.0595 to -0.0672, meaning that being Asian/Indian reduces the probability of depression by 6.0% to 6.7%, highlighting a significant protective factor compared to being African. Finally, the White race (across models) has an effect that ranges between -0.14 to -0.15, which means being White reduces the probability of depression by approximately 14.2% to 15%, the largest reduction among racial groups, indicating a strong protective effect compared to being African.

Unemployment across models ranges between 0.03 and 0.03, which indicates that unemployment increases the probability of depression by approximately 2.5% to 3.3%. This highlights the significant mental health impact of unemployment, with a consistent trend across all models. The age marginal effects are between 0.0146 and 0.0148, which means that as age increases, the probability of depression increases by about 1.5% per year. This consistent effect across models suggests that older individuals are more susceptible to depression, while the age-squared factor shows a negative coefficient, indicating that the increase in depression probability slows down as individuals age further, suggesting a diminishing effect of age on depression.

Primary education shows no significant effect across models, with a clear indication that primary education does not significantly impact the probability of depression across the models. This is different from obtaining a secondary education (-0.0246 to -0.0290) across models, indicating that having secondary education reduces the probability of depression by approximately 2.5% to 2.9%, suggesting that higher education levels are protective against depression. An additional level of education, such as obtaining Matric across models (-0.0321 to -0.0391), reduces the probability of depression by about 3.2% to 3.9%, indicating that higher education attainment further decreases the likelihood of depression. Finally, tertiary education across all models (-0.05 to -0.06) significantly reduces the probability of depression by approximately 5.7% to 6.7%, emphasizing the strong protective role of higher education against mental health issues.

The results indicate that higher household income, being male, and higher levels of education are associated with a lower probability of depression. On the other hand, urban residence, being female, unemployment, and increasing age are associated with a higher probability of depression. Additionally, race plays a significant role, with Coloured, Asian/Indian, and White individuals showing a lower likelihood of depression compared to African individuals [29]. These findings suggest the importance of socio-economic and demographic factors in influencing mental health outcomes.

4. Discussion

The findings from this study call for a few important implications for public health involvement and social equity, as well as the policy recommendations in South Africa. Firstly, the positive relationship between income inequality and mental health burdens, specifically depression among low- and middle-income household heads, suggests the necessity for more targeted mental health interventions. Easy access to mental health services, particularly for lower-income groups, could assist in alleviating the effects of economic disparities that lead to mental health challenges.

Furthermore, the higher likelihood of depression among South African individuals residing in urban areas across all income groups supports [15] findings, indicating that it is necessary to have an urban-focused MHBs program. This high likelihood of depression in urban environments is often created by greater economic inequality, as well as stress, and highlights the need for support systems such as community mental health programs to reduce elements associated with urban living.

The significant vulnerability of female household heads to depression across all income groups concurs with studies from other researchers, such as González and Vives [8] and Akarsu [29]. These findings highlight the importance of introducing or supporting the already existing programs that promote gender-sensitive plans on mental health. Programs aimed at supporting women, particularly those balancing multiple roles as income earners and caregivers, could help address this gender disparity.

In addition, the lower likelihood of depression among Coloured, Indian, and White household heads compared to Black household heads, even after controlling for income, highlights the persistent influences of South Africa's historical ethnic inequalities. This study agrees with the findings of Adanlawo, et al. [28]. Focusing on the mental health challenges of Black South Africans may require existing policies that rectify the broader social and economic inequities that continue to affect the mental health outcomes of the previously disadvantaged, while also addressing income disparities.

The outcomes from this study indicate a positive correlation between younger age and depression, clearly suggesting that younger individuals are vulnerable to mental health challenges. This finding highlights the importance of mental health programs focused on youth's unique stressors, such as access to quality education, creation of employment opportunities, and other social challenges.

The outcome of this investigation indicating the negative link between human capital and depression underlines the importance of education as a defending factor against mental health issues in South Africa. Therefore, promoting access to education, more specifically in higher education, has the potential benefit of improving both economic prospects and reducing the high prevalence of mental health behaviors. The findings showing that unemployed individuals are more likely to be depressed support the findings of Pfeil, et al. [24], suggesting that employment programs should be prioritized to alleviate unemployment, which could reduce the mental health issues connected to job insecurity and economic uncertainty, potentially leading to substantial mental health benefits. The outcome also shows a higher likelihood of depression among married household heads compared to their unmarried counterparts, indicating that married individuals face more economic inequality, supporting the findings of Mncwango, et al. [30] and Nkomo and Adanlawo [31]. Support services for married couples around financial planning and general counseling could help mitigate depression.

5. Conclusion

The findings from this analysis, therefore, call for a comprehensive method of addressing both the immediate and structural determinants of mental health issues that will consider intersectionality in the context of income and other socio-economic factors to improve the overall well-being of South Africans. Although the study presents insightful contributions to the body of knowledge, it also suffers from several limitations, including the potential oversimplification of income inequality due to the use of broad income categories rather than more precise measures like the Gini coefficient. Additionally, the study may lack comprehensive consideration of socioeconomic factors such as access to healthcare, social support, and housing stability, leading to an incomplete understanding of the drivers of depression. Cultural differences within racial and ethnic groups are also not fully accounted for, which could affect mental health outcomes. Lastly, the study may have unmeasured confounding factors, such as chronic illness or substance abuse, that could influence the observed relationships.

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