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The relationship between social capital and mental health in South Africa: A comparison by gender

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As the candidate’s supervisors, we acknowledge that the dissertation has been submitted for examination. We have also perused the Turn-it-in report for the final dissertation and are of the viewthat any similarities between the candidates work and published or internet sources is incidental.

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Date: 28 November 2024

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Abstract

Social capital, which encompasses the strength of social networks, trust, and community ties, has received growing attention for its influence on mental well-being. Research shows that social capital plays a key role in promoting positive mental health and protecting against mental health challenges, particularly depression. This study examines the relationship between social capital and mental health in South Africa, with a particular focus on how gender may shape these dynamics. Globally, a wide range of studies have demonstrated that social capital can protect against depression and other mental health issues. In South Africa, however, the impact of social capital is particularly complex, shaped by the country's history of colonialism, apartheid, and social fragmentation. Understanding how social capital influences mental health in this context is crucial for addressing mental health challenges in the country.

Using longitudinal data from the National Income Dynamics Study (NIDS), which provides a detailed picture of South African society, this study explores the relationship between social capital and depression for African adults. Depression is measured using the CESD-10 score, which rates the extent of depression on a continuous scale, as well as a binary measure of depression. The study takes a gendered approach to examine how the relationship between social capital and mental health may differ for men and women, using statistical methods such as pooled OLS, fixed effects, and logit fixed effects models.

The study finds that neighbourhood crime and violence are strongly linked to higher levels of depression for both genders, with men being more vulnerable to these environmental stressors. Neighbourhood attachment acts as a protective factor for women, reducing depression. The findings suggest that for men, religious and communal activities provide essential emotional support, while women may benefit from a wider range of social networks. Additionally, the quality of trust with neighbours plays a more significant role in men's mental health.

Keywords: social capital, mental health, gender differences, depression, panel data, South Africa

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List of abbreviations

Abbreviation	Definition
CBT	Cognitive Behavioural Therapy
CES-D	Centre for Epidemiologic Studies Depression Scale
CES-D-10	Centre for Epidemiological Studies Depression Scale (10-item version)
CI	Confidence Interval
CIDI	Composite International Diagnostic Interview
CST	Cognitive Stress Theory
DIS	Diagnostic Interview Schedule
DSM	Diagnostic and Statistical Manual of Mental Disorders
F	Female
FE	Fixed Effects
GAD	Generalized Anxiety Disorder
GBV	Gender-Based Violence
GDP	Gross Domestic Product
GHQ	General Health Questionnaire
HADS	Hospital Anxiety and Depression Scale
IPT	Interpersonal Therapy
K10	Kessler Psychological Distress Scale
M	Male
MDD	Major Depressive Disorder
N/A	Not Applicable
NIDS	National Income Dynamics Study
OLS	Ordinary Least Squares
PHQ-9	Patient Health Questionnaire-9
PTSD	Post-Traumatic Stress Disorder
R^2	R-Squared (Coefficient of determination)
SAD	Social Anxiety Disorder
SASH	South African Stress and Health Survey
SES	Socioeconomic status
WHO	World Health Organization

Chapter 1: Introduction

1.1 Background and motivation

Mental health is crucial to overall well-being, as it influences not only emotional and physical health but also an individual's ability to function in daily activities, engage in social relationships, pursue educational and career opportunities, and maintain financial stability (Friedman et al., 2015; McKenzie et al., 2002). The economic burden of mental health disorders has increased significantly over time, affecting not only individuals but also communities and societies. The World Health Organization (2017) found that the number of individuals suffering from depression globally increased by 18.4 percent between 2005 and 2015, with approximately 322 million people affected in 2015. Depression is more prevalent among women than men, with an estimated 5.1% of the global female population suffering from depression compared to 3.6% of the global male population (World Health Organization, 2017). Research has consistently highlighted the importance of social capital in promoting mental well-being, with individuals reporting better mental health when they have greater social capital, such as civic involvement, trust, and safety in their community (Kawachi et al., 2013; Kawachi and Berkman, 2001). Conversely, a low level of social capital has been linked to poorer mental health outcomes (Somefun & Fatso, 2020). This study aims to investigate the gender differences in the relationship between social capital and the mental health of individuals in South Africa.

Depression is a widespread mental health issue, affecting men and women from diverse backgrounds and regions (World Health Organization, 2017). In developed countries, depression is often linked to factors such as lifestyle, socioeconomic status, and access to healthcare (Kessler et al., 2009). In developing countries, depression can be influenced by cultural and socioeconomic factors, including poverty, lack of access to healthcare, and social isolation (Kessler et al., 2009). The growing prevalence of mental health issues in developing countries, including South Africa, emphasise the need to investigate the underlying social factors that contribute to this phenomenon. Notably, depression is now estimated to be among the top three causes of disability that hinder community progress and development (Seedat et al., 2009; Ataguba et al., 2011). This reality highlights the critical importance of understanding the complex social determinants that drive mental health issues, particularly in a low- and

middle-income country like South Africa, where the impact of mental illness can have far-reaching consequences for individuals, families, and communities (Ataguba et al., 2011).

However, not all groups are equally affected by depression. Gender differences in depression are now notably a significant focus in epidemiological research (Weissman & Klerman, 1977; Kessler et al., 1994; Salk et al., 2016; Platt et al., 2020; Keyes, 2022; Wang, 2022; Kessler et al., 2023). This disparity is particularly notable in developing regions, where women in Africa experience the highest rates of depression, often due to limited resources, funding, and mental health facilities (Reiss, 2013). Social capital theory highlights how relationships within social networks can impact mental health, particularly in low- and middle-income countries, where poverty and lack of education may limit these networks (Lorant et al., 2003; Reiss, 2013). In these settings, individuals may rely more on social capital for mental health support, as formal services are scarce (Rose, 2000; Cattell, 2001).

The relationship between social capital and mental health is complex and multifaceted. Social isolation and lack of social support can increase mental health problems, while strong social connections and networks can provide emotional support and reduce the risk of depression (Cohen et al., 2015). Furthermore, cultural factors such as gender roles and expectations can also play a significant role in the development of depression. Women may be more likely to experience depression due to societal pressures and expectations around their roles and responsibilities (Kessler et al., 2009). In low- and middle-income nations, these cultural factors may be intensified by poverty and limited access to education and job opportunities (Pritchett, 2007). Social capital theory can also be applied to explain why women are more likely to experience depression than men. Structural gender inequalities, as well as cultural norms and standards, can contribute to depressive symptoms among women. For instance, in many cultures, including South Africa, women are often expected to be submissive to male partners and assume the role of primary homemakers and caregivers. These traditional gender roles can lead to feelings of oppression, low self-esteem, and limited social support, all of which contribute to higher rates of depression among women (Connell, 2005; Kleinman, 2009; Martin & Jang, 2020; World Health Organization, 2021). Women's social capital, or their access to resources, decision-making power, and social networks, is often restricted, which makes it more difficult for them to seek help and improve their mental health.

In South Africa, depression is a major mental health issue, and socio- economic problems make it worse. Poverty, unemployment, and a lack of access to mental health care are big factors that

contribute to depression for both men and women. However, the impact is often more pronounced for women, who face the dual burden of economic hardship and traditional gender expectations. Cultural gender norms further exacerbate depression in South Africa. Traditional views that position women as caregivers and men as financial providers can limit women's social capital, reducing their access to resources, decision-making power, and opportunities for empowerment. This lack of social capital contributes to higher rates of depression among women, as they often feel excluded from important societal roles (Marmot, 2004). For men, societal expectations of stoicism and emotional restraint can discourage them from seeking help for mental health issues, leading to untreated depression (Mutyambizi et al., 2019). The gender gap in depression may shift over time, with recent studies suggesting that younger generations may experience smaller differences, possibly due to changes in social capital and evolving gender roles (Platt et al., 2020).

In this study, social capital is defined as the network of relationships and resources that individuals have access to. This can include social cohesion, social support networks, community participation, resources, and lastly social trust. By examining the relationship between social capital and depression, this study aims to provide a better understanding of how social capital can affect mental health outcomes for men and women in South Africa.

1.2 Problem statement

The existing research on mental health and social capital in South Africa suggests that women have lower levels of mental well-being, as well as less access to social resources, compared to men (Steinat and Craske, 2017; Carmichael & Whittle, 2015; Kagee & Jones, 2017; Seedat et al., 2009; Kuehner, 2017). However, while studies have shown that certain types of social capital are protective of mental health (Kawachi et al., 2013; Kawachi and Berkman, 2001), the existing literature fails to account for these gender differences. The objective of this research study is therefore to explore the relationship between social capital and mental health, placing a particular emphasis on gender differences. Specifically, the study seeks to examine how various forms of social capital such as social support, social networks, and community connections, differentially impact mental health outcomes for men and women. By investigating these disparities, the research aims to shed light on the distinct mental health challenges faced by each gender. The overall objective of the study will be addressed by answering the following research questions:

- How do levels of social capital and mental health compare between men and women in South Africa?
- How does the relationship between various aspects of social capital and mental health differ between men and women in South Africa?
- To what extent does the estimated relationship depend on how mental health is measured?

By addressing these research questions, this study aims to explain the intricate relationship between social capital and mental health, with a particular focus on how gender influences this dynamic. This dissertation is organized as follows to explore various aspects of the topic. Chapter 2 provides an overview of both theoretical and research-based literature on gender differences in mental health. It examines the factors that connect gender to mental health and social capital and discusses previous studies in this area. Chapter 3 focuses on the National Income Dynamics Study panel data, highlighting the key variables used in the analysis. It also presents the descriptive statistics for the sample used in the study. Chapter 4 explains the regression method applied and then presents the results, followed by a discussion of the findings. Finally, Chapter 5 offers the conclusion of the dissertation.

Chapter 2: Literature review

2.1 Introduction

The study of social capital and its influence on mental health has attracted increasing attention in the field of social sciences, particularly in the context of social capital (Seidman, 2008). In South Africa, a nation marked by profound socio-economic inequalities and a legacy of apartheid, the role of social capital as a potential buffer against mental health has emerged as a critical area of study (Siedman, 2008; Lau and Ataguba, 2015; Somefun and Fotso, 2020). The benefits of social capital, however, are not uniformly distributed, and differences arise based on gender (Claridge, 2004; Myroniuk, 2016; Levesque and Quesnel-Vallée, 2019). Men and women often navigate unique set of socioeconomic challenges. Women in South Africa face higher rates of gender-based violence, social and cultural norms, and disproportionate caregiving responsibilities (single parenthood), all of which uniquely impact their mental health outcomes compared to their male counterparts. (Myroniuk, 2016; Claridge, 2004; Kilby 2002; Fox and Gershman 2000; Molinas 1998). Understanding these gendered differences is essential, as it allows for a more comprehensive analysis of how social capital operates as a determinant of mental health within complex socio-cultural nations (Kilby 2002).

This literature review will begin by examining and understanding theoretical frameworks on mental health at a global level and then proceed to the South African context. It will further delve into the gender gap in mental health. The structure of the review is organized as follows: Section 2.2 discusses the theoretical frameworks on mental health. Section 2.3 addresses the gender gap in mental health, while Section 2.4 introduces the concept of social capital theory. In Section 2.5, the review will discuss the relationship between social capital and mental health, highlighting relevant theoretical models and gendered perspectives. Following this, Section 2.6 will delve into empirical literature, presenting studies that explore socioeconomic factors associated with mental health, the gender gap in mental health, and the links between social capital and mental health. Thereafter, the literature review is concluded in section 2.7.

2.2 Theoretical frameworks on mental health

There is a lot of theoretical research on mental health, and these studies serve as important frameworks for understanding mental health concepts. These theories provide organized ways to examine mental health. This section of the literature review will look at several key theories, such as the biological model, social model, psychological model, and the interpersonal model.

2.2.1 Biological Model

The biological model of depression is derived from the early theories that linked emotional disorders to simple biological causes of depression (Cameron et al., 2018). The foundational theories laid the groundwork for later research, with key figures such as Emil Kraepelin in the 19th century identifying manic-depressive illness, which eventually influenced the biological approach to understanding depression (Trede et al., 2005; Cameron et al., 2018; Bennett, 2024). The model posits that mental health disorders, such as depression, are influenced by biological factors, including genetics, neurochemistry, and neuroanatomy (Brouillard et al., 2016; Wang et al., 2020; Remes et al., 2021). This suggests that abnormalities in the structure and function of the brain, as well as dysregulation of neurotransmitters particularly serotonin and dopamine, as well as hormones, play a significant role in the development and progression of depression (Nolen-Hoeksema, 1987; Zhang et al., 2018; Hammarström et al., 2009; Morris et al., 2020). Studies that support this model argue that genetic factors have been shown to contribute to the risk of developing depression (Hammarström et al., 2009; Remes et al., 2021; Wang et al., 2020).

Family studies have demonstrated that individuals with a family history of depression are at a higher risk of developing the disorder (Kendler, 2013; Flint & Kendler, 2014; Flint, 2023), this further supports the genetic influence on depression. We are therefore brought to an informed understanding of how genetic factors play a significant role in the development of depression. Kendler (2013) found that individuals with a family history of depression were more likely to experience symptoms of depression in response to stress, and that this was related to genetic variations in the serotonin transporter gene. Flint and Kendler (2014) further explore this to find that certain genetic variations can affect an individual's risk of developing mental health disorders over time. For example, in their study they say that genetic variations that affect serotonin levels or dopamine receptors may increase an individual's risk of developing depression or other mental disorders in their lifetime. This is likely to occur when individuals are experiencing stressful life events.

Research highlights a significant gender difference in the prevalence of depression, emphasizing how dysfunctions in neurotransmitters can influence emotional processing and stress responses, which are key factors in the development of the disorder (Belmaker & Agam, 2008). This dysfunction contributes to women being approximately twice as likely to experience depression compared to men (Kessler et al., 1993). This difference is largely

attributed to biological factors, particularly hormonal regulation. Fluctuations in hormones, such as estrogen levels during the menstrual cycle and menopause, can affect mood and emotional stability, further increasing women's vulnerability to depression (Belmaker & Agam, 2008), while lower testosterone levels are associated with increased depression risk in men. Genetic variations, such as those in the serotonin transporter gene, may have a stronger connection to depression in women (Kendler et al., 2013), influencing neurotransmitter systems. Additionally, women's stronger immune response to stress might contribute to their higher depression susceptibility (Beck, 1967). The biomedical model suggests that the gender differences in depression arise from a complex interplay of hormonal, genetic, neurological, and immune factors.

2.2.2 Psychological model

Freud's psychoanalytic approach laid the foundation for the psychological model of depression, suggesting that depression stemmed from unconscious conflicts and repressed emotions (Freud, 1917). They framed depression as a reflection of deep-seated psychological issues. This perspective influenced the development of early therapeutic practices that focused on introspection and insight (Freud, 1917). In contrast, behaviorist perspectives emerged in the mid-20th century, emphasizing observable behaviors and environmental influences over internal psychological processes (Skinner, 1984). The behaviorists theorized that depression could result from learned responses to negative stimuli (Skinner, 1984). As the field progressed, cognitive models gained prominence, particularly with the contributions of key figures like Aaron Beck, who introduced the concept of the negative cognitive triad, arguing that dysfunctional thought patterns could exacerbate depressive symptoms (Beck, 1976; Beck, 1987).

Albert Ellis further developed cognitive theories with his Rational Emotive Behavior Therapy (REBT), which emphasized the role of irrational beliefs in the onset of depression and advocated for cognitive restructuring as a means of treatment (Ellis, 1962). Cognitive factors are central to this model, particularly the concept of the negative cognitive triad, which includes distorted perceptions of the self, the world, and the future (Beck, 1976). This triad is commonly manifested in cognitive distortions such as all-or-nothing thinking and catastrophizing, that reinforce negative self-beliefs and pessimistic worldviews, leading to pervasive feelings of hopelessness (Hollon et al., 2002). In South Africa, cultural narratives and historical factors may exacerbate these cognitive distortions, particularly in communities facing socio-economic

hardship, where negative beliefs about one's future may be compounded by systemic obstacles (Seedat et al., 2009).

Emotional factors further influence depressive symptoms, as individuals often experience intense feelings of sadness, frustration, and irritability. Behavioral factors are also important in understanding depression. The difference between engaging in meaningful activities and avoiding them is key to understanding depression (Martell et al., 2001). In the context of South Africa, social interactions, shaped by communal ties and cultural expectations, can significantly impact one's experience of depression. Positive social support networks can mitigate symptoms, whereas social isolation may amplify feelings of despair, particularly in marginalized groups (Seedat et al., 2009). South African studies context have integrated these theories with local cultural perspectives, recognizing the significance of social and contextual factors, such as socio-economic challenges and cultural beliefs, in understanding depression (Seedat et al., 2009).

2.2.3 Social model

The understanding of depression has evolved significantly over time, transitioning from predominantly medical theories to more nuanced social perspectives (Beck, 1967; Cohen & Williamson, 1991). The social model of depression suggest that depression is significantly influenced by societal factors rather than solely individual psychological or biological determinants (Beck, 1987; Cohen & Williamson, 1991). However, the emergence of the social model in the late 20th century began to emphasize the influence of sociocultural factors, such as social support, socioeconomic status, and community engagement, on mental health outcomes (Horton et al., 2017). Key figures like Aaron Beck and later researchers highlighted the interplay between individual cognition and social context, paving the way for a more nuanced understanding of depression (Beck, 1987; Cohen & Williamson, 1991). Studies such as those by Marmot et al. (2008) in the UK revealed a consistent association between social determinants and mental health disparities. Highlighting the importance of understanding depression within the context of one's social environment and relationships, which includes family dynamics, peer connections, and community support.

However, when examining the South African context, these trends take on unique characteristics. The legacy of apartheid and ongoing socio-economic inequalities profoundly affect mental health. Research indicates that social stressors such as poverty, unemployment, and lack of access to healthcare significantly contribute to higher rates of depression (Parker,

2018). Consequently, integrating the social model into the understanding and treatment of depression in South Africa is crucial for addressing these systemic issues and promoting mental well-being (Sibanda et al., 2021). For example, Cohen (2023) conducted a study exploring the contextualized understanding of depression among the Xun and Khwe communities. Their findings highlighted how traditional beliefs, and social structures significantly shape individuals' perceptions and experiences of depression, emphasizing the necessity of integrating social factors into the understanding of mental health. This illustrates a critical movement towards recognizing the interplay between social environments and mental health, extending the framework of the social model beyond western-centric views and emphasizing its relevance in diverse cultural contexts (Cohen, 2023).

Empirical studies highlight the challenges in measuring social factors when examining depression relative to sociocultural factors. One prominent challenge in measuring social factors is the complexity and variability of social capital, which encompasses social networks, support systems, and community engagement (Putnam, 2000; Berkman & Glass, 2000). These elements can be difficult to quantify, leading to inconsistencies in research findings. Nevertheless, numerous studies have established a clear correlation between social factors and depression rates. For instance, Putnam (2000) found that individuals with lower social support and weaker social ties are significantly more likely to experience depressive symptoms. In South Africa, the impact of socioeconomic disparities and historical injustices further exacerbates mental health challenges, as highlighted by Olsson et al. (2020). Their research indicated that marginalized communities often suffer from higher levels of depression, driven by factors such as poverty, discrimination, and a lack of access to mental health services.

2.2.4 Interpersonal model

Historically, the model draws from psychodynamic theories that emphasize the impact of relationships and attachment (Hammen, 2005). Key contributors, such as Harry Stack Sullivan and Aaron Beck, have been pivotal in emphasizing the relational aspects of mental health, laying the groundwork for later developments in interpersonal therapy (IPT) (Sullivan, 1953; Beck, 1976). In connection with other psychological theories, the interpersonal model shares similarities with cognitive-behavioral theories, particularly in recognizing the importance of thought patterns and behaviors in maintaining depression; however, it diverges by placing a stronger emphasis on interpersonal contexts (Johnson et al., 1999). The model intersects significantly with research on social support, positing that the quality and stability of one’s

social relationships can mitigate or exacerbate depressive symptoms, thereby highlighting the crucial role of community resources (Cohen & Wills, 1985).

This intersectionality is viewed particularly within the context of marriage and household structures. High-quality, stable marital relationships often serve as protective factors against depression, providing emotional support and resource sharing, which are critical during times of distress (Kessler, 1997). Research has indicated that couples with strong interpersonal connections experience lower rates of depression and related symptoms compared to those in tumultuous or unsupportive marriages (Kessler, 1997; Hammack et al., 2004). The quality of these relationships not only impacts the individual's mental health but also contributes to the overall well-being of households.

In South Africa, however, the intertwining of marriage, interpersonal relationships, and social support is complicated by factors such as gender-based violence (GBV), which has been alarmingly prevalent within the country. Studies have revealed that GBV can significantly undermine the quality of marital relationships, leading to detrimental effects on mental health for both victims and perpetrators (Jewkes, 2002). The trauma and psychological distress stemming from such violence can exacerbate depressive symptoms, thus challenging the protective functions typically associated with stable, supportive interpersonal relationships. The South African setting further complicates this issue, as cultural norms and socio-economic pressures can create environments where victims may feel trapped in abusive relationships due to financial dependence or fear of stigmatization (Rampedi et al., 2019).

Within the interpersonal model of depression, Joiner (2005) emphasizes that the quality of relationships strongly affects mental health, with disruptions in relationships like loss or conflict worsening depression. This is true across cultures, including in South Africa, where social and economic challenges amplify these effects. Negative behaviors, like rejection and criticism, can worsen relationships and lead to isolation, increasing the risk of depression (Tanner & Jones, 2018; Joiner, 2005). In South Africa, factors like gender-based violence (GBV) and socio-political stress make these relationship struggles even more impactful, particularly in disadvantaged communities (Rasool et al., 2019).

2.3 The gender gap in mental health

The prevalence of mental health disorders is a significant concern globally, with a rise in studies highlighting notable gender differences. One such study, conducted by the World Health Organization (WHO), found that women are more likely to experience depression, anxiety, and

somatic symptoms than men, with 21 percent of women experiencing depression and 14 percent experiencing anxiety, compared to 12 percent and 8 percent of men, respectively (WHO, 2017). This gender gap is evident across various regions, including the global South. In South Africa, the South African Stress and Health (SASH) survey (2009), denotes that approximately 16.5 percent of South Africans experience a mental disorder at some point in their lives, with significant variations observed between genders (Williams et al., 2020). Specifically, the prevalence of depression is reported to be higher among women, whereas men are more likely to experience substance use disorders and engage in behaviors leading to violence and aggression (Parker et al., 2018).

Early studies in the field of gender and mental health focused on examining the prevalence and types of mental health disorders experienced by men and women. During the 20th century, early research on gender differences in mental health often focused on the prevalence of mental disorders and symptoms among men and women. For example, studies such as those by Ely et al. (1997) and Kessler et al. (1994) examined the gender-specific rates of depression and anxiety disorders, highlighting the differences in presentation and diagnosis between genders. As the field evolved, researchers began to explore the underlying factors contributing to gender differences in mental health outcomes. For instance, studies by Nolen-Hoeksema (1991) and Addis and Mahalik (2003) delved into the role of gender norms and societal expectations in shaping individuals' mental health experiences.

Together, these studies illustrate how deeply ingrained gender norms and societal expectations systematically affect mental health outcomes for both men and women. Nolen-Hoeksema (1991) highlighted the risk factors associated with women’s tendencies to ruminate and thus remain vulnerable to depression (Nolen-Hoeksema ,1991). While Addis and Mahalik (2003) highlight how masculine norms can prevent men from accessing support and expressing their emotional struggles, ultimately leading to poorer mental health outcomes.

2.3.1 Societal expectations and gender norms

Traditional gender roles significantly influence mental health outcomes, reflecting societal norms that dictate expected behaviours, responsibilities, and attributes of men and women. These roles often impose rigid expectations that can lead to stress, anxiety, and depression when individuals feel pressured to conform to them (Addis & Mahalik, 2003). For instance, men are typically socialized to embody traits such as strength, emotional strength, and independence; conversely, women are often expected to portray nurturing, empathetic, and

supportive characteristics (Mahalik et al., 2007). The pressure to adhere to these roles can result in a detrimental impact on mental health, particularly when individuals have trouble in meeting these societal expectations.

Addis and Mahalik (2003) highlight that, for men, the cultural emphasis on emotional suppression and a lack of social support can hinder their ability to seek help for mental health issues. Research has shown that compared to women, men are less likely to disclose emotional struggles and are often discouraged from expressing vulnerability due to fears of societal backlash or stigma (Addis & Mahalik, 2003). This suppression of emotions can culminate in higher rates of substance abuse and suicidal ideation among men, as they may resort to unhealthy coping mechanisms when faced with psychological distress (Nolen-Hoeksema, 2012). Conversely, women, while encouraged to express emotions and seek support, may face challenges, such as societal pressure to prioritize caregiving roles over personal well-being. This can lead to feelings of guilt, overwhelm, and anxiety, resulting in higher rates of depression and emotional exhaustion (Coyle & Kelsey, 2016).

Moreover, the intersectionality of gender roles with other social identities compounds these mental health disparities. Women of colour, for example, may face not only the pressures of traditional gender expectations but also the weight of racial and socioeconomic disparities, exacerbating their mental health challenges (Nolen-Hoeksema, 2012). Discrimination and limited access to resources can further isolate these individuals, leading to diminished social support networks and, subsequently, poorer mental health outcomes (Crenshaw, 1991). Thus, traditional gender roles, reinforced by societal expectations, contribute to a complex web of mental health issues.

2.3.2 Gender-specific stressors and traumas

Throughout the 20th century and into the early 2000s, there was a gradual recognition of the need for a gender-sensitive approach to mental health research. The work of scholars such as Levant et al. (1992) and Rosenfield (2000) emphasized the importance of considering gender-specific stressors and traumas in understanding mental health disparities between men and women. In today's context, gender-based violence is a major trauma for women of all nations, races, and ages. According to the World Health Organization (WHO), 1 in 3 women (35 percent) have experienced physical or sexual violence by a partner, and 1 in 10 women (18 percent) have experienced sexual violence by someone other than a partner (WHO, 2017). The consequences of gender-based violence are economic, physical, and mental health-related, as

women who experience such violence are more likely to suffer from depression, anxiety, and post-traumatic stress disorders (Levant et al., 1992; Rosenfield, 2000).

Compared to other countries, Africa holds the highest percentage (30 percent) of women aged 15-49 who have experienced gender-based violence. This alarming statistic is not surprising, given the deeply entrenched cultural and societal norms that perpetuate gender inequality and violence against women in many African countries (WHO, 2017). The cultural narrative within the African population is that women are inferior to men and are expected to be submissive and obedient (Rosenfield, 2000). This cultural narrative is often reinforced by religious teachings, traditional practices, and societal norms, making it difficult for women to challenge their subordinate status. Additionally, the economic inequality and poverty that many African women face also contribute to GBV (Rosenfield, 2000).

According to Hassim (2006), in many African countries, women have limited access to education, employment, and economic resources, and this renders them vulnerable to exploitation and violence. This highlights the growing number of studies on gender differences in mental health, where researchers aim to understand how gender-specific traumas impact mental health across different genders. Towards the late 2000s Brown and Keel (2015) explored the epidemiology and phenomenology of mental disorders in men, shedding light on the prevalence of these conditions based on gender. Subsequent research expanded on this foundation, investigating the underlying factors contributing to gender differences in mental health outcomes.

2.4 Social capital theory

The social capital theory has its roots in the work of early scholars such as Pierre Bourdieu and James Coleman, who emphasized the importance of social relationships and networks in shaping individual behaviour and outcomes (Bourdieu and Coleman, 1977). Bourdieu introduced the concept of social capital as part of his broader theory of cultural capital, highlighting the benefits derived from social relationships and connections in society (Bourdieu, 1984). Coleman, on the other hand, focused on the role of social networks in facilitating the exchange of resources and information among individuals, highlighting the potential benefits of social capital for individual and collective well-being (Coleman, 1988).

Over time, Social Capital theory has evolved and expanded, with scholars like Robert Putnam and Nan Lin further developing and refining the concept. Putnam, in his influential work

"Bowling Alone," highlighted the decline of social capital in American society and its implications for civic engagement and social cohesion (Putnam, 2000). According to Putnam (2000), social capital refers to the connections and resources that individuals can access through their social networks. These connections can provide support, information, and access to opportunities that can enhance one's quality of life. Lin (1999); De Silva et al., (2005); Almedom (2010); Ramlagan et al., (2013); Lau and Ataguba (2015), emphasized the different forms of social capital, such as bonding and bridging capital, and their varying impacts on individual and societal outcomes. Lin (2000) continues stressing the network perspective of social capital and the significance of network links and structural interactions for gaining access to resources, information, and social support.

2.4.1 Forms of social capital

Social capital can be understood in different ways, building upon the instilled foundations of social capital, Robert D. Putnam (2000) described social capital through a more practical lens, distinguishing between different types of social capital. These include structural social capital, which examines the overall networks and connections within a community, cognitive social capital, which relates to shared norms and values that facilitate communication, and relational social capital, which emphasizes the trust and personal relationships developed within networks (Putnam, 2000). Alternatively, social capital can also be classified into bonding, bridging, and linking social capital (Claridge, 2014).

Bonding social capital refers to the connections within a homogeneous group, fostering strong ties and support systems, while bridging social capital highlights the ties that connect different social groups, enabling the sharing of resources and information (Claridge, 2014). Linking social capital, on the other hand, pertains to networks that connect individuals to institutions and resources beyond their immediate social circles, further enhancing their ability to access opportunities and support. Scholars such as Nan Lin, Ronald Stuart Burt, Julia Häuberer, and Karen S. Cook have contributed to refining these definitions over the years, highlighting the multifaceted nature of social capital and its implications for social cohesion, cooperation, and collective action (Claridge, 2014).

Although social capital theory provides a framework for understanding the importance of social connections and relationships in society, there are also some conflicting concepts within the theory. One such conflict arises between the concepts of bonding social capital and bridging social capital. The conflict arises when there is tension between the benefits of bonding social

capital and bridging social capital (Putnam, 2000). While bonding social capital can create strong social ties and support networks within homogenous groups, it may also lead to social exclusion, insularity, and in-group favoritism. In contrast, bridging social capital promotes diversity, innovation, and social integration, but it may lack the depth and intimacy of relationships found in bonding social capital (Woolcock & Narayan, 2000).

Another conflicting concept within social capital theory is the debate over the relationship between social capital and social trust. Some scholars argue that social capital is built on a foundation of trust, reciprocity, and norms of cooperation, suggesting that trust is a key component of social capital (Putnam, 1995). According to Putnam (2000), the more trust is cultivated within a community, the stronger the social capital becomes, fostering both types of bonding social capital, through close-knit relationships, and bridging social capital, through connections that span diverse groups. However, others argue that trust is not always necessary for the formation of social capital, as networks and connections can still provide access to resources and opportunities even in the absence of trust (Portes, 1998).

2.4.2 Is trust a key component of social capital?

According to a corpus of social capital scholars, trust is indeed a crucial component of social capital. Putnam (1995) emphasizes that "trust is the foundation of social capital" (p. 666). This notion is echoed by Fukuyama (1995), who argues that trust is a necessary condition for social capital to exist, as it enables individuals to cooperate with one another. Similarly, Coleman (1990) notes that trust is a fundamental element of social capital, as it allows individuals to rely on others and to coordinate their actions. Moreover, Bourdieu (1986) suggests that trust facilitates the exchange of goods and services and allows individuals to access valuable resources and networks. These scholars' findings support the notion that trust is a vital component of social capital, as it enables individuals to establish and maintain relationships based on cooperation, mutual respect, and reciprocity.

Kamau and Mwangi (2011) illustrate this through a case study of the Rotating Savings and Credit Association (ROSCA). In many African countries, ROSCAs are a common form of informal financial institution. These groups consist of individuals who pool their resources together and take turns making withdrawals, in South Africa these are commonly known as stokvels. In a study conducted in Kenya, researchers found that ROSCAs were highly successful because they were built on a foundation of trust. Members trusted each other to make their contributions on time and to make withdrawals fairly. This trust was fostered by

social norms and sanctions, such as gossip and ostracism, which discouraged members from defaulting on their contributions (Kamau & Mwangi, 2011).

Research has also demonstrated that individuals with high levels of social capital, characterized by trust and cooperation, tend to exhibit better mental health outcomes (Kawachi et al., 2004). For instance, a study by Holt-Lunstad et al. (2015) found that individuals with strong social connections and trust in their community reported lower levels of depression and anxiety. Moreover, the lack of trust can have negative consequences for mental health, as individuals who experience social isolation and disconnection may be more prone to depression and anxiety (Holt-Lunstad et al., 2015).

In the context of developing country like South Africa, the relationship between trust and mental health can be more nuanced. Research by Adjaye-Gbewonyo et al. (2018) suggests that trust may not always have a positive impact on depressive symptoms. Instead, its effects are influenced by the context. In the South African context, where social trust is generally low, a high tendency to trust others could actually be linked to more severe depressive symptoms in certain situations. They proceeded to test trust at the district level, and found that individuals whose levels of trust are better aligned with those of their community experience better mental health outcomes. This alignment fosters a sense of belonging and social cohesion, which is particularly important in contexts where social networks can significantly influence well-being. Overall, the evidence suggests that trust is a crucial component of social capital and plays a critical role in shaping individuals' mental health outcomes, particularly when trust aligns with the collective trust of the community (Adjaye-Gbewonyo et al., 2018).

2.5 The relationship between social capital and mental health

The relationship between social capital and mental health has evolved significantly over the past few decades, gaining attention in both developed and developing countries. Theoretical models such as social support theory, social networks analysis (Berkman & Syme, 1979) and the attachment theory (Cohen & McKay, 1984) illustrate how social capital acts as a protective factor, while social cohesion theory, and social identity theory (Wilkinson & Pickett, 2009) highlights the importance of belonging and community dynamics in promoting mental health. In South Africa, where social networks can reflect broader socioeconomic disparities, these models offer valuable insights into the interplay between social capital and mental health outcomes.

2.5.1 Theoretical models

The exploration of the relationship between social capital and mental health has been significantly informed by various theoretical models, each contributing to our understanding of this dynamic. The social support theory posits that social capital provides essential emotional, informational, and practical support, acting as a protective factor against stress and enhancing overall well-being (Cohen & Wills, 1985). Concurrently, the social cohesion theory emphasizes the role of community dynamics, suggesting that strong social ties and a sense of belonging foster feelings of safety and trust, ultimately leading to lower rates of mental health disorders (Wilkinson & Pickett, 2009). The social identity theory further complements these perspectives by asserting that individuals derive a significant portion of their identity from their social groups; belonging to supportive networks can enhance self-concept and resilience, which are crucial for mental health (Wilkinson & Pickett, 2009).

Additionally, the social network analysis provides a framework for examining the structural qualities of social relationships, revealing that dense and supportive networks correlate with improved mental health outcomes compared to isolated or weak connections (Borgatti & Foster, 2003). Lastly, the attachment theory highlights the significance of emotional bonds formed in relationships, positing that secure attachments fostered by strong social ties can mitigate mental health challenges (Bowlby, 1969). Historically, scholars have recognized these models in both developed and developing countries, where social capital manifests distinctly within varying socioeconomic contexts. This progression illustrates a growing acknowledgment of the multifaceted ways social capital influences mental health.

The theoretical models of social support, social cohesion, social identity, social networks, and attachment hold significant relevance in the South African context, particularly in explaining how social capital influences mental health across diverse communities. Research indicates that South Africans often exhibit a preference to remain within their communities, perceived as safe havens for social interaction and support (Somefun et al., 2021). This preference is particularly significant in racially and socioeconomically diverse neighbourhoods, where social connections serve as important buffers against psychological distress stemming from historical and ongoing inequalities (Somefun et al., 2021). Moreover, trust in neighbours is vital in South Africa, where the legacies of apartheid continue to shape social interactions (Posel & Hinks, 2011). Posel and Hinks (2011) illustrates how varying degrees of trust in neighbours and

strangers impact community cohesion, influencing mental health outcomes. This trust is crucial in fostering communal ties that enhance social support systems.

Religious activities have also been identified as essential in strengthening social bonds among community members. Tomita and Ramlall (2021) found that religious involvement serves as a spiritual outlet and provides social support, mitigating depression and fostering a positive self-concept. Participation in these activities significantly contributes to mental health as an integral form of social capital in South Africa (Tomita and Ramlall, 2021). Additionally, the interplay between neighbourhood social capital and mental health is evident in findings by Tomita and Burns (2021), who reported that robust social networks correlate with lower levels of depression among residents. Furthermore, fostering trust between neighbours can lead to the formation of secure attachments within communities, suggesting that initiatives aimed at enhancing trust and promoting social capital can positively influence mental health outcomes, especially in historically fragmented populations. These theoretical frameworks highlight the intricate ways in which social capital, defined by aspects such as a preference to stay in the neighbourhood, the importance of religious activities, and the trust placed in neighbours and strangers, interacts with mental health in the South African context.

2.5.2 Gendered perspectives

The relationship between social capital and mental health is significant by gender, highlighting how social dynamics and mental health can differ for men and women (Berkman & Glass, 2000; Rosenfield, 1999). In a study conducted in a marginalized community in Gauteng highlights that African men and woman utilize social capital as a strategy for survival and future improvement (Myroniuk, 2016). This study illustrates how social capital is gendered, revealing that compared to men, women often engage in communal activities through groups such as church congregations, stokvels, and various informal associations. These networks enhance women's social capital and foster a sense of community connection, supporting livelihoods and alleviating poverty. In contrast, cultural expectations placed upon men frequently emphasize self-reliance, which restricts their ability to access similar forms of social capital (Myroniuk, 2016). This detachment from the community, driven by norms that prioritize individualism, leads to fewer opportunities for emotional and practical support, significantly impacting men's mental well-being and community engagement (Mohnen et al., 2010).

The preference to stay in the neighbourhood, trust in neighbours, and active participation in religious activities become critical in assessing the role of social capital in mental health

(Tomita and Ramlall, 2021). Studies show that social trust, particularly trust in neighbours, is positively correlated with depression (Adjaye-Gbewonyo et al., 2018) as individuals with stronger neighbourhood ties report lower levels of anxiety and depression. With women more likely to trust close friends and family, deriving support from their inner circles (Adjaye-Gbewonyo et al., 2018). However, experiences of gender-based violence and discrimination can hinder women's trust in broader community contexts, resulting in social isolation and negative mental health outcomes (Mohnen et al., 2010). Men, on the other hand, might demonstrate higher levels of trust in professional or institutional settings; however, societal expectations can hinder their vulnerability and ability to seek support, greatly affecting their mental health (Mohnen et al., 2010).

2.6 Empirical literature

Empirical studies have explored how socioeconomic factors, gender dynamics, and social capital influence mental health (Cohen & Wills, 1985; Nolen-Hoeksema, 1991; Berkman & Glass, 2000). Drawing on both international and South African research, this empirical review first examines how factors like income, education, and employment affect mental health, highlighting disparities linked to socioeconomic status. It then discusses gender differences in mental health, shaped by societal norms, and the role of social capital, including community networks and support. Lastly, it explores gender variations in these relationships. The review summarizes key studies in Table 2.1, offering an overview of the research in this field.

Table 2. 1: Empirical studies on socioeconomic variables and mental health.

Study, year	Design	Scale	Analytical Model	Socioeconomic indicator/index	Country
Studies on socioeconomic factors associated with mental health					
International studies					
Ross (2000)	Cross sectional	CES-D Scale[1]	Pooled OLS	Deprivation	United States
Rasul et al. (2001)	Cross sectional	GHQ	Logit	Deprivation	United Kingdom
Yen and Kaplan (1999)	Longitudinal	CES-D Scale	Fixed effects	Poverty	United States
Driessen et al., (1998)	Longitudinal	DIS	Fixed effects	Deprivation	Netherlands
South African studies					
Williams et al. (2015)	Cross-sectional	HADS	Not Specified	Income levels	South Africa
Peltzer et al. (2014)	Longitudinal	K10	Fixed effect	Employment status	South Africa
Stein et al. (2012)	Cross-sectional	GHQ	Logit	Not Specified	South Africa
Kagee et al. (2010)	Longitudinal	CIDI	Not specified	Household income	South Africa

[1] CIDI: Composite International Diagnostic Interview. DIS: Diagnostic Interview Schedule. HADS: Hospital Anxiety and Depression Scale. K10: Kessler Psychological Distress Scale. GHQ: General Health Questionnaire. PHQ-9: Patient Health Questionnaire. CES-D scale: Centre for Epidemiologic Studies Depression Scale

Study, year	Design	Scale	Analytical Model	Socioeconomic indicator/index	Country
Studies on the gender gap in mental health					
International studies					
Paton et al. (2016)	Cross sectional	PHQ-9	Linear regression	Not Specified	United States
Kinnunen et al. 92019)	longitudinal	Not Specified	Hierarchical linear modelling	Not Specified	United States
Schneider et al. (2022)	longitudinal	PHQ-9	Multivariate regression	Not Specified	South Africa
Peltzer et al. (2018)	Cross-sectional	Not specified	logistic regression	Neighborhood crime	South Africa
Studies on the relationship between social capital and mental health					
International studies					
Bowers et al. (2019)	Cross-sectional	SDQ	Regression Analysis	Social Capital	United States
Berkman et al. (2020)	Longitudinal	GHQ	SEM	Social Networks	United Kingdom
South African studies					
Tomita & Burns (2013)	Cross-sectional	Depression scale	Multilevel Analysis	Not Specified	South Africa

Study, year	Design	Scale	Analytical Model	Socioeconomic indicator/index	Country
Somefun et al. (2008)	Cross-sectional	Depression Symptoms	Logistic Regression	Not Specified	South Africa
Lau and Ataguba, (2015)	Cross-sectional	Self-rated Health	Multilevel Modelling	Individual-level social capital	South Africa
Adjaye-Gbewonyo et al. (2018)	longitudinal	CES-D 10	Fixed Effects	Not Specified	South Africa
Studies on gender differences in the relationship between social capital and mental health					
International studies					
Poortinga (2006)	Quantitative	Not specified	Multilevel Modelling	Social Capital	United States
Morgan and Wiles (2019)	Repeated Cross-sectional	Anxiety and Depression	Regression Analysis	Informal Support, Formal Networks,	United Kingdom
South African studies					
Myroniuk (2016)	Qualitative	Thematic Analysis	Thematic Analysis	Bonding vs. Bridging	South Africa
Chola and Alaba (2018)	Quantitative	Depression Scale	Multilevel Model	Not specified	South Africa

2.6.1 Socioeconomic factors associated with mental health

Key socioeconomic status (SES) variables that have emerged in the literature include education, employment status, income, see table 2.1 for listed studies. Ross (2000) employed the CES-D Scale within a cross-sectional design, utilizing pooled Ordinary Least Squares (OLS) regression to investigate depressive symptoms influenced by deprivation at the census tract level in the United States. In their study they demonstrated that higher educational attainment correlates with lower incidences of depression and anxiety disorders. Their findings suggest that individuals with higher education tend to have better mental health outcomes and improved access to mental health resources. Similarly, Rasul et al. (2001) used logistic regression to analyse General Health Questionnaire (GHQ) data, examining the odds of poor mental health linked to deprivation in the United Kingdom, which further emphasised the correlation between socioeconomic factors and mental health.

Yen and Kaplan (1999), taking a longitudinal approach, employed fixed-effects models to explore how long-term exposure to poverty affects mental health across multiple census tracts in the United States. They revealed that individuals with tertiary education experience a 30% lower likelihood of depressive symptoms compared to those with only primary education, emphasizing the role of education in relieving poverty and enhancing mental well-being. In the Netherlands, Driessen et al. (1998) utilized similar fixed-effects models with the Diagnostic Interview Schedule (DIS) to demonstrate consistent associations between neighbourhood deprivation and mental health outcomes, they found that the unemployed face a 40% higher risk of poor mental health outcomes compared to their employed counterparts.

Across these studies, a common theme emerges where lower SES measured through income, education, or employment correlates with higher rates of mental health issues. The studies collectively suggest that social and environmental factors significantly impact these outcomes, although most do not explicitly focus on gendered analysis. The methodologies employed consistently accounted for variables such as income, education level, and employment status, framing mental health within the context of socioeconomic disadvantage (Ross, 2000; Rasul et al., 2001; Yen & Kaplan, 1999; Driessen et al., 1998).

In South Africa, the interaction between socioeconomic factors and mental health is particularly complex due to the country's historical context of inequality and socio-economic disparities. Williams et al. (2015) conducted a cross-sectional analysis using the Hospital

Anxiety and Depression Scale (HADS) to explore the relationship between income levels and mental health outcomes across urban and rural sites in South Africa. Their findings indicated a significant correlation between lower income levels and increased symptoms of depression, highlighting how economic hardship can adversely affect mental well-being. In a longitudinal study, Peltzer et al. (2014) employed the Kessler Psychological Distress Scale (K10) to assess the mental health impacts of employment status on a national scale in South Africa. Their analysis revealed a clear linkage between unemployment and elevated psychological distress, suggesting that stable employment serves as a protective factor for mental health.

Stein et al. (2012) utilized the General Health Questionnaire (GHQ) in a cross-sectional design to examine the influence of socioeconomic status on mental health in Johannesburg. Their study demonstrated a strong relationship between lower socioeconomic status and higher rates of mental health issues, reinforcing the idea that social determinants significantly shape mental health trajectories. Kagee et al. (2010) provided further insight through a longitudinal investigation that employed the Composite International Diagnostic Interview (CIDI) to explore how household income impacts mental health outcomes in Cape Town. Their research revealed that households with lower income levels faced increased risks of mental disorders, suggesting that financial stability is crucial for psychological well-being.

The common theme across these South African studies is the significant impact of socioeconomic factors, particularly income and employment status on mental health outcomes. Each study highlights how economic hardship, whether through low income or unemployment, correlates with increased mental distress, thereby emphasizing the importance of addressing socioeconomic inequalities to improve mental health (Williams et al., 2015; Peltzer et al., 2014; Stein et al., 2012; Kagee et al., 2010). Despite their contributions, a notable knowledge gap remains in these studies, as none have conducted a gender analysis to examine how these socioeconomic factors may affect mental health differently across genders. This study aims to address this gap by investigating how gender intersects with social capital in influencing mental health outcomes.

2.6.2 Studies on the gender gap in mental health

The gender gap in mental health is explained by many variables, such as household dynamics (the number of children in the household, household expenditure, and household income), social environments (neighbourhood crime and violence, social trust and networks), and economic factors (education, employment status, and household expenditure) (Murray, 2021).

A cross-sectional analysis by. Paton et al. (2016) employed a cross-sectional design to investigate the relationship between gender, social support, and mental health outcomes among a sample of 1,500 adults in the United States. The study found that women reported higher social support but also higher depression symptoms than men, with women's social support networks characterized by more emotional support and men's networks focused on practical assistance. The emotional labor involved can lead to increased stress and depression. Similarly, Kinnunen et al. (2019) conducted a longitudinal study employing linear regression models examining gender differences in depression and anxiety symptoms among a sample of 1,000 adults in the United States over a period of three years. The study found that women reported higher levels of depression symptoms compared to men, particularly during periods of unemployment or reduced work hours, and that women's mental health outcomes were significantly improved when they reported having stable employment (Kinnunen et al. 2019).

Studies have also targeted social environments; for instance, a longitudinal study by Goyal et al. (2021) utilized hierarchical linear modelling to assess how neighbourhood crime and violence impacted women's mental health, concluding that higher crime rates were linked to increased anxiety and depressive symptoms, with social trust serving as a protective factor. Common themes emerging from these studies suggest that economic stability signalled by household income and employment status, coupled with supportive social networks, significantly influence women's mental health outcomes. The intersectionality of gender roles within household dynamics further complicates these issues, as women often bear a lot of the caregiving responsibilities, leading to increased emotional labour and stress (Murray, 2021; Patton et al., 2016).

In South Africa, the gender gap in mental health is shaped by distinctive historical, cultural, and socio-economic influences. Schneider et al. (2022) utilized multivariate regression models to analyse the impact of household income and expenditure on mental health outcomes among South African women. They found that higher household income was significantly associated with lower rates of depression and anxiety among women. Furthermore, the number of children in the household was linked to increased stress levels, particularly among single mothers, this was found by Mathews & Benatar's (2021) study which focused on single mothers, using a mixed-methods approach to examine the influence of household dynamics on mental health outcomes. The results showed that single mothers who reported higher levels of household stress and financial strain experienced worse mental health outcomes (Mathews & Benatar, 2021).

Their findings indicated that South African women often face heightened mental health challenges, particularly in regions marked by high unemployment and limited access to educational resources. In contrast, men's mental health challenges are often shaped by socio-economic pressures, such as unemployment and societal expectations to be providers (Katz et al., 2020). Social environments also play a critical role; the work of Peltzer et al. (2018) employed logistic regression to demonstrate that exposure to neighbourhood crime and violence contributed to elevated mental health issues among women while highlighting the protective influence of social trust and community networks. The study indicated that women with stronger social ties reported better mental health outcomes, reinforcing the importance of social capital. Common themes across these studies' emphasis that economic stability, supportive social networks, and the challenges of household responsibilities significantly shape women's mental health experiences in South Africa (Jewkes et al., 2018).

2.6.3 Studies on the relationship between social capital and mental health

Western nations reveal a positive correlation between community engagement and lower rates of depression and anxiety (Putnam, 2000; Kawachi & Berkman, 2000). In a study conducted in the United States, by Bowers et al. (2019) examined the interplay between social capital and mental health, focusing on adolescent populations. The methodology involves a cross-sectional survey design, utilizing a sample of 1,500 adolescents from various socio-economic backgrounds. Key variables include measures of social capital (both bonding and bridging), social support, and mental health outcomes assessed through standardized scales such as the Strengths and Difficulties Questionnaire (SDQ). The research employs regression analysis to explore the relationships between social capital dimensions and mental health indicators. Results indicate that higher levels of both bonding and bridging social capital correlate with lower levels of mental health distress, with bonding social capital providing essential emotional and psychological support, particularly for girls, who tend to report higher levels of mental distress compared to boys (Bowers et al., 2019). The gender analysis reveals that while both boys and girls benefit from social capital, the qualitative aspects of their experiences differ; bonding social capital is more critical for girls, enhancing their emotional resilience, while boys gain from bridging social capital through increased networking opportunities (Bowers et al., 2019).

Similarly, a study in the United Kingdom, Berkman et al. (2020) further investigates the relationship between social capital and mental health, employing a longitudinal approach using

data from the Understanding Society survey. This research examines a diverse cohort, focusing on social capital dimensions such as community engagement and social networks. Methodologically, the study utilizes Structural Equation Modelling (SEM) to analyse the complex relationships between social capital, social support, and mental health outcomes, particularly anxiety and depression (Berkman et al., 2020). Key variables in this study include individual-level social capital measures, demographic characteristics, and mental health scales like the General Health Questionnaire (GHQ). The findings emphasize that women benefit significantly from community engagement, which enhances their mental well-being, while men show a stronger correlation between social capital and mental health outcomes when considering social networks. Gender analysis in this study reveals that women's mental health is more closely tied to the quality of their social connections, whereas men's mental health benefits more significantly from the breadth of their networks (Berkman et al., 2020).

Understanding the relationship between social capital and mental health in South Africa has utilized various methodological approaches. One notable study by Tomita and Burns (2018), employed a multilevel analytical framework to assess how neighbourhood-level social capital influences individual-level depression. This study utilized a representative sample drawn from the South African National Income Dynamics Study, employing hierarchical linear modelling to analyse the data. Social capital variables explored included measures of community trust, social cohesion, participation in local organizations, and the perception of neighbourhood safety. The dependent variable for depression was measured using a validated depression scale, allowing for a nuanced understanding of how neighbourhood dynamics correlate with mental health outcomes (Tomita and Burns, 2018). The study by found that higher levels of community trust and social cohesion at the neighbourhood level were associated with lower levels of depression at the individual level, while participation in local organizations and perceived neighbourhood safety had a positive and negative effect, respectively (Tomita and Burns, 2018).

In another study by Somefun and Fotso (2020) focused on the youth population, analysing how both family and neighbourhood social capital impact mental health outcomes. Using a cross-sectional survey design, this research incorporated variables such as family support, peer relationships, and community engagement as components of social capital. The mental health outcomes were assessed through self-reported measures of psychological distress, highlighting the importance of both familial and community networks in youth well-being. The study found that both family and neighbourhood social capital positively impacted mental health outcomes

in youth, with higher levels of family support and parental involvement, and community engagement and peer relationships, associated with lower levels of psychological distress (Somefun and Fotso, 2020).

Myer et al. (2008) further contributed to the understanding of social determinants of psychological distress in a nationally representative sample of South African adults. This study employed logistic regression models to identify the impact of various social capital indicators such as social support, community participation, and perceived social isolation on depression outcomes, specifically focusing on depression symptoms. Their findings revealed that social capital significantly influences mental health, indicating that individuals with higher levels of community engagement and social support reported lower rates of psychological distress (Myer et al. 2008).

The results across these studies consistently suggest that social capital is a critical determinant of mental health in South Africa, with both community and familial constructs significantly linked to reducing depressive symptoms. Higher neighbourhood social capital has been associated with lower levels of depression (Tomita & Burns, 2018), while family support networks can serve as a protective factor for youth mental health (Somefun et al., 2020). Furthermore, access to social capital appears to mitigate depression among adults (Myer et al., 2008), reinforcing the idea that strengthening social ties and community networks could potentially enhance mental health outcomes across various demographics in the South African context.

2.6.4 Gender differences in the relationship between social capital and mental health

The benefits from social capital accumulation differ between men and women, in the United States, Poortinga (2006) investigates how social capital influences mental health differently for men and women across various Western countries. The research employs a quantitative methodology, utilizing data from the World Health Organization's world health survey, which includes a representative sample from multiple countries. Key variables examined include the level of social capital (measured through social networks, trust in community members, and civic engagement) and mental health outcomes (assessed through standardized measures of depression and life satisfaction). The analysis incorporates multilevel modelling to account for individual and country-level variations. Results highlight that women benefit more from social capital in terms of mental health, as higher levels of trust and social connections significantly

reduce their depressive symptoms (Poortinga, 2006). In contrast, men show less pronounced benefits from social capital, which suggests that traditional masculine norms may inhibit emotional expression and reliance on social networks, ultimately impacting mental health negatively (Poortinga, 2006).

Building on this, the Morgan and Wiles (2019) study also explores the role of different forms of social capital, such as social networks, trust, and civic engagement, and how these factors affect mental health outcomes differently for men and women. This research utilizes repeated cross-sectional survey data collected by a national UK social survey. Key variables include dimensions of social capital (such as informal support, formal networks, and community involvement) and psychological well-being indicators (measured by anxiety and depression scales). The authors apply regression analyses to identify relationships between these variables while controlling for socio-economic factors and demographic characteristics. Results reveal that women derive greater psychological benefits from social capital, notably from informal support networks, which enhance their overall well-being (Morgan and Wiles, 2019). Conversely, men's psychological well-being appears to be less sensitive to variations in social capital, reinforcing the notion that social expectations around masculinity may lead to less engagement in social networks considered beneficial for mental health. Both studies highlight common themes regarding the differential effects of social capital on mental health outcomes across genders. Women typically leverage social capital for emotional support, significantly improving their mental health. In contrast, men's well-being is seemingly less affected by social connections, potentially due to gendered norms that discourage vulnerability and reliance on social support (Morgan and Wiles, 2019)

These insights on gendered differences in social capital and mental health outcomes can also be applied to the South African context, as illustrated by Myroniuk's (2016) study in a Johannesburg township, which explores how cultural and socio-economic factors shape these dynamics. The study focuses on bonding versus bridging social capital and highlights how cultural and socio-economic factors shape these dynamics within a township setting. Methodologically, the research employs qualitative interviews and focus group discussions to gain insights into individuals' experiences and perspectives on social networks and mental health. Analytical frameworks include thematic analysis to identify patterns in how respondents discuss their social capital experiences and the impact on their mental health. Results indicate that women in the township often engage more in bonding social capital, which provides crucial

emotional support, while men may rely more on bridging social capital for economic opportunities (Myroniuk, 2016). These gendered patterns significantly influence their respective mental health outcomes, with women's stronger bonding capital correlating positively with lower levels of depression, whereas men's mental health may suffer due to the pressures of economic contributions tied to bridging capital (Mbokazi, 2022).

2.7 Conclusion

The studies reviewed in this chapter provide a comprehensive look at the different theoretical perspectives that attempt to explain why women are more likely to experience depressive symptoms than men. The biomedical theory suggests that genetic and hormonal factors play a role in women's higher rates of depression (Nolen-Hoeksema, 1987; Hammarström et al., 2009). The theory provides valuable insights into the complex interplay of biological factors that contribute to gender differences in mental health outcomes. By understanding these factors, mental health professionals can develop more targeted and effective interventions to address the unique needs of women who are at a higher risk for depression. Additionally, policymakers and researchers can use this information to inform policies and programs aimed at promoting women's mental health and well-being.

The reviewed studies have shown that the gender gap in depression is a prevalent issue that extends across different regions and economies. Studies conducted in various countries, such as the work by Bourdieu (1984), Coleman (1988), Putnam (2000), Lin (2000), and Kawachi and Berkman (2000), have consistently reported higher rates of depression among women compared to men. Furthermore, longitudinal studies, such as those conducted by Abrams and Mehta (2019) and Platt et al. (2020), indicate that the gender disparity in depression may diminish as individuals grow older. In developed nations, factors like education levels, social determinants, and birth cohort membership have been identified as significant predictors of the gender gap in depression (Brault et al., 2012). However, in South Africa, limited research has explored the gender gap in mental health. Cross-sectional data from studies conducted in the region, including those by Mutyambizi et al. (2019) and Mungai & Bayat (2019), consistently show higher depression scores among women. Despite this, there is a lack of longitudinal research examining how the gender gap in depression evolves with age, and the socio-economic factors contributing to this disparity are not well understood. Consequently, further investigations are needed to address these knowledge gaps.

While previous studies have shed light on the importance of social capital in mitigating depressive symptoms, significant gaps in the literature remain. Specifically, the current research has identified a need for a more nuanced understanding of how social capital impacts mental health outcomes differently for men and women in South Africa. In this context, social capital emerges as not only a crucial factor in shaping mental health but also an essential resource for survival and well-being in materially deprived communities, such as many found in South Africa. The potential for social capital to alleviate the effects of economic and social hardship, provide emotional support, and strengthen community bonds is especially critical in settings where access to formal mental health resources may be limited.

The proposed study aims to fill this knowledge gap by analyzing the 5 waves of the National Income Dynamics Study (NIDS) dataset, which provides a unique opportunity to explore the dynamic relationships between social capital and mental health outcomes over time. To address the research questions of this study, Chapter 3 will provide an in-depth analysis of the descriptive statistics of the sample, while Chapter 4 will employ econometric models to examine the gender distinct relationships between different facets of social capital, mental health, and other key variables. By combining these approaches, this study aims to provide a comprehensive understanding of how social capital shapes mental health outcomes for men and women in South Africa. Ultimately, the findings will emphasize that social capital is not only vital for improving mental health but also essential for the resilience and survival of individuals in socioeconomically disadvantaged communities.

Chapter 3: Data and descriptive statistics

This chapter introduces the data that are used for the empirical analysis and presents descriptive statistics on the sample of interest, which will provide a descriptive overview of social capital and mental health. This study addresses a research gap in South Africa's longitudinal studies, which typically examine only 2-3 waves of the National Income Dynamics Study (NIDS). By utilizing all 5 waves, the study will explore the long-term effects of social capital on mental health, enhancing understanding of their complex interplay with demographic factors. The use of waves 1 to 5 of the National Income Dynamics Study (NIDS) provides several advantages in analysing the relationship between social capital and depression. Firstly, utilizing multiple waves increases the sample size and enhances statistical power. A larger sample reduces the likelihood of spurious relationships and improves the robustness of the results. Secondly, tracking depression and social capital over time allows for a dynamic analysis of these variables, rather than relying solely on cross-sectional associations. Longitudinal data help establish temporal relationships, making it possible to assess how changes in the relationship between social capital and mental health outcomes evolve over time.

Thirdly, a panel dataset like NIDS is well-suited for addressing unobserved heterogeneity, individual differences that are not directly measured but could affect both social capital and depression. By following the same individuals across multiple waves, fixed-effects models can be employed to control for time-invariant individual characteristics, such as personality traits or genetic predispositions, that may confound the relationship between social capital and mental health. Additionally, using all five waves allows for the examination of long-term trends and stability in social capital measures. Short-term fluctuations may not fully capture the broader impact of social capital on depression, whereas a multi-wave analysis provides a more comprehensive picture of these relationships. This approach strengthens the validity of the study and provides a more holistic understanding of how social capital evolves and interacts with mental health over time. The research will also address critiques regarding gender nuances and racial economic disadvantage among the majority African population, comprising 92.5 percent of South Africa (Stats SA, 2020).

Section 3.1 details the data and sample from the National Income Dynamics Study (NIDS) chosen for the analysis. Section 3.2 describes the specific variables used to measure depression (dependent variable), social capital (independent variable), and other factors, while section 3.3

presents descriptive statistics for the sample, categorized by gender, age, and other characteristics. Additionally, this section explores the distribution of depression, and its relationship with key covariates, using kernel density plots. Finally, Section 3.4 presents summary measures of changes in individuals' mental health over time, including transition matrices, and Section 3.5 concludes.

3.1 Data and sample

The analysis in this study is based on data from the NIDS, a nationally representative, publicly available household longitudinal survey conducted by the Southern Africa Labour and Development Research Unit (SALDRU). This dataset maps out and creates records of economic and social dynamics in South Africa, capturing these developments over a period of 10 years. The dataset is a panel or time series cross-section dataset, which captures the transitions in economic and social activity from the population of South Africa at multiple points in time. Data are collected from a nationally representative sample of 7300 households that are economically and socially unique from each other, comprising of a total of 28 226 residents in the first wave (NIDS, 2015). The NIDS panel tracked the same individuals from the year 2008, with the five waves of data collected approximately every two years in 2008/2009, 2010/2011, 2012, 2014/2015, and 2017/2018 (NIDS, 2015).

The data recorded in the NIDS study comprise not only of poverty and inequality statistics, but it also captures education, health, income, labour market participation, migration, fertility, household composition, well-being, and social capital (NIDS, 2015). The empirical analysis of this study is based on all the five waves of NIDS. The sample used for this study comprises only African individuals that are 15 years of age and older, which is about 79 % of the South African population as per the NIDS sample. Previous research has highlighted significant disparities in mental health outcomes across different racial and ethnic groups in South Africa (Karam et al., 2015). Focusing on African individuals specifically allows this study to address the unique socio-cultural contexts and historical factors that may influence the relationship between social capital and mental health within this demographic, without needing to control for inequalities across race groups.

The first wave of the NIDS sample has 22 206 Africans - out of 28 226 of the total sample. Only 9.6 % of African women with complete information did not appear in the subsequent waves, while almost 85 % appeared in at least three waves (Posel and Bruce-Brand, 2020). Among African men, 7.2 % did not appear in subsequent waves, and a significant majority of

74% appeared in at least three waves (Posel and Bruce-Brand, 2020). In defining the sample, it is important to clarify that the analysis does not use a balanced panel. Individuals are required to be observed in at least two waves to be included in the panel analysis, but they are not required to appear in every wave. The data used reflects individuals' responses in the waves where they participated, rather than restricting the sample to those who completed all waves. Using an unbalanced panel helps mitigate attrition bias, which is a common limitation of balanced panels. A stricter balanced panel approach would exclude a greater number of individuals who may have valid observations in multiple waves, thereby reducing the representativeness of the sample. Therefore, as much as the sample is reduced by considering only the African race group, this population maintains a sufficient sample size with minimal dropout, making it adequate for this study's analysis. Weights have been applied throughout the analysis of this study to correct for non-random attrition in the panel; therefore, the estimates are representative of the South African population of African adults.

3.2 Measures

This section provides an overview of the measures used in the analysis, including the variables employed to assess depression and social capital, and the control variables, which comprise demographic and socioeconomic factors included in the regression model. Many studies that use survey data to investigate mental health use the 10-item Centre for Epidemiological studies Depression Scale (CES-D-10) to measure mental health or depression (Radloff, 1977). Studies that use the CES-D-10 depression score in the South African context include Tomita and Burns (2013), Tomita and Burns (2015), Somefun and Fatso (2020), and Dowdell et al., (2020). The CES-D-10 depression scale can be used as a continuous measure for depression or categorised as a binary variable, but much of this choice depends on the model to be used in estimating the results and the manner of investigation. Most South African studies have used the mental health variable as a continuous depression score ranging from (0-30), but Baron et al. (2017) treated the mental health variable as binary.

3.2.1 Dependent Variable: Depression

The NIDS questionnaire utilised the CES-D10 scale developed by Dr Lenore Radloff in 1977. The questions are designed to assess depression symptoms in the general population by conceptualizing depression as a continuum rather than a binary. Out of ten questions, two focus on positive emotions and eight on negative emotions, with responses ranging from the emotion being rarely or never experienced during the past week to being experienced all the time.

Positive emotion responses are re-coded in reverse to align with negative emotion responses, and the individual emotion responses are summed, resulting in a score where zero indicates no depressive symptoms and thirty indicates the highest level of depression. In this study, a binary measure of depression is also created, by using a cut-off point of 12 on the depression score, derived from research demonstrating its effectiveness in classifying depression levels within the Zulu, Xhosa and Afrikaans speaking population. According to Baron et al. (2017), a cut-off score of 12 for the Zulu sample on the CES-D-10 provides a balanced sensitivity (71.4%) and specificity (72.6%), accurately classifying 72.6% of participants. This cut-off is utilized in this study to ensure relevance and accuracy in measuring depression among the African population (Baron et al., 2017). The selection of this threshold is well-supported by the literature, particularly for African language speakers, making it the most appropriate cut-off point for this analysis. While alternative cut-off points have been suggested in other studies, the choice of 12 aligns with the validated approach for this population.

3.2.2 Explanatory Variable: Social capital

The key independent variable of interest is social capital. As explained in Chapter 2, different proxies for social capital are used in the literature because it is complex to define and measure. Studies conducted outside of South Africa typically incorporate only one aspect of social capital (Campbell et al., 2002; Gregson et al., 2004; Maltitz, 2005). This is problematic for in capturing the broader concept of social capital and how it affects mental health. The five South African studies evaluated in Chapter 2 incorporated three aspects of social capital, namely social cohesion, social participation, and social trust (Lau and Ataguba, 2015; Somefun and Fatso, 2020; Tomita and Burns, 2013; Chola and Alaba, 2018 and Adjaye-Gbewonyo et al., 2018). Therefore, this study will do the same. Social capital can be measured at different levels, particularly at the individual level and also at the neighbourhood level. The SA studies all included some aspects of both individual and neighbourhood level social capital factors, and this study will follow suit.

This study uses multiple variables to measure the three key aspects of social capital. Social cohesion is measured using two variables. First, location preference is derived from question M1 (“How strong is your preference to continue living in this area?”). This variable measures an individual's sense of belonging and attachment to their community (NIDS, 2015). The second aspect of cohesion is neighbourhood safety, which is a composite measure incorporating crime and violence. NIDS asked somewhat different questions about these aspects in waves

one and two from those asked in waves three to five, requiring similar information to be joined to obtain variables that are observed throughout the waves.[2] Neighbourhood safety is measured as a four-category variable indicating whether crime and violence are low or high (NIDS, 2015).

Social participation is measured by the importance of religious activities, derived from question M7 ("How important are religious activities in your life?"). This variable measures social capital by assessing an individual's level of participation and engagement in religious activities, which are often deeply ingrained in community and social norms. When individuals prioritize religious activities, they are more likely to engage with like-minded people, build social connections, and develop a sense of belonging and trust within their community. The importance of religious activities is a four-category variable, rated from not important to very important (NIDS, 2015).

Question M9, asking about whether individuals belong to a range of social groups, was not used in this analysis because it was only available in waves 1 and 2 of the NIDS dataset, whereas this study aimed to assess social participation consistently over all five waves. The limited availability of M9 would have led to inconsistencies in measurement and made it difficult to track changes in social participation over time. Using a variable that is not present across all waves would limit comparability and reduce the robustness of the findings. Therefore, despite its potential strength as a measure of social capital, its exclusion was necessary to ensure consistency and reliability in the analysis.

Importance of religious activities were chosen as a measure of social participation due to their strong association with social capital in prior literature (Beukes, 2024). Participation in religious activities has been widely recognized as a key indicator of social engagement, as it fosters interactions, builds trust, and strengthens community ties. Studies have shown that religious involvement often leads to broader social connections and active participation in civic life, making it a meaningful proxy for social participation. Unlike M9, question M7 was consistently included across all five waves of NIDS, allowing for a longitudinal analysis of

[2] The measure for crime was generated using questions D33.4 in waves 1-2 ("How common is burglary and theft in your neighbourhood?") and D41.1 in waves 3-5 ("How common are burglaries, muggings, or thefts in your neighbourhood?"). The measure for aggression and violence was generated using questions D33.3 in waves 1-2 ("How common is it that people in your neighbourhood are aggressive?) and D41.3 in waves 3-5 ("How common is there violence between members of different households in your neighbourhood?"). Respondents rated all questions on a five-point scale, from never happens to very common.

social participation trends over time. This consistency ensured that findings were comparable and could provide meaningful insights into the role of social capital in mental health outcomes.

The third aspect of social capital is social trust, which is assessed at both the individual and district levels, following the framework established by Adjaye-Gbewonyo et al. (2018). At the individual level, personalized social trust reflects the trust in those living nearby, while generalized social trust pertains to trust in strangers. To measure each type of social trust, a binary variable is created based on responses to the scenarios involving the likelihood of a lost wallet being returned containing R200, derived from questions M10 and M11. Respondents are categorized as having high trust if they believe it is "Very likely" to have the money returned, while those who respond "Somewhat likely" or "not likely at all" fall into the second category, indicating lower trust levels (NIDS, 2015). At the district level, the percentage of individuals exhibiting high social trust is calculated to provide an overview of community-wide trust dynamics (Adjaye-Gbewonyo et al., 2018).

3.2.3 Control variables:

The models estimated in Chapter 4 include various demographic and socioeconomic variables from the SA-NIDS adult and household questionnaires as control variables. The sample is split by gender to address the research aim of how the relationship of interest differs by gender, and the variable for gender is self-reported and classified as binary. Age is measured in years, and it captures whether mental health becomes better or worse as people age. Marital status is represented as a dummy variable (0 if not married and 1 if married). Self-reported health is categorized into four levels: excellent, very good, good, and fair health status. Employment status is classified into three categories: inactive, unemployed, and employed. The inactive category includes individuals who are not participating in the labor force. The unemployed category consists of individuals who are not currently working but are either actively seeking work or want to work and are available to start. Lastly, the employed category encompasses individuals who are currently working for pay (NIDS, 2015). Education has four categories: primary or no education, secondary, matric, and tertiary education.

The remaining variables capture aspects of the status and behaviour of the household. The geographical area in which the household is located is captured using a dummy variable (0 if rural and 1 if urban). The number of children that an individual is the carer for indicates dependents living in the household that require care. Total household expenditure is expressed

in South African Rands per month and is converted into a per capita variable, using the number of household residents, to serve as a measure of the household's economic status. Finally, the individual's decision-making power within the household is categorized into two binary variables for whether the person is a main or a joint decision-maker, reflecting the dynamics of trust and agency within households.

3.3 Descriptive statistics

Prior to delving deeper into the analysis of the relationship between mental health and social capital, it is crucial to have a general grasp of the nature of the sample. This section displays and discusses descriptive statistics for the sample of African adults who are 15 years of age and older. Table 3.1 below presents pooled mean characteristics for both men and women for all the variables that are used in the analysis of this study. The table highlights gender difference in key variables using a test of equality of means between women and men.

Table 3.1: Descriptive statistics for the analysis sample, by gender

VARIABLES	Men	Women
Depression score CES-D-10	6.999	7.507***
	(0.072)	(0.070)
Depression dummy		
Not depressed	0.853	0.821***
	(0.004)	(0.004)
Depressed	0.147	0.179***
	(0.004)	(0.004)
Location Preference		
Strong preference to leave	0.0649	0.0625***
	(0.003)	(0.003)
Moderate preference to leave	0.0653	0.0605***
	(0.002)	(0.003)
Neutral	0.140	0.123***
	(0.005)	(0.003)
Moderate preference to stay	0.162	0.153***
	(0.004)	(0.004)
Strong preference to stay	0.568	0.601***
	(0.008)	(0.008)
Neighbourhood Safety		
Low crime, low violence	0.602	0.588
	(0.0124)	(0.0124)

VARIABLES	Men	Women
High crime, low violence	0.142	0.158
	(0.006)	(0.006)
Low crime, high violence	0.127	0.119
	(0.005)	(0.004)
High crime, high violence	0.128	0.135
	(0.008)	(0.007)
Importance of religious activities		
Not important	0.0636	0.0200***
	(0.003)	(0.002)
Unimportant	0.0950	0.0338***
	(0.005)	(0.002)
Important	0.456	0.444***
	(0.008)	(0.009)
Very important	0.385	0.503***
	(0.007)	(0.009)
Trust of neighbours (personalized trust)		
Individual level		
Very likely	0.134	0.135
	(0.005)	(0.005)
Somewhat likely or not likely	0.866	0.865
	(0.005)	(0.005)
District level		
%Very likely	14.47	14.57
	(0.285)	(0.291)
Trust of stranger (generalized trust)		
Individual level		
Very likely	0.0690	0.0678
	(0.004)	(0.003)
Somewhat likely or not likely	0.931	0.932
	(0.004)	(0.003)
District level		
%Very likely	6.884	6.881
	(0.191)	(0.174)
Age in years		
Age	34.52	36.71***
	(0.363)	(0.204)
Marital status		
Not married	0.760	0.765
	(0.012)	(0.008)
Married	0.240	0.235
	(0.012)	(0.008)

VARIABLES	Men	Women
Self-reported health status		
Fair	0.0899	0.141***
	(0.003)	(0.003)
Good	0.225	0.261***
	(0.005)	(0.004)
Very good	0.301	0.290***
	(0.005)	(0.005)
Excellent	0.384	0.308***
	(0.007)	(0.006)
Employment status		
Inactive	0.354	0.481***
	(0.011)	(0.009)
Unemployed	0.136	0.175***
	(0.005)	(0.004)
Employed	0.510	0.344***
	(0.014)	(0.008)
Education		
Primary or no education	0.247	0.261
	(0.011)	(0.009)
Incomplete secondary education	0.469	0.462
	(0.011)	(0.0079)
Matric	0.168	0.149
	(0.007)	(0.005)
Tertiary education	0.116	0.128
	(0.007)	(0.007)
Geographical area		
Rural	0.413	0.465***
	(0.032)	(0.032)
Urban	0.587	0.535***
	(0.032)	(0.032)
Childcare		
Number of children being cared for	0.0563	0.898***
	(0.002)	(0.014)
HH-Expenditure		
Household expenditure per capita (R'000s)	1.749	1.120***
	(0.080)	(0.048)
Household main decision making		
Does not make main decisions	0.432	0.407***
	(0.014)	(0.006)
Makes main decisions	0.568	0.593***
	(0.014)	(0.006)
Household joint decision making		

VARIABLES	Men	Women
Does not make joint decisions	0.810	0.710***
	(0.005)	(0.005)
Makes joint decisions	0.190	0.290***
	(0.005)	(0.005)
Observations	121,001	122,863
Sample	22523	31729
Population	46013752	51646893

Source: National Income Dynamics Study 2008, waves 1-5, own calculations.
Notes: The sample includes all African individuals aged 15 and older. All estimates are weighted. Standard errors are shown in parentheses. Stars indicate the level of significance of a test of equality of means between women and men using:
*** p<0.01, ** p<0.05, * p<0.1

The average CES-D-10 depression score for men is 6.999 and for women is 7.507, with the difference being statistically significant at a 1% significance level. This confirms the widespread finding in the literature that on average women have higher depression levels compared to men (Kessler et al., 2003; Sedat et al., 2019; Meyer et al., 2018; Angst et al., 2011). This is not only seen in mental health studies but is a recurring pattern in most health studies where women report poorer health then men. In their study, Chola and Alaba (2013) found that women in South Africa were less likely to report good health compared to men.

For location preference, the majority of individuals have a strong preference to stay in their current neighbourhood. This preference is significantly stronger for women than for men, with 60.1% of women preferring to stay compared to 56.8% of men. Men are slightly more likely to want to leave their neighbourhood than women. Overall, the results suggest that men have a weaker attachment to their current neighbourhood than women do. For the neighbourhood safety variable, the results indicate that men generally perceive safer neighbourhoods (low crime, low violence) compared to women (60.2% men and 58.8% women), while women tend to report higher concerns regarding neighbourhoods characterized by high crime and violence. Notably, 13.5% of women perceive their neighbourhood to be a high crime and high violence area compared to 12.8% men. Importantly, gender differences in reports of neighbourhood safety are not statistically significant, suggesting that men and women perceive their neighbourhoods in similar ways regarding crime and violence.

The next variable is the importance of religious activities, where there are significant gender differences, with women generally placing greater value on religious activities than men. A

smaller proportion of women (2.0%) consider religious activities "not important" compared to men (6.4%), and only 3.4% of women view them as "unimportant," versus 9.5% of men. Furthermore, a higher percentage of women (50.3%) regard religious activities as "very important," compared to 38.5% of men. These findings suggest that women are more likely to engage in and religious activities, which could have implications for their community involvement and mental health support systems.

The results for trust indicate minimal differences between genders. None of these differences are statistically significant, suggesting little variation in trust levels by gender. For trust in neighbours, men and women report nearly identical levels of trust in the 'very likely' category, as well as in the 'somewhat likely or not likely' category. Similarly, for trust in strangers, women show a slightly higher level of trust, but again, the differences are negligible. District-level trust scores for both genders are closely aligned as well. Overall, these findings highlight that trust levels are consistent across genders, with little meaningful difference observed.

The remaining characteristics, to be used as control variables in the econometric analysis, reveal notable differences between men and women. Women are slightly older, at 36.7 years compared to men at 34.5 years. There is no significant difference in marital status, with more than three quarters of all adults not being married. The results also indicate differences in self-reported health, as a smaller percentage of women report having excellent health (30.8% compared to 38.4% of men) suggesting that women may experience health challenges more frequently than their male counterparts. Furthermore, men are more likely to be employed (51%) than women (34,4%), despite comparable educational levels.

This economic disparity is compounded by demographic patterns, as 46.5% of women live in rural areas, compared to 41.3% of men. For expenditure, the results show that African women live in households with lower expenditure per capita (R1120, compared to R1749 for men). These factors are closely linked, as many African women remain in rural areas while men migrate to urban areas for work, resulting in limited employment opportunities for women. Living in rural regions often correlates with higher unemployment rates, contributing to lower household expenditures. It is essential to highlight the role of geographical area, as most social capital variables are neighbourhood-specific and may vary significantly between urban and rural contexts. This geographic dimension affects the availability of resources, the strength of support networks, and the availability of opportunities, amplifying the social and economic gaps experienced by men and women in their respective communities (Putnam, 2000; Stats

SA, 2021)

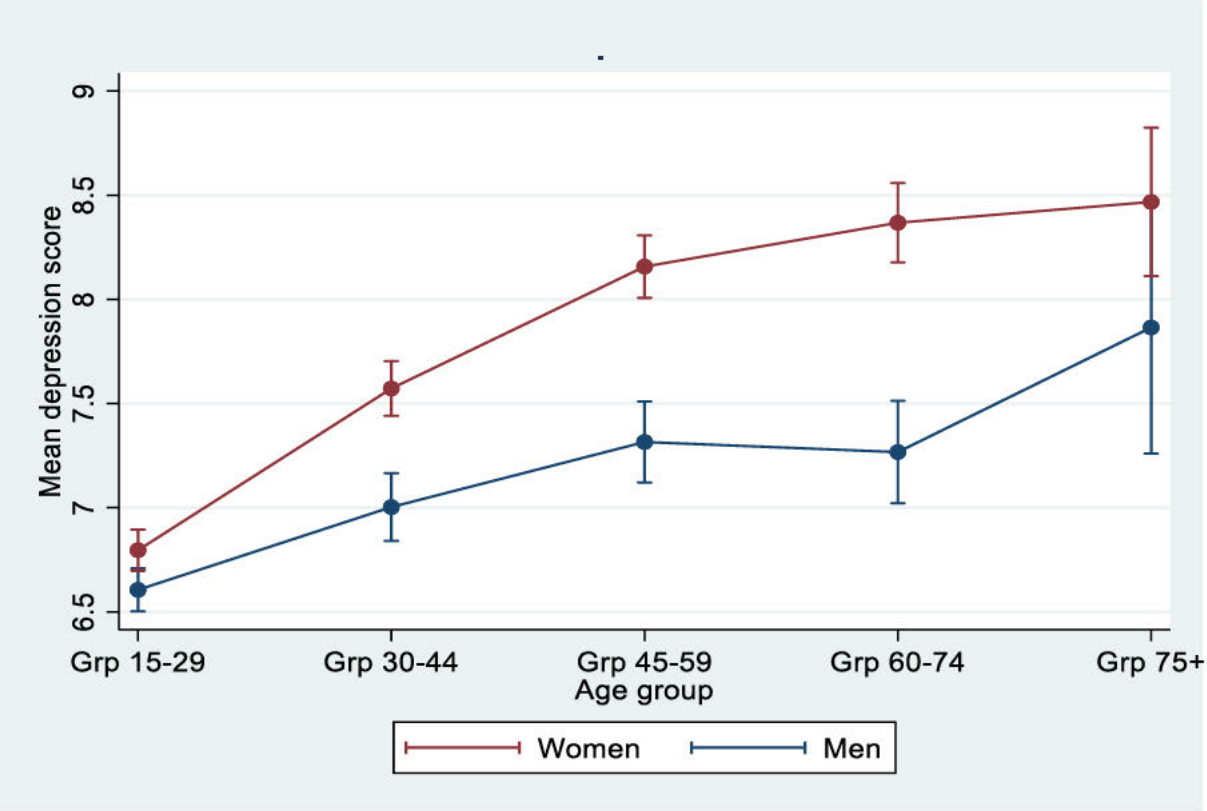
For the childcare variable, on average, approximately 5.6% of men report caring for children, indicating that very few men are involved in childcare responsibilities. In contrast, 89.8% of women report caring for children, which is significantly higher and suggests that women are often the primary caregivers in African family settings. The statistical significance of this difference indicates that women far more likely to be child carers compared to men. This touches on the subsequent variables of household decision-making, where majority of African households are headed by women, particularly single mothers (Myroniuk, 2016)

The results for household decision-making also highlight notable gender differences in the context of African households, where many are headed by women, particularly single mothers (Myroniuk, 2016). A small majority of respondents report being the main decision-maker in their household, with women slightly more likely to assume this role (59.3% for women and 56.8% for men), and the difference is statistically significant. Most individuals do not engage in joint decisions, but women significantly outpace men in this area (29.0% for women and 19.0% for men), indicated by the highly significant difference. Given that many African households are led by women, particularly single mothers (Myroniuk, 2016), these findings reflect an encouraging trend of women's increasing involvement in both main and joint decision-making roles, reflecting their critical role in household management and family welfare.

3.3.1 Change in depression over age

Table 3.1 showed that, on average, women have higher depression scores than men. This is notable despite women's greater levels of social capital in some dimensions, such as a stronger sense of belonging to their neighbourhoods and higher levels of social participation related to religious activities. However, it is important to consider that depression scores can vary throughout an individual's lifespan, and Table 3.1 revealed that, on average, women are older than men. To further explore this relationship, Figure 3.1 illustrates how average depression scores vary with age for both men and women within the analysis sample.

Figure 3.1: Change in depression over age.



Source: National Income Dynamics Study 2008, waves 1-5, own calculations.
Notes: The data are weighted.

Figure 3.1 shows the mean depression score at each age group, illustrating the rate of change of depression with respect to age. The figure reveals a striking trend: the average depression score increases rapidly as individuals approach late working age, before levelling off and then rising again in old age. Notably, women consistently report higher depression scores than men across all ages, highlighting a significant gender difference. This gender difference is often attributed to factors such as societal expectations, interpersonal stressors, and hormonal fluctuations that affect women's mental health. Women also face pressures from balancing career and family responsibilities, as well as experiences of trauma and social isolation, contributing to higher depression rates (Kuehner, 2017).

Depression in men aged 30-44 is often linked to job instability, financial stress, and strained relationships (Kisekka et al., 1990). In contrast, men in their 50s and 60s are more vulnerable to physical health issues, life transitions, and social isolation (Kisekka et al., 1990). For women aged 15-29, depressive symptoms are slightly higher than in men. Women's depression rates rise steadily, peaking at age 45-59 due to career and relationship pressures, while men's depression rates remain lower until a sharp increase occurs from ages 60-74 and beyond

(Kisekka et al., 1990). The differences in depression rates and their changes with age, as shown in Figure 3.1, highlight the importance of analysing the data by gender.

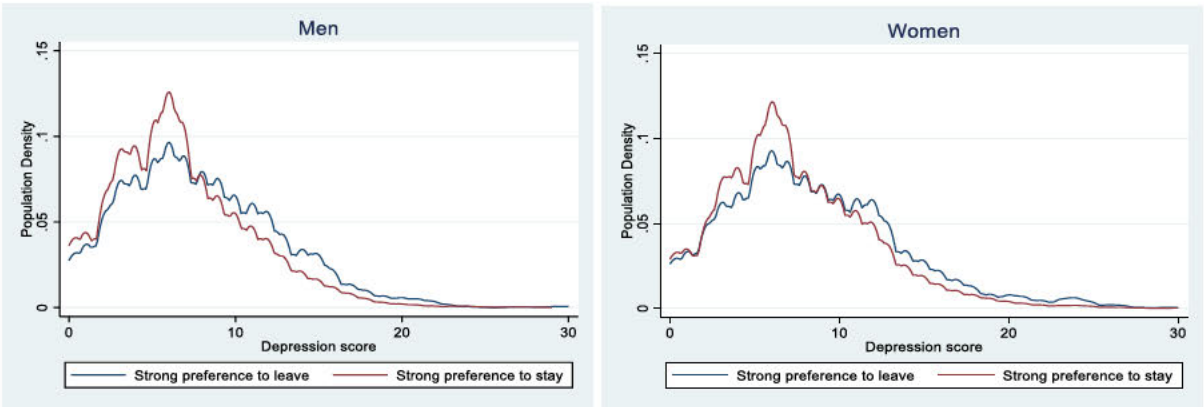
3.3.2 The distribution of depression by gender and social capital

The previous statistics presented mean depression scores. This section presents the full distribution of depression scores to highlight gender differences across the entire range of scores and to illustrate how depression varies with social capital. To facilitate this exploration, kernel density plots are used to visualize these distributions. As depicted in the plots, the integer nature of the depression score contributes to the somewhat "bumpy" appearance of the curves. The subsequent graphs illustrate the distribution of depression scores across individuals with varying levels of social capital, using the highest and lowest categorisation of a given measure of social capital as a comparison. For the sake of being brief, only selected measured of social capital are illustrated.

Preference to stay in the neighbourhood.

The kernel density plots in Figure 3.2 show the distribution of depression scores relative to preference to stay in the neighbourhood. The plots for both men and women exhibit a skewed distribution, with a majority of the population experiencing lower levels of depression. The peak on the left-hand side of the graph indicates that a high percentage of the population has a low depression score. At lower levels of depression, both men and women tend to prefer staying in their neighbourhood. However, at higher levels of depression, the distribution shifts towards a preference to leave. This suggests that feeling less connected to one's neighbourhood is linked to higher depression levels.

Figure 3.2: Distribution of depression by preference to stay in the neighbourhood.



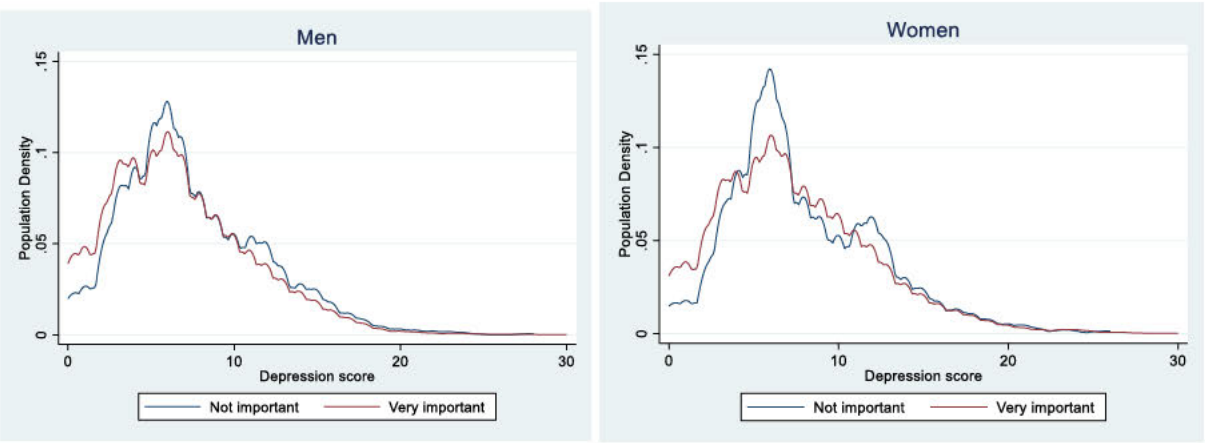
Source: National Income Dynamics Study 2008, waves 1-5, own calculations.
Note: Data are not weighted

The gender differences in this pattern reflect variations in social cohesion for both genders. The graph illustrates that although the general pattern is similar for both genders, the difference in the distribution of depression between those with strong preferences to stay and to leave is larger for men than it is for women. This difference is particularly observed between depressions scores of eight and sixteen.

Importance of religious activities

The relationship between mental health and religious activities differs by gender. Figure 3.3 reveals that a greater number of women who perceive religious activities as unimportant report lower levels of depression. In contrast, a greater share of men who view religious activities as highly important have low levels of depression. This suggests that while women may find emotional support outside of religious contexts, men derive substantial mental health benefits from their religious involvement.

Figure 3.3: Distribution of depression by importance of religious activities



Source: National Income Dynamics Study 2008, waves 1-5, own calculations.
Note: Data not weighted

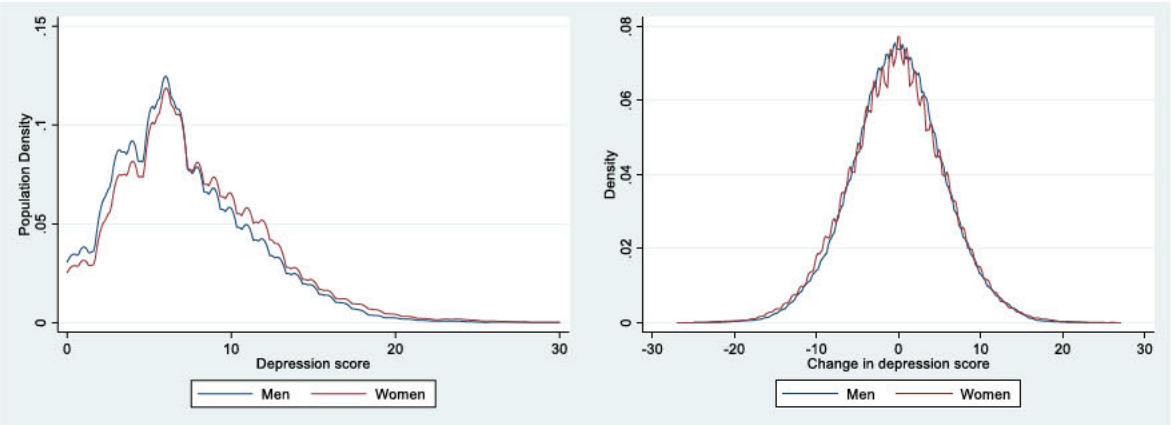
In general, these plots reveal that individuals with higher levels of social capital tend to exhibit lower levels of depression, with a decreasing pattern in depression scores as social capital increases. This finding is in line with research highlighting the protective effects of social capital on mental health (Cohen et al., 2015).

3.4 Changes in depression over time

The longitudinal nature of the NIDS data enables an analysis of individuals' depression over time, which is exploited in the regression models presented in Chapter 4. This section examines the patterns of change in depression over time descriptively, utilizing kernel density plots and

transition matrices. The kernel density plots provide a visual representation of the distribution of depression scores and the change in depression scores over time, while the transition matrices an examination of the movement between different levels of depression at each time point. Figure 3.4 provides a comprehensive visual representation of the distribution of depression scores and the change in depression over time, by gender. It illustrates how individuals' depression scores fluctuate across different waves, providing a smoothed distribution of these changes. By considering data from all five waves, the plot effectively captures short-term variations while also highlighting longer-term trends in depression scores. The depression score distribution, in the left panel, shows that a substantial proportion of both men and women are clustered at the lower end of the scale, with a peak density of 0.12 at a depression score of around 6. This suggests that many individuals, regardless of gender, experience relatively low levels of depression. However, there is a notable difference in the distribution of depression scores between men and women, with women tending to experience higher levels of depression than men. A larger share of men than women report very low depression scores, while a larger share of women than men have depression scores of above eight.

Figure 3.4: Distribution of change in depression score between waves, by gender



Source: National Income Dynamics Study 2008, waves 1-5, own calculations.
Note: Data not weighted

The kernel density plot on the right illustrates the distribution of the change in individuals' depression scores from one wave to the next. The graph reveals that the change in depression scores is approximately normally distributed, with most changes being small and clustered around the mean of zero. This suggests that most individuals experience a fairly consistent depression score over time, with relatively few extreme changes. Although depression scores differ between men and women, there is no notable gender difference in the distribution of the

change in depression scores over time. Overall, these kernel density plots provide a nuanced understanding of the distribution of depression scores and the change in depression over time, highlighting both similarities and differences between men and women.

Finally, transition matrices presented in Table 3.2 provide an examination of the patterns of change of depression from one wave to another, using the binary depression variable to examine acute changes in depression. They also provide a detailed examination of how individuals move between depression states across successive waves. These matrices explicitly present the probabilities of remaining in the same state (not depressed or depressed) or transitioning to a different state at each wave, thereby enabling an understanding of persistence and remission in depression over time. For both genders, the majority of individuals are not depressed in the initial wave. The proportion of individuals persisting in this not-depressed state is relatively high, with 86.84% of men and 83.46% of women who were not depressed at one wave continuing to be not depressed in the next wave.

Table 3.2: Transition matrix of depression, by gender

Men				***Women***		
	Not Depressed	**Depressed**	**Total**	**Not Depressed**	**Depressed**	**Total**
Not Depressed	10,983	1,716	12,699	15,687	3,108	18,795
	86.84	13.51	100.00	83.46	16.54	100.00
Depressed	1,837	364	2,201	3,510	867	4,377
	83.46	16.54	100.00	80.19	19.81	100.00
Total	12,820	2,080	14,900	19,197	3,975	23,172
	86.04	13.35	100.00	82.85	17.15	100.00

Source: National Income Dynamics Study 2008, waves 1-5, own calculations.
Note: Depression is measured as a binary variable, using a cut-off score of 12: scores below 12 indicate no depression, while scores above 12 indicate depression.

The proportion of not depressed individuals who transitioned to a depressed state is 13.51% among men and 16.54% among women. This suggests that women are more likely to develop depression than men. For men, of the depressed, 16.54% stay depressed in the next wave while 83.46% recover. In women, of the depressed, 19.81% stay depressed and 80.19% recover. Therefore, recovering is much more likely than persisting in depression. Although both genders have high probabilities of transitioning out of depression, depression persistence is also higher for women than for men. This disparity in depression prevalence and remission rates between

women and men may be attributed to various factors, one of which may be the role played by social capital in shaping their mental health experiences. However, the descriptive analysis presented in this chapter cannot establish these connections between social capital and depression. This is the aim of the regression analysis in the next chapter.

3.5 Changes in social capital over time

In the section above, the changes in depression over time were examined, with a focus on its persistence and recovery patterns across different groups. Now, the focus is shifted to social capital and how it evolves from Waves 1 to 5 in the NIDS data panel. A strong sense of social capital is often linked to improved mental health outcomes, making it essential to understand its development over time. In this section, key variables used in this study to measure social capital, including neighbourhood attachment, perceptions of safety, trust in others, and participation in religious or community activities, are analysed. However, variations in trust levels, perceived safety, and community involvement across different groups may indicate that social capital does not develop uniformly. Understanding these patterns is crucial for exploring whether social capital serves as a protective factor against mental health challenges like depression and how its impact may differ across demographic groups. Table 3.3 presents the transition matrices that illustrate these shifts in social capital over time.

Table 3.3: Transition matrix of social capital, by gender

	Women					*Men*				
Location Preference	0	1	2	3	4	0	1	2	3	4
0 = Strong preference to leave	7.79	7.26	14.61	15.57	54.77	6.99	8.46	15.81	19.12	49.63
1 = Moderate preference to leave	7.00	7.56	15.19	17.50	52.74	5.30	7.40	16.91	19.12	51.27
2 = No preference	5.98	7.63	15.10	15.75	55.54	6.09	7.11	16.02	17.30	53.48
3 = Moderate preference to stay	4.81	5.20	11.37	15.36	63.26	6.14	6.61	12.37	15.57	59.30
4 = Strong preference to stay	3.89	4.82	10.43	14.73	66.14	5.09	5.73	11.84	16.24	61.10
Total	4.61	5.45	11.54	15.12	63.28	5.50	6.29	12.98	16.60	58.64
Neighbourhood safety										
0 = Low crime, low violence	66.95	13.03	10.81	9.21		67.43	13.21	10.38	8.98	
1 = High crime, low violence	53.22	21.37	10.57	14.83		53.05	21.13	11.05	14.76	
2 = Low crime, high violence	62.47	14.52	10.27	12.74		60.65	14.23	12.26	12.86	
3 = High crime, high violence	48.54	22.29	11.28	17.88		49.51	19.83	11.47	19.19	
Total	62.45	15.41	10.76	11.37		62.65	15.17	10.81	11.37	
Importance of religious activities										
0 = Not important at all	5.19	9.03	44.47	41.31		10.71	13.06	43.25	32.98	
1 = Unimportant	4.60	4.94	49.49	40.97		8.70	12.90	46.54	31.86	
2 = Important	1.76	3.76	45.12	49.37		6.06	8.28	45.71	39.95	
3 = Very important	1.42	2.96	41.89	53.74		4.99	7.21	44.77	43.03	
Total	1.76	3.50	43.67	51.07		6.18	8.59	45.27	39.95	
Neighbourhood Trust (Neighbour)										
0=Somewhat or not likely	86.28	13.72				86.56	13.44			
1=Very likely	84.73	15.27				85.22	14.78			
Total	86.07	13.93				86.38	13.62			
Neighbourhood Trust (Stranger)										
0=Somewhat or not likely	92.75	7.25				93.36	6.64			
1=Very likely	91.68	8.32				92.05	7.95			
Total	92.67	7.33				93.26	6.74			

Source: National Income Dynamics Study 2008, waves 1-5, own calculations.

Note: Data not weighted

The transition matrix results for men reveal key trends in the change of social capital, measured through location preference, neighbourhood safety, religious importance, and trust. Over time, men's attachment to their neighbourhoods increases, indicating stronger local social capital. Among men who initially had the highest level of neighbourhood attachment (rating 4), 61.10% maintain this level in the next wave, suggesting stability in their sense of place attachment. Furthermore, individuals in lower attachment categories (ratings 0-2) show movement toward higher categories, reinforcing the idea that neighbourhood ties strengthen over time. Comparatively, women are slightly more likely than men to transition to the highest level of neighbourhood attachment, with 66.143% of women who start in this category maintaining their strong attachment. This suggests that women may experience greater growth in neighbourhood social capital over time.

Regarding neighbourhood safety, 67.43% of men who initially reported low crime and low violence continue to do so in the next wave, indicating a high persistence of perceived neighbourhood safety. This trend is similar for women, with 66.95% maintaining their perception of safety across waves. Additionally, there is strong evidence of individuals transitioning to safer neighbourhoods at similar rates for both genders. However, some individuals experience a decline in perceived safety, with the proportion of men reporting low crime and low violence decreasing to 62.65% over time. Meanwhile, a small but persistent group (19.19%) continues to report high crime and high violence. Compared to women, men’s experiences with crime are slightly worse, though both genders show an increasing awareness of safety concerns. The decline in perceived safety may hinder the development of social capital, as crime can weaken trust and reduce engagement in community activities.

Religious participation remains an important form of social capital for men, though it appears to be less stable over time compared to other forms. Among men who initially rated religious activity as "very important," 43.03% continue to do so in the next wave, indicating some persistence but also notable movement across categories. This suggests that religious activities continue to play a role in shaping social networks and community involvement, though with greater variability than other dimensions of social capital. Additionally, the variability of religious importance differs more by gender than other forms of social capital, highlighting potential differences in how men and women engage with religious communities over time. Nevertheless, the overall persistence of religious importance highlights its role in fostering social cohesion and connections within communities.

For neighbourhood trust, the proportion of men who initially believed their neighbours were very likely to return a lost wallet increased from 13.62% to 14.78%. A similar trend is observed among women, where this percentage rose from 13.93% to 15.27%. This suggests a gradual strengthening of localized trust. However, a substantial majority of both men (86.38%) and women (86.07%) remain in the low-trust category, indicating that neighbourhood trust is still relatively weak. For generalized trust, which measures trust in strangers, there is very little movement over time. Among men, only 6.74% express high trust in strangers, compared to 7.33% among women. These figures remain largely stable, reinforcing the idea that while trust in immediate social networks shows some improvement, broader societal trust remains persistently low. These results confirm that social capital is not static, demonstrating that there are considerable movement across categories for all dimensions of social capital, neighbourhood attachment, trust, religious importance, and perceptions of neighbourhood safety, among both men and women. These transition matrices indicate that social capital is not time-invariant or close to it but rather evolves over time. This justifies the use of Fixed Effects (FE) estimation, which will exploit within-individual variations to better estimate the relationship between social capital and mental health. This method is particularly useful in addressing unobserved individual heterogeneity, as discussed in detail in Chapter 4.

When depression and social capital transition matrices are compared, the findings suggest that women experience higher depression rates and persistence than men, despite exhibiting slightly stronger social capital in areas like neighbourhood attachment. This indicates that while social capital plays an important role in mental well-being, it does not fully buffer against depression, especially for women who may face additional social or economic stressors. The higher concerns about safety and lower generalized trust among women likely contribute to their increased depression risk, highlighting the need for further analysis (such as the regression models in the next chapter) to explore these complex relationships. Addressing both social capital and broader structural issues, such as safety, economic stability, and social support systems, could be key to reducing depression and enhancing well-being.

3.6 Conclusion

This chapter first outlined the data, and the measures used in the empirical analysis, before presenting summary statistics for the analysis sample. The analysis of five waves of the longitudinal NIDS data enables the examination of differences in mental health both within and between individuals. The ten-item CES-D score is used to quantify the respondents'

depression, which is the dependent variable for mental health. The main explanatory variable is social capital, which is proxied using five measures. The descriptive statistics showed that women have higher average depression scores than men, showing a clear difference in mental health between genders. However, women also tend to greater social capital for some measures, like a stronger attachment to their neighbourhood and greater involvement in religious activities, factors which can help improve their mental health. Both genders have high probabilities of transitioning out of depression over time, but depression persistence is higher for women than for men. The gender disparity in mental health in South Africa is therefore evident in the results in this chapter, and there are also several gender variations in social capital. Descriptive statistics, however, are not able to distinguish between the contributions of various elements, even though they are helpful in characterizing the dataset's mean features or characteristics.

In Chapter 4, regression analysis will be employed to explore the independent relationships between social capital and mental health outcomes for both men and women. This econometric approach aims to delineate how various elements of social capital, such as community engagement, trust, and support networks, correlate with mental health indicators across genders. To enhance the robustness of the analysis, a range of control variables will be included, as summarised in the descriptive statistics in this chapter. By examining these associations while controlling for these key variables, the research seeks to uncover nuanced insights into how social capital influences mental health in South Africa.

Chapter 4: Regression analysis

In Chapter 3, a comprehensive descriptive analysis was conducted, revealing that women experience higher average depression scores than men. This group also displays greater social capital, particularly in religious importance and neighbourhood attachment. In addition to having greater depression prevalence, women face greater persistence of symptoms over time compared to men, who have higher chances of transitioning out of depression. Building on this insight, this chapter conducts an econometric analysis of the relationship between social capital and depression, utilizing the longitudinal data from all five waves of the NIDS to investigate the individual patterns of mental health over time. Working with this longitudinal data will assist in examining how access to social capital is associated with changes in individuals' depression over a period of time. It also addresses unobserved individual heterogeneity, which is linked to the incidence of depression, allowing for a more accurate understanding of how personal characteristics and social factors interact in influencing mental health outcomes.

This chapter is organized into five distinct sections. Section 4.1 provides an overview of the econometric approach used in the analysis. Section 4.2 presents the results of the analysis, discussing the key findings and interpreting their significance. Section 4.3 summarizes the key findings and links them with the previous literature, while Section 4.4 addresses potential limitations of the estimation process. Finally, Section 4.5 concludes the chapter by giving a general summary of the main findings.

4.1 Econometric approach

The general relationship to be estimated using regression analysis in this chapter is summarised in equation 4.1 below. The equation presents the depression level of individual $\boldsymbol{i}$ at time $\boldsymbol{t}$, which is the outcome variable being measured. $\boldsymbol{Social\ capital_{it}}$ denotes the level of social capital of individual $\boldsymbol{i}$ at time $\boldsymbol{t}$, which is proxied through a range of variables, as discussed below. $\boldsymbol{Covariates_{it}}$ refers to other variables that may influence depression, such as age or health status, also measured at time $\boldsymbol{t}$. The individual fixed effect is represented by α_i, which captures unobserved characteristics that are constant over time and unique to each individual. This allows for differences between individuals that may not be captured by the other variables. The coefficient vectors $\boldsymbol{\delta_1}$ and $\boldsymbol{\delta_2}$ represent the estimated change in depression for a one-unit change in social capital and covariates, respectively, while controlling for the other variables. Finally, ε_{it} is the error term, which represents unobserved factors that affect depression at time $\boldsymbol{t}$ for individual $\boldsymbol{i}$, such as random events or measurement errors. The equation is estimated

separately for men and women to analyse the unique factors influencing mental health in each gender, thereby addressing specific inequalities in social and mental well-being (Mutyambizi et al., 2019). The NIDS panel weights are used throughout the estimation, to correct for survey non-response and attrition.

$$\boldsymbol{Depression_{it}} = \boldsymbol{\delta_0} + \boldsymbol{\delta_1 Social\ capital_{it}} + \boldsymbol{\delta_2 Covariates_{it}} + \boldsymbol{\alpha_i} + \boldsymbol{\varepsilon_{it}} \quad (4.1)$$

Social capital is the key predictor of depression in this dissertation. As described in Chapter 3, it is proxied using the preference to stay in the current location, neighbourhood safety, the importance of religion, and social trust. The control variables can be similarly expanded, to produce estimating equation 4.2 below.

$$\begin{aligned}\boldsymbol{Depression_{it}} &= \boldsymbol{\beta_0} + \boldsymbol{\beta_1 Location\ Pref_{it}} + \boldsymbol{\beta_2 Neighbourhood\ safety_{it}} \\ &+ \boldsymbol{\beta_3 Importance\ Religion_{it}} + \boldsymbol{\beta_4 Trust\ of\ neighbour_{it}} \\ &+ \boldsymbol{\beta_5\ Trust\ of\ stranger_{it}} + \boldsymbol{\beta_6\ Joint\ decision_{it}} \\ &+ \boldsymbol{\beta_7\ Main\ decision_{it}} + \boldsymbol{\beta_8\ Marital\ status_{it}} \\ &+ \boldsymbol{\beta_9\ Health\ status_{it}} + \boldsymbol{\beta_{10}\ Childcare_{it}} + \boldsymbol{\beta_{11}\ Employment\ status_{it}} \\ &+ \boldsymbol{\beta_{12}\ Education_{it}} + \boldsymbol{\beta_{13}\ Geotype_{it}} + \boldsymbol{\beta_{14}\ HHexpenditure_{it}} + \boldsymbol{\alpha_i} \\ &+ \boldsymbol{\varepsilon_{it}}\end{aligned} \quad (\mathbf{4.2})$$

Most of the factors shown in this equation are categorical in nature, as shown in the previous chapter, and are therefore included in the model in the form of a set of dummy variables. However, following Adjaye-Gbewon et al (2018), as covered in the literature in chapter 2, the measures for trust of neighbours and trust of strangers are included in the model in the form of an interaction between individual-level and district-level variables. The interaction term is used to test whether the relationship between individual-level trust and depressive symptoms differs across districts with varying average levels of trust.

Two key econometric issues need to be decided before the model can be estimated: the model type, which is based on the format of the dependent variable, and the estimation method. For the model type, the dependent variable in the econometric analysis in this chapter is treated in the same two ways as in the descriptive analysis shown in Chapter 3. First, a continuous dependent variable model is estimated, where depression is measured as a CES-D-10 score ranging from 1 to 30. Using a continuous depression measure allows for quantifying the precise

relationship between the social capital variables and depression levels. The coefficients of the independent variables represent the number of units that a change in each variable contributes to the depression score, while holding other factors constant. Second, the binary version of the dependent variable is employed to enable the analysis of mental health outcomes within a dichotomous framework (Long and Freese, 2014). Here, a logistic regression model is estimated that predicts the likelihood of an individual experiencing depression at a given time (t), where the logarithm of the odds of depression is calculated. Using both continuous and logistic approaches enables an analysis of whether findings differ when depression is treated as a state of being (binary outcome) versus the extent of depression (continuous variable) (Hosmer et al., 2013).

The second key issue is the estimation method. The analysis will begin with a pooled estimation, which serves as the foundation for the empirical investigation. The pooled ordinary least squares (POLS) model is a widely used econometric method that treats the data as a pooled cross-sectional and time series dataset (Wooldridge, 2003). This approach assumes that the relationship between social capital and mental health is constant across all individuals and time periods, allowing for the estimation of the average relationship between the two variables (Baltagi, 2008).

However, the POLS model has its limitations. It does not account for individual-specific heterogeneity, shown by α_i in equations 4.1 and 4.2, that may affect both social capital and mental health outcomes. Panel data analysis often faces endogeneity concerns, where the relationship between the independent and dependent variables is potentially biased due to unobserved confounders (Arellano, 2003). For example, factors like the socioeconomic status at the time of observation, unmeasured cultural influences and intrinsic psychological traits might influence both an individual's mental health and their ability to build or maintain social capital. The fixed effects estimation method is therefore used to estimate the relationship between social capital and mental health while controlling for time-invariant unobserved heterogeneity among individuals that may bias the estimated relationship, thereby providing more reliable estimates (Arellano, 2003). For the binary estimation, a conditional logit model is used to conduct logistic fixed effects estimation with survey weights (Seetaram & Petit, 2012). A key requirement for this approach is that an individual's depression status must change at least once across the survey waves. Consequently, individuals whose depression scores remain constant, whether always depressed or never depressed, are excluded from the logistic analysis. This may introduce a form of sample selection bias, as the results will be based only

on those who experience variation in depression over time. This form of sample selection bias is not incurred in the FE estimation that uses the continuous depression score, and therefore differences in the results between the continuous and binary models may be caused in part by sample selection bias.

4.2 Results and Discussion

The following tables present the regression results for the sample of African adults aged 15 years and older. The regression models were first estimated with only the social capital variables included as explanatory variables, shown in Table 4.1, and then again with the control variables added in Table 4.2. Finally, Table 4.3 compares the estimation of depression by model type. This table focuses on the impact of treating depression as a binary outcome versus a continuous measure, highlighting how this distinction affects the results.

4.2.1 Social capital variables

The initial phase of the analysis focuses on presenting the outcomes pertaining to the social capital variables across two distinct statistical models: Pooled Ordinary Least Squares (OLS) and linear Fixed Effects estimation. This comparative examination provides a comprehensive view of the impact of social capital on depression. The sample size in the regression analysis is slightly smaller than in the descriptive statistics and transition matrices because only observations with complete data for all variables included in the regression model can be used. This ensures that the analysis is based on a fully observed dataset. Table 4.1 displays the coefficients for the five key social capital measures, as well as the wave in which data were collected. Overall, Table 4.1 reveals that higher levels of social capital are associated with better mental health outcomes. However, the magnitude of this relationship varies by gender and is not consistent across all measures of social capital.

Table 4.1: Models for depression (CES-D score) and social capital, by gender

Depression (CES-D-10 score) **VARIABLES**	**Pooled OLS Men**	**Pooled OLS Women**	**Fixed effects Men**	**Fixed effects Women**
Location preference				
Moderate preference to leave	0.280	-0.429*	0.185	-0.225
	(0.279)	(0.232)	(0.303)	(0.255)
No preference	-0.109	-0.203	-0.204	-0.197
	(0.226)	(0.203)	(0.246)	(0.223)
Moderate preference to stay	0.107	-0.312	-0.234	-0.519**

Depression (CES-D-10 score) **VARIABLES**	**Pooled OLS Men**	**Pooled OLS Women**	**Fixed effects Men**	**Fixed effects Women**
	(0.221)	(0.196)	(0.236)	(0.222)
Strong preference to stay	-0.689***	-1.030***	-0.942***	-1.321***
	(0.200)	(0.182)	(0.217)	(0.197)
Neighbourhood safety				
High crime, low violence	-0.074	0.177*	-0.226	-0.092
	(0.116)	(0.101)	(0.140)	(0.118)
Low crime, high violence	0.531***	0.462***	0.471***	0.381***
	(0.130)	(0.115)	(0.152)	(0.135)
High crime, high violence	0.828***	0.744***	0.566***	0.350**
	(0.126)	(0.115)	(0.153)	(0.136)
Importance of religious activities				
Unimportant	-0.407*	0.225	-0.370	0.355
	(0.228)	(0.318)	(0.234)	(0.365)
Important	-0.717***	-0.104	-0.465**	0.161
	(0.198)	(0.264)	(0.187)	(0.309)
Very important	-1.159***	-0.483*	-0.797***	-0.184
	(0.206)	(0.266)	(0.199)	(0.310)
Trust of neighbours (personalized trust)				
Individual level				
Very likely	0.625*	0.094	0.993***	0.446
	(0.319)	(0.245)	(0.358)	(0.281)
District level				
%Very likely	0.021***	0.011**	0.027***	0.020***
	(0.006)	(0.005)	(0.007)	(0.006)
Cross-level interaction				
% Very likely*Very likely	-0.026*	-0.002	-0.037**	-0.010
	(0.015)	(0.012)	(0.016)	(0.014)
Trust of stranger (generalized trust)				
Individual level				
Very likely	1.768***	1.573***	1.724***	1.548***
	(0.317)	(0.242)	(0.363)	(0.288)
District level				
%Very likely	-0.001	-0.010	0.016*	0.007
	(0.008)	(0.006)	(0.008)	(0.007)
Cross-level interaction				
% Very likely*Very likely	-0.016	0.008	-0.025	-0.001
	(0.019)	(0.016)	(0.022)	(0.018)
Waves				
Wave = 2	-0.977***	-1.449***	-1.113***	-1.533***
	(0.149)	(0.134)	(0.160)	(0.139)
Wave = 3	-0.958***	-1.419***	-0.976***	-1.325***
	(0.135)	(0.126)	(0.141)	(0.130)
Wave = 4	-0.918***	-1.606***	-0.849***	-1.369***
	(0.134)	(0.120)	(0.142)	(0.126)
Wave = 5	-1.074***	-1.594***	-0.790***	-1.191***

Depression (CES-D-10 score) VARIABLES	Pooled OLS Men	Pooled OLS Women	Fixed effects Men	Fixed effects Women
	(0.129)	(0.117)	(0.141)	(0.124)
Constant	8.331***	9.320***	8.093***	8.935***
	(0.297)	(0.331)	(0.293)	(0.370)
Observations	22,084	31,366	22,084	31,366
Number of pid in panel regressions			7,346	9,340
R-squared	0.042	0.042	0.043	0.048

Source: National Income Dynamics Study 2008, waves 1-5, own calculations.

Notes: The sample includes all African adults aged 15 age and older. N = 28,000 individuals across and about 7,000 households. Data was collected from 2008 to 2020. The estimates are weighted. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

The relationship between location preference and depression levels reveals distinct effects based on gender across both pooled OLS and fixed effects models. For men, a strong preference to stay is significantly associated with lower depression levels, showing a decrease of 0.689 in the pooled OLS model and 0.942 in the fixed effects model compared to someone with a strong preference to leave, both significant at the 1% level. In contrast, other preferences, such as a moderate preference to leave, no preference, and moderate preference to stay, are not significantly associated with depression levels. For women, a strong preference to stay also correlates with significantly lower depression levels compared to someone with a strong preference to leave, with a decrease of 1.030 in the pooled OLS model and 1.321 in the fixed effects model, both significant at the 1% level. Additionally, a moderate preference to leave is associated with a significant decrease in depression levels of 0.429 in the pooled OLS model. In the fixed effects model, a moderate preference to stay is correlated with a 0.519 decrease in depression levels, significant at the 5% level for women.

These findings suggest that individuals who strongly prefer to remain in their current location, reflecting their sense of neighbourhood attachment, an aspect of social cohesion, tend to experience lower levels of depression compared to those with a strong preference to leave. Notably, while both genders benefit from neighbourhood attachment, women experience a larger reduction in depression than men. In both models, a strong preference to stay is linked to significantly lower depression levels for men and women, suggesting it serves as a protective factor against depression. However, particularly for women, a moderate preference to leave correlates with decreased depression levels, an effect not captured for men in both models.

The coefficients for the strong preference to stay become more negative in the fixed effects model compared to the pooled OLS model for both genders, indicating a stronger association with reduced depression levels. This increase in the magnitude of the negative coefficients can be attributed to the fixed effects model's ability to control for unobserved, time-invariant characteristics that may confound the relationship in the pooled OLS model. By focusing on within-person changes over time, the fixed effects model captures the true effect of location preference by accounting for individual stability factors, that could obscure the relationship in the pooled analysis. Thus, the stronger negative coefficients in the fixed effects model suggest that the protective impact of a strong preference to stay is more pronounced when these individual differences are controlled for, highlighting the significance of this preference in enhancing mental well-being.

The second measure of social cohesion is neighbourhood safety, where different types of unsafe neighbourhoods are compared to those with low crime and low violence. The results reveal that both men and women living in neighbourhoods with high levels of violence, regardless of overall crime rates, experience increased levels of depression. This suggests that the perception of safety and exposure to violence can significantly impact mental well-being. The significant coefficients across the models confirm that this relationship is robust and suggests a consistent pattern across the sample. In contrast, individuals living in neighbourhoods with high crime rates, but low violence typically experience an insignificant decrease in depression compared to those in low crime and low violence areas. This suggests that while crime can contribute to mental health issues, the presence of violence plays a more significant role in exacerbating depressive symptom. This finding reinforces the predominant role of crime in South Africa neighbourhoods (Tsaneva and LaPlante, 2024).

Social participation is measured by the importance of religious activities, where the results reveal distinct patterns for men and women. For men, placing importance on religious activities is associated with significant decreases in depression scores, compared to those who place no importance on them, with a notable reduction in the pooled OLS model. While the magnitude of this effect decreases in the fixed effects model, it remains statistically significant. In contrast, for women, viewing religious activities as very important shows a significant decrease in depression scores in the pooled OLS model, compared to those who don’t place importance on them, while no significant relationships are found in the fixed effects model. This highlights the distinct impact of religious engagement on mental well-being across genders, with men benefiting more consistently from the importance of religious activities.

The final element of social capital included in the model is social trust. Following Adjaye-Gbewonyo et al. (2018), the models include a cross-level interaction between trust measured at the individual level and at the district level. The trust variable reveals an unexpected association, indicating that trusting one's neighbours and strangers correlates with increased levels of depression for both men and women. The results reveal that, as the district level of trust of neighbours approaches zero, men who are very likely to trust their neighbours (personalized trust) have significantly increased depression levels, compared to those who somewhat or not likely trust, with coefficients of 0.625 in the pooled OLS model and 0.993 in the fixed effects model. Similarly, for women in the same category, depression levels are higher, although not significantly so.

Greater trust at the district level is associated with significantly higher depression scores for individuals who do not themselves have high trust of neighbours, for both genders and in both the pooled OLS model and the fixed effects model. However, the negative cross-level interaction coefficients show that, as the district level of trust of neighbours increases towards 100 percent, individuals who are very likely to trust their neighbours have lower depression scores than those who are less trusting. This interaction is negative for both genders, but it is significant only for men. These findings reinforce the notion that a trusting community environment (district level) can alleviate the negative effects of individual trust on depression, but mainly for men.

For generalized trust (trusting a stranger), the coefficients for individuals are strikingly higher: in non-trusting districts, men who are very likely to trust strangers have significantly higher depression scores by 1.768 in the pooled OLS model and 1.724 in the fixed effects model. The pattern for women is similar, with slightly smaller but nonetheless significant associations. These findings suggest that for non-trusting individuals, living in a district that has greater levels of trust of strangers has little association with depression. This is in contrast to the positive and significant relationship for district-level trust of neighbours. The cross-level interaction coefficients are again negative in most of the models, suggesting slightly lower depression scores for trusting individuals who living in more trusting districts, but the associations are not large enough to be statistically significant.

4.2.2 Full model for depression

The analysis is now expanded by introducing demographic and socioeconomic control variables into the depression model, to capture a more comprehensive range of factors that may

influence mental health outcomes. Failing to control for other factors associated with depression could bias the social capital variables if they are correlated with omitted variables. Including these controls aims to isolate the relationship between social capital and depression from these other influencing factors, allowing for a clearer understanding of how they interact. Table 4.2 below presents the expanded depression models, the models are estimated separately by gender, using both pooled OLS and FE methods.

Table 4.2: Models for depression (CES-D10 score) and social capital, including control variables, by gender

Depression (CES-D-10 score) **VARIABLES**	**Pooled OLS Men**	**Pooled OLS Women**	**Fixed effects Men**	**Fixed effects Women**
Location preference				
Moderate preference to leave	0.286	-0.355	0.142	-0.227
	(0.268)	(0.226)	(0.299)	(0.257)
No preference	-0.161	-0.119	-0.228	-0.133
	(0.218)	(0.195)	(0.240)	(0.221)
Moderate preference to stay	0.033	-0.324*	-0.239	-0.454**
	(0.211)	(0.191)	(0.232)	(0.221)
Strong preference to stay	-0.829***	-1.198***	-0.940***	-1.221***
	(0.191)	(0.177)	(0.214)	(0.197)
Neighbourhood safety				
High crime, low violence	-0.170	0.036	-0.252*	-0.137
	(0.112)	(0.098)	(0.139)	(0.118)
Low crime, high violence	0.516***	0.377***	0.456***	0.364***
	(0.128)	(0.112)	(0.151)	(0.135)
High crime, high violence	0.649***	0.608***	0.506***	0.318**
	(0.124)	(0.111)	(0.154)	(0.135)
Importance of religious activities				
Unimportant	-0.437**	0.245	-0.431*	0.368
	(0.218)	(0.313)	(0.229)	(0.364)
Important	-0.567***	-0.054	-0.506***	0.079
	(0.189)	(0.262)	(0.181)	(0.306)
Very important	-0.949***	-0.412	-0.810***	-0.212
	(0.196)	(0.263)	(0.192)	(0.308)
Trust of neighbours (personalized trust)				
Individual level				
Very likely	0.768**	0.198	0.992***	0.476*
	(0.315)	(0.242)	(0.363)	(0.285)
District level				
%Very likely	0.020***	0.012**	0.028***	0.021***
	(0.006)	(0.005)	(0.007)	(0.006)
Cross-level interaction				
% Very likely*Very likely	-0.027*	-0.002	-0.037**	-0.010
	(0.014)	(0.012)	(0.017)	(0.014)

Depression (CES-D-10 score) VARIABLES	Pooled OLS Men	Pooled OLS Women	Fixed effects Men	Fixed effects Women
Trust of stranger (generalized trust)				
Individual level				
Very likely	1.636***	1.585***	1.684***	1.486***
	(0.304)	(0.241)	(0.359)	(0.290)
District level				
%Very likely	0.001	-0.008	0.016*	0.008
	(0.008)	(0.006)	(0.008)	(0.007)
Cross-level interaction				
% Very likely*Very likely	-0.016	0.001	-0.024	-0.004
	(0.018)	(0.016)	(0.022)	(0.018)
Age in years	0.154***	0.148***	-0.094	-0.291**
	(0.016)	(0.012)	(0.140)	(0.125)
Age Squared	-0.001***	-0.001***	-0.001***	-0.002***
	(0.000)	(0.000)	(0.000)	(0.000)
Marital status				
Married	1.139***	0.603***	0.608***	-0.100
	(0.126)	(0.096)	(0.233)	(0.177)
Self-reported health status				
Good	-1.146***	-1.206***	-0.807***	-0.778***
	(0.195)	(0.125)	(0.213)	(0.146)
Very good	-1.631***	-1.632***	-1.245***	-1.164***
	(0.190)	(0.126)	(0.212)	(0.149)
Excellent	-1.926***	-1.813***	-1.537***	-1.428***
	(0.195)	(0.132)	(0.213)	(0.156)
Employment status				
Unemployed	-0.217	0.314***	0.401***	0.388***
	(0.135)	(0.103)	(0.155)	(0.132)
Employed	-0.668***	-0.475***	-0.582***	-0.356***
	(0.115)	(0.090)	(0.147)	(0.119)
Education				
Incomplete secondary education	-0.279**	0.331***	0.015	-0.201
	(0.115)	(0.099)	(0.228)	(0.294)
Matric	-0.337**	-0.294**	0.200	0.368
	(0.155)	(0.127)	(0.333)	(0.372)
Tertiary education	-0.781***	-0.636***	0.059	0.188
	(0.177)	(0.141)	(0.388)	(0.423)
Geographical area				
Urban	0.276***	0.339***	0.309	0.567**
	(0.085)	(0.072)	(0.224)	(0.245)
Childcare				
Number of children being cared for	0.071	0.089***	0.002	0.086*
	(0.121)	(0.032)	(0.139)	(0.051)
Household expenditure per capita in R'000	-0.071***	-0.073***	-0.065**	-0.031
	(0.017)	(0.021)	(0.026)	(0.028)
Makes main decisions				
Main decisions	0.119	-0.011	0.184	-0.142

Depression (CES-D-10 score) VARIABLES	Pooled OLS Men	Pooled OLS Women	Fixed effects Men	Fixed effects Women
	(0.110)	(0.090)	(0.148)	(0.114)
Makes joint decisions				
Joint decisions	-0.201**	0.234***	-0.129	-0.234**
	(0.100)	(0.080)	(0.123)	(0.100)
Waves				
Wave = 2	-0.908***	-1.300***	-0.583	-0.394
	(0.150)	(0.133)	(0.370)	(0.315)
Wave = 3	-0.927***	-1.292***	-0.080	0.543
	(0.135)	(0.126)	(0.609)	(0.527)
Wave = 4	-0.888***	-1.454***	0.524	1.500*
	(0.133)	(0.119)	(0.946)	(0.826)
Wave = 5	-0.977***	-1.427***	1.102	2.613**
	(0.129)	(0.118)	(1.245)	(1.099)
Constant	7.391***	7.874***	13.572***	20.888***
	(0.446)	(0.398)	(3.964)	(3.861)
Observations	21,908	31,102	21,908	31,102
Number of pid			7,338	9,331
R-squared	0.093	0.102	0.0594	0.0905
Pseudo R-squared				

Source: National Income Dynamics Study 2008, waves 1-5, own calculations.

Notes: The sample includes all African adults aged 15 age and older. N = 28,000 individuals across and about 7,000 households. Data was collected from 2008 to 2020. The estimates are weighted. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Controlling for demographic and socioeconomic variables in the expanded depression model generally weakens the magnitude of the relationship between social capital and depression, although not universally so, while the significance levels of the social capital variables typically remain consistent. In the pooled OLS model for men. The coefficients for preferences to stay reveal important insights. Men with a strong preference to stay maintain a significant negative association with depression, compared to those with a strong preference to leave, with the coefficient magnitude increasing from -0.689 to -0.829 after adding the controls. The more negative coefficient indicates a strong protective effect of attachment to their environment. Similarly, women who strongly prefer to stay, compared to those with a strong preference to leave, also show a robust negative association with depression, with a slight decrease in coefficient magnitude, but it remains significant at the 1% level. The magnitudes are larger for women than for men.

When comparing pooled OLS and fixed effects results, pooled OLS coefficients are generally larger, emphasizing that accounting for unobserved individual differences results in smaller but

still significant coefficients. The consistent negative associations for those with a strong preference to stay across both models suggest a robust relationship between location preferences and depression. Both men and women who strongly prefer to remain in their neighbourhoods tend to experience lower levels of depression. These findings highlight the importance of community ties in mental health. Aspects of social cohesion, such as strong neighbourhood attachment and supportive relationships within the community, play a critical role in fostering a sense of belonging and well-being (Putnam, 2000). These connections encourage people to stay in their locations and contribute to lower levels of depression. Social capital from community engagement enhances feelings of belonging and support, which can act as a buffer against depression, as engaged individuals are more likely to receive emotional support (Putnam, 2000; Berkman & Glass, 2000).

Examining the relationship between neighbourhood safety and depression reveals significant associations. Both genders show significant links between depression and neighbourhood violence. For men in low-crime, high-violence neighbourhoods, the coefficient decreases from 0.516 in the pooled OLS model to 0.456 in the fixed effects model, while for women, it drops from 0.377 to 0.364. This indicates that although neighbourhood violence significantly affects depression for both men and women, the relationship is somewhat diminished when accounting for individual fixed effects. Coefficients for "high crime, high violence" and “low crime, high violence” remain significant at the 1% level. Despite slight decreases with the addition of controls, significant depressive symptoms persist in high-violence neighbourhoods. These findings emphasize the significance of neighbourhood safety for mental health, particularly in high-violence areas.

Importance of religious activities has a highly gendered association with depression. Adding control variables primarily decreases the magnitudes of the pooled OLS coefficients, while increasing the fixed effects coefficients. Notably, the coefficient for "unimportant" rises from -0.407 (10% significance) to -0.437 for men (5% significance), suggesting a stronger negative association with depression. Meanwhile, the coefficients for "important" and "very important" decrease but remain significant at the 1% level, indicating their continued relevance even with controls. In contrast, the importance of religious activities shows no significant association with depression scores for women. The coefficients for "unimportant" and "important" shift slightly but lack statistical significance, indicating that demographic influences may weaken the perceived impact of religious activities. These results suggest that religious activities, as a

form of social participation, have a more significant impact on men's mental health in the African population, likely because men often serve as leaders in these contexts, thus benefiting more from the associated social capital (Abdel-Khalek, 2006; Koenig & Larson, 2001; Hodge & McGrew, 2007; Ellison & George, 1994; Bird, 2010)

The relationship between social trust (both personalized and generalized) and depression remains robust after adding control variables, with changes in the magnitudes of some coefficients but no alteration in the overall meaning of the results. For men in the pooled model, the coefficient for "very likely" personalized trust increases from 0.625 to 0.768, indicating a stronger positive association with higher depression levels after controlling for other factors. This suggests that men with strong personal trust in their neighbours may be more vulnerable to depression. For women, while the coefficient also increases, it remains insignificant, implying that personalized trust may not influence their depression in the same way. At the district level, both genders exhibit strong personalized trust but report significantly higher depression, potentially due to the community's overall lower trust in neighbours. In contrast, the cross-level interaction reveals that both genders experience lower depression levels, likely due to the buffering effects of broader social networks and positive community trust that supports mental health.

In terms of generalized trust, men’s pooled coefficients decrease slightly but remain significant at the 1% level, while women’s coefficients show only a minor increase, with no substantial changes in the cross-level interaction terms. These findings align with Adjaye-Gbewonyo et al., confirming that social trust is not universally beneficial for depression. Specifically, our results highlight that the relationship between higher personalized trust and lower depression scores in more trusting districts is primarily driven by men, as no significant cross-level interaction effect is observed for women.

The remaining variables are covariates that are expected to be associated with depression in both men and women and are discussed here in less detail. The impact of age on depression reveals contrasting trends. In the pooled OLS models, depression increases at a slightly increasing rate with age for both genders. However, the fixed effects model shows that depression may be U-shaped in age, with a small and insignificant negative coefficient for men (-0.094), and a stronger negative association for women (-0.291). The results indicate that older women may be less vulnerable to depression, at least until late in life. Thus, while aging might

protect against depression for some, it can also introduce vulnerabilities, especially among older individuals.

Being married has strong protective effects against depression compared to not being married, but the magnitude of the association is much larger for men than for women (-1.139 for men and -0.603 for women in pooled OLS). In the fixed effects model, the protective effect for men remains substantial and significant (-0.608), while for women, it diminishes to near zero, suggesting that marriage benefits men's mental health more than women's. Self-reported health status consistently correlates with depression across both genders, with better health linked to lower depression levels. In men, coefficients range from -1.146 for good health to -1.926 for excellent health, compared to those in fair or poor health. Although the fixed effects coefficients are slightly lower, they remain large and significant, highlighting the critical role of health in reducing depression, especially for men.

Childcare responsibilities show mixed results. In the pooled OLS model, both men (0.071) and women (0.089) exhibit positive coefficients, suggesting that childcare responsibilities may contribute to higher depression levels, although significantly so for women only. However, in the fixed effects model, men's effect drops to near zero (0.002), while women maintain a positive association (0.086) but it is no longer significant. The results are suggestive of childcare having a more substantial relationship with women's than men's mental health, in line with their much greater childcare responsibilities as shown in Chapter 3. Employment status is a crucial factor influencing depression. Compared to being economically inactive, both unemployed and employed individuals have significantly lower, depression scores. Both the pooled OLS and fixed effects models reflect the protective effect of employment against depression for both genders, even in these models that control for the household's expenditure level.

Education is significantly associated with depression in the pooled OLS estimation, but the patterns are inconsistent across education levels. For women, lower educational attainment, particularly incomplete secondary education, is linked to lower depression rates (-0.331). Conversely, for men, lower educational levels are associated with higher depression scores. Interestingly, both genders with tertiary education report higher depression levels compared to those with primary or no schooling. However, the fixed effects model shows that none of the education coefficients are statistically significant for either gender, likely due to the lack of variation in education levels over time for individuals. Living in urban areas, correlates with

higher depression rates for both genders, suggesting that urban living may introduce more stressors and mental health challenges compared to living rural areas, with a stronger effect on women. The fixed effects model shows slightly reduced coefficients, yet the pattern persists for women, highlighting urban areas as a significant risk factor for depression.

Household expenditure per capita demonstrates a protective effect against depression in the pooled OLS results, with coefficients of -0.071 for men and -0.073 for women. The fixed effects model shows a decrease in the magnitude for women (-0.031), but in general the findings highlight the importance of economic resources in mitigating depression risk for both genders. Being a main decision-maker in the household has no significant associations with depression, although the coefficients are consistently positive for men and negative for women. This suggests that women in decision-making roles may experience lower depression levels, potentially reflecting family structures in many African homes, where single women often lead households and take on primary decision-making responsibilities, fostering resilience and reducing depression (Mathews & Benatar's, 2021; Jones, 2022). Shared decision-making is associated with lower depression levels, particularly for women. The fixed effects model shows a weaker negative association for men (-0.129) but maintains a strong and statistically significant negative association for women (-0.234). This enforces the idea that joint decision-making is especially beneficial for women's mental health.

Finally, the survey wave results indicate that later waves generally correlate with increased depression in both models, perhaps reflecting changing societal conditions over time. The fixed effects model shows few significant differences in depression across waves, once unobserved heterogeneity is accounted for. This suggests that temporal factors significantly influence reported mental health outcomes, emphasizing the need for longitudinal analysis in understanding depression dynamics as this study has done. In general, the findings demonstrate robust consistency between the pooled and fixed effects estimation methods. However, fixed effects estimates are preferred because they mitigate the influence of time-invariant heterogeneity that may bias the pooled results. This focus on fixed effects paves the way for the next section, where we will compare the binary model specification of depression with results from the continuous linear model.

4.2.3 Comparing continuous and binary approaches to depression

In this section, the focus is on the comparing the results of the binary model specification of depression to the findings produced previously in the continuous linear model. In both cases,

the fixed effects approach will be used to address unobserved heterogeneity. The goal is to examine whether and how the relationship between social capital and mental health differs when depression is treated as a binary variable. By doing so, insights are gained into how various dimensions of social capital influence the likelihood or odds of experiencing depression, while controlling for important demographic and socioeconomic factors. The conditional logit model is utilized to explore this relationship, as it can incorporate panel weights in fixed effects estimation. The effective sample size is smaller in the logit model than the linear model, especially for men, because individuals whose depression status does not change across the waves are not included in the conditional logit estimation. This may introduce a form of sample selection bias, as individuals who are consistently depressed across all waves or who never experience depression are not included in the logit fixed effects model. Their exclusion is due to the lack of variation in the dependent variable, which is necessary for the estimation. Consequently, this could be influencing some of the differences observed between the logit and linear fixed effects results. Unlike the logit model, the linear fixed effects estimation does not suffer from this limitation, as it accounts for continuous changes in depression scores over time, allowing for a more comprehensive analysis of mental health dynamics. Additionally, as supported by Baron et al. (2017), the cut-off score of 12 is the most appropriate for assessing depression within this study's population. The first two columns of Table 4.3 reproduce the linear FE results from Table 4.2, for comparison purposes to the logit fixed effects estimates presented in the final two columns.

Table 4.3: Models for depression (binary indicator), including control variables, by gender

Depression **VARIABLES**	**Linear fixed effects Men**	**Linear fixed effects Women**	**Logit fixed effects Men**	**Logit fixed effects Women**
Location preference				
Moderate preference to leave	0.142	-0.227	0.086	0.008
	(0.299)	(0.257)	(0.182)	(0.146)
No preference	-0.228	-0.133	-0.197	-0.210
	(0.240)	(0.221)	(0.153)	(0.128)
Moderate preference to stay	-0.239	-0.454**	-0.223	-0.345***
	(0.232)	(0.221)	(0.151)	(0.124)
Strong preference to stay	-0.940***	-1.221***	-0.627***	-0.680***
	(0.214)	(0.197)	(0.132)	(0.109)
Neighbourhood safety				
High crime, low violence	-0.252*	-0.137	-0.119	0.010
	(0.139)	(0.118)	(0.106)	(0.079)

Depression **VARIABLES**	**Linear fixed effects** **Men**	**Linear fixed effects** **Women**	**Logit fixed effects** **Men**	**Logit fixed effects** **Women**
Low crime, high violence	0.456***	0.364***	0.148	0.265***
	(0.151)	(0.135)	(0.110)	(0.086)
High crime, high violence	0.506***	0.318**	0.287***	0.275***
	(0.154)	(0.135)	(0.106)	(0.082)
Importance of religious activities				
Unimportant	-0.431*	0.368	-0.212	0.119
	(0.229)	(0.364)	(0.152)	(0.225)
Important	-0.506***	0.079	-0.419***	-0.066
	(0.181)	(0.306)	(0.135)	(0.185)
Very important	-0.810***	-0.212	-0.419***	-0.129
	(0.192)	(0.308)	(0.144)	(0.186)
Trust of neighbours (personalized trust)				
Individual level				
Very likely	0.992***	0.476*	0.251	-0.017
	(0.363)	(0.285)	(0.271)	(0.195)
District level				
%Very likely	0.028***	0.021***	0.012**	0.003
	(0.007)	(0.006)	(0.006)	(0.004)
Cross-level interaction				
% Very likely*Very likely	-0.037**	-0.010	-0.028**	-0.001
	(0.017)	(0.014)	(0.013)	(0.009)
Trust of stranger (generalized trust)				
Individual level				
Very likely	1.684***	1.486***	0.764***	0.728***
	(0.359)	(0.290)	(0.208)	(0.160)
District level				
%Very likely	0.016*	0.008	0.006	0.004
	(0.008)	(0.007)	(0.007)	(0.005)
Cross-level interaction				
% Very likely*Very likely	-0.024	-0.004	0.011	0.005
	(0.022)	(0.018)	(0.012)	(0.010)
Age in years	-0.094	-0.291**	-0.078	-0.028
	(0.140)	(0.125)	(0.105)	(0.079)
Age Squared	-0.001***	-0.002***	-0.000	-0.001**
	(0.000)	(0.000)	(0.000)	(0.000)
Marital status				
Married	-0.608***	-0.100	-0.323*	-0.016
	(0.233)	(0.177)	(0.177)	(0.113)
Self-reported health status				
Good	-0.807***	-0.778***	-0.423***	-0.291***
	(0.213)	(0.146)	(0.127)	(0.087)
Very good	-1.245***	-1.164***	-0.769***	-0.569***
	(0.212)	(0.149)	(0.131)	(0.090)
Excellent	-1.537***	-1.428***	-0.758***	-0.472***

Depression VARIABLES	Linear fixed effects Men	Linear fixed effects Women	Logit fixed effects Men	Logit fixed effects Women
	(0.213)	(0.156)	(0.133)	(0.096)
Employment status				
Unemployed	-0.401***	-0.388***	-0.178	-0.194**
	(0.155)	(0.132)	(0.110)	(0.082)
Employed	-0.582***	-0.356***	-0.200*	-0.120
	(0.147)	(0.119)	(0.103)	(0.078)
Education				
Incomplete secondary education	0.015	-0.201	-0.137	-0.006
	(0.228)	(0.294)	(0.172)	(0.197)
Matric	0.200	0.368	0.262	0.132
	(0.333)	(0.372)	(0.261)	(0.264)
Tertiary education	0.059	0.188	0.036	-0.229
	(0.388)	(0.423)	(0.310)	(0.297)
Geographical area				
Urban	0.309	0.567**	0.049	0.303**
	(0.224)	(0.245)	(0.180)	(0.148)
Childcare	0.002	0.086*	0.104	0.020
	(0.139)	(0.051)	(0.103)	(0.030)
Household expenditure per capita in R'000	-0.065**	-0.031	0.008	0.011
	(0.026)	(0.028)	(0.017)	(0.018)
Makes main decisions				
Main decisions	0.184	-0.142	0.023	-0.081
	(0.148)	(0.114)	(0.103)	(0.076)
Makes joint decisions				
Joint decisions	-0.129	-0.234**	-0.071	-0.138**
	(0.123)	(0.100)	(0.101)	(0.069)
Waves				
Wave = 2	-0.583	-0.394	-0.216	-0.505**
	(0.370)	(0.315)	(0.280)	(0.197)
Wave = 3	-0.080	0.543	0.201	-0.027
	(0.609)	(0.527)	(0.459)	(0.331)
Wave = 4	0.524	1.500*	0.425	-0.039
	(0.946)	(0.826)	(0.720)	(0.523)
Wave = 5	1.102	2.613**	0.706	0.199
	(1.245)	(1.099)	(0.949)	(0.693)
Constant	13.572***	20.888***		
	(3.964)	(3.861)		
Observations	21,908	31,102	8,777	15,614
Number of pid	7,338	9,331	2,414	4,012
R-squared	0.0594	0.0905		
Pseudo R-squared			0.0674	0.0649

Source: National Income Dynamics Study 2008, waves 1-5, own calculations.

Notes: The sample includes all African adults aged 15 age and older. N = 28,000 individuals across and about 7,000 households. Data was collected from 2008 to 2020. The estimates are weighted. Robust standard

errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

The fixed effects logit estimates confirm the previous result of significant gender differences in how some aspects of social capital influence depression. Overall, the results are broadly similar to those obtained from the linear models, particularly in terms of the significance and direction of key variables. However, the binary model exhibits fewer significant relationships, especially for men. Specifically, a strong preference to stay within one's social environment is associated with significantly lower probabilities of depression for both genders compared to those with a strong preference to leave. Women with a moderate preference to stay also have a significantly reduced probability of depression. Stronger neighbourhood attachment leads to even greater reductions in the probability of depression, indicating that women may be particularly sensitive to their location's emotional implications.

Neighbourhood safety is a critical factor influencing mental health, with both genders experiencing increased depression in high-crime, high-violence areas across both the linear and logit models. Overall, the results are broadly similar, reinforcing consistent patterns observed in the analyses. The linear model highlights how feeling safe acts as a protective factor for men, while the logit model highlights the harmful impact of violence, especially for women. This suggests that the models emphasize related but distinct aspects of how neighbourhood safety affects mental health.

The liner and logit models largely confirm the previous findings regarding the importance of religious activities. Men who consider religious activities important experience significantly lower levels of depression compared to those who do not. In contrast, the importance of religious activities does not appear to be associated with depression in women. This indicates that strong religious commitment, serving as a proxy for social participation, acts as a protective factor for men’s mental health.

Trust in neighbours exhibits the largest differences between the linear and logit fixed effects models. There are no longer any significant associations between personalized trust and depression for both men and women in the logit model. In the linear model, men who trust their neighbours show an increase of 0.992 in depressive symptoms, while the logit model indicates a positive coefficient of 0.251 for the same trust. For women, the association is weaker, with a 0.476 increase in depressive symptoms in the linear model, and a decrease in the logit model

with significant relationship, indicating that women's trust in neighbours does not correlate with depression.

At the district level, both models reveal significant but smaller coefficients, suggesting that higher district-level trust serves as an additional buffer against depression. Notably, as district-level trust approaches zero, individual trust has no association with the likelihood of depression for either gender. For men, living in a district with higher trust when they themselves are not trusting is linked to a greater probability of depression. The cross-level interaction indicates that as district trust increases, the likelihood of depression decreases for men who trust their neighbours.

The results for generalized trust in the logit model are largely the same as for the linear model, which was not the case for personalized trust. Both models reveal large and significant coefficients for both genders. The results for trust of strangers in the binary model confirm the findings of the linear specification. Individuals who are very likely to trust a stranger have a significantly higher likelihood of depression. The district level of trust has no insignificant association with depression, either independently or as a cross-level interaction.

Age has a weaker link to depression in the logit model than in the linear model, with older people showing different patterns in depressive symptoms. Married men are less likely to be depressed, but this isn’t true for women. Better self-reported health is associated with lower depression for both genders, especially for men. Unemployment raises the likelihood of depression for both, but this effect is less noticeable in the logit model compared to the linear model. Childcare responsibilities don’t show a significant link to depression for either gender in the logit model, while the linear model found a positive connection for women. Living in urban areas is linked to increased depression for women in the fixed effects model, but this isn't as clear in the logit model. Lastly, shared decision-making seems to help reduce depressive symptoms for both genders, indicating that decision-making roles affect mental health differently across the models.

The results from Table 4.3 demonstrate that the linear model, which treats depression as a continuous variable, is more effective than the logit model in capturing the nuances of depressive symptoms. The binary nature of the logit model simplifies depression to a yes/no status, which limits its ability to measure the extent of symptoms. Interestingly, the logit model shows stronger effectiveness for women, particularly regarding joint decision-making, urban

living, and age effects. However, it has two main drawbacks: first, it fails to capture the varying degrees of depression, and second, it analyses a smaller sample size because individuals with a consistent depression status are excluded from the fixed effects model. This leads to fewer significant coefficients, especially for men, making it difficult to identify meaningful relationships for several variables that are, in fact, associated with depression scores.

In contrast, the linear model is better suited for capturing individual variability and provides more dynamic insights, particularly for women. Thus, a model that treats depression as a continuous variable, such as the linear fixed effects model, is more effective than a binary variable model like the conditional logit model, as it better captures the nuanced dynamics of depressive symptoms.

4.3 Discussion

The findings regarding social capital highlight a nuanced relationship with mental health outcomes across genders. Neighbourhood attachment emerged as a protective factor, particularly for women, who experience lower levels of depression when they prefer to remain in their current location. This result aligns with social cohesion theory, which posits that a strong attachment to one's community can act as a protective factor against mental health issues (Wilkinson & Pickett, 2009). As noted in literature by Myroniuk (2016) and Jones (2022), women derive greater emotional benefits from neighbourhood stability, and typically have stronger bonding capital, possibly due to the social roles they often fulfil within communities.

Residing in high-crime areas is associated with increased depression, with men being more affected than women, echoing findings by Tsaneva and LaPlante (2024) that emphasize men's vulnerability as primary victims of crime in South Africa. This reinforces the significant mental health impacts of environmental factors, consistent with studies noting the adverse effects of neighbourhood violence (Adjaye-Gbewonyo et al., 2018).

Engagement in religious or communal activities proves beneficial for men’s mental health, providing essential emotional support, a finding supported by Holt-Lunstad et al. (2010). This highlights that, while men may have fewer social participation avenues, such activities play a crucial role in their mental well-being. In contrast, scholars like Berkman & Glass (2000) and Mathews & Benatar (2021) argue that women may derive support from a broader array of social networks, such as involvement in informal networks or caregiving roles, making religious involvement less central for them.

Finally, the relationship between social trust and mental health reveals complexity; greater trust in neighbours does not necessarily correlate with better mental health outcomes, but when people share similar levels of trust, it has a bigger association for men. This suggests that while trusting can provide a sense of emotional safety and security, the context and quality of trust are critical, especially in a diverse and unequal setting like South Africa, as highlighted by Adjaye-Gbewonyo et al. (2018). The stronger trust affects relationship for men than women shows that men and women interact differently in their communities, and these differences can impact mental health. Overall, these findings highlight the multifaceted nature of social capital and its varying links to mental health, which are also gender specific.

4.4 Limitations

This study analyses secondary data, and therefore the primary limitation involves the availability of variables. Certain questions relating to social capital were not asked in all five waves of the NIDS dataset. The analysis is limited by the inconsistent measurement of key social capital variables across the five waves of the NIDS dataset. Specifically, questions related to neighbourhood support (D33), communal group membership (M9), business support (E52), and racial trust (M14) were not consistently included in every wave of data collection, preventing a comprehensive assessment of these dimensions of social capital. Without consistent and comprehensive social capital variables in all waves of the dataset, it is difficult to track changes in social capital indicators, explore causal relationships, and draw robust conclusions about the association between social capital and depression (Putnam, 2000).

Moreover, the absence and inconsistency of some social capital variables in the dataset across the waves limits the studies capacity to capture the multidimensional aspects of social capital that may influence mental health outcomes. Social capital encompasses various dimensions, such as social networks, social support, social trust, community participation, and interpersonal relationships, each of which can play a distinct role in shaping individuals' mental well-being (Coleman, 1988; Lin, 2001). However, the NIDS data lack information about specific dimensions such as social cohesion, community participation, informal social networks, and the nature of interpersonal relationships. Additionally, it does not provide details on community-level trust, the impact of voluntary organizations, or the role of social activities in enhancing social capital. These gaps hinder a comprehensive understanding of how various aspects of social capital contribute to mental health outcomes.

Nonetheless, the study was able to include five measures of social capital, which capture aspects of three dimensions: social cohesion, social participation, and social trust. Without a comprehensive set of social capital variables, the study may fail to capture the nuances and complexities of how different aspects of social capital impact depression, leading to a partial and potentially skewed understanding of the relationship between social capital and mental health (Kawachi & Berkman, 2000). One potential reason why the results for trust may not align with expectations could be the limitations of the social trust indicators utilized. Specifically, the measure of social trust based on respondents' beliefs about the likelihood of a lost wallet containing R200 being returned by a neighbour or a stranger may not fully capture the multifaceted nature of social trust.

Research by Posel and Hinks (2011) highlights that responses to such hypothetical scenarios can vary significantly based on individual perceptions and contextual factors, potentially leading to measurement inaccuracies. They found that reported levels of trust are generally low in South Africa, with individuals more likely to trust neighbours than strangers. However, these responses are influenced by various factors, including personal experiences and societal context, which may not be fully accounted for in the survey question. Furthermore, the study by Adjaye-Gbewonyo et al. (2018) suggests that the specific measure of trust used in the NIDS may not capture the same aspects of trust as other measures used in social trust research. This discrepancy could lead to challenges in interpreting the association between social trust and depression. These insights indicate that the social trust indicators employed may not comprehensively reflect the construct of trust as intended. Consequently, the findings related to social trust and its association with depression should be interpreted with caution, acknowledging that the measurement tool may not fully encapsulate the complexity of social trust dynamics within the South African context.

These limitations constrain the study of the relationship between social capital and mental health to some extent. While certain aspects of social capital can be measured, not all are captured. This gap can prevent a comprehensive understanding of how different elements of social capital influence mental health. Consequently, understanding the relationship between social capital and mental health becomes more difficult.

4.5 Conclusion

This chapter presented the econometric strategy of the dissertation and conducted a comprehensive regression analysis. The results were organized across several tables, each

focusing on different aspects of the varying model specifications. The results revealed notable differences in coefficients and significance levels, indicating how various factors influence depression differently depending on the model used. In addition, the results revealed gender differences in the roles of various factors.

First, simple models were estimated that accounted for the social capital variables but omitted other controls, using the pooled OLS and Fixed Effects estimators. The results highlighted that higher levels of social capital generally correlate with better mental health outcomes. A second table expanded the depression model by incorporating demographic and socioeconomic variables, providing deeper insights into factors influencing mental health outcomes. Adding these controls generally weakened associations between social capital and depression, although many variables retained significance. A strong preference to stay significantly reduced depression levels, particularly for women. Neighbourhood safety emerged as a critical factor, with high-violence neighbourhoods linked to increased depressive symptoms. The importance of religious activities was protective for men but not women, while personalized and generalized trust presented a complex dynamic, surprisingly correlating with increased depression for individuals living in low-trust districts. Interaction effects showed that district-level trust could mitigate some negative associations of personalized trust with mental health for men.

A final set of estimates compared to the measurement of depression as a binary variable, using conditional logit estimation, to the continuous linear models used previously. Overall, the linear model is more effective for capturing varying levels of depression, providing a detailed understanding of symptoms instead of merely categorizing them as yes or no. While the logit model shows better performance for women in aspects like joint decision-making and urban living, it oversimplifies depression and uses a smaller sample by excluding individuals with consistent depression status. This can limit significant findings, particularly for men. In contrast, the linear model reflects individual differences more accurately and offers deeper insights, especially for women. Ultimately, a continuous approach to measuring depression presents a more comprehensive view of its complexities than a binary method.

Chapter 5: Conclusion

5.1 Introduction

Mental health has increasingly been recognized as an important component of overall well-being, with more evidence showing how it affects people's quality of life. Social capital has been found to help improve and protect mental health. Having strong social ties can lead to better mental health outcomes by providing support and fostering a sense of belonging (Kawachi & Berkman, 2001). However, research indicates that women often experience poorer mental health compared to men across various types of studies and contexts (Kessler et al., 1994; Chola and Alaba, 2013; Platt et al., 2020). This gender difference in mental health is particularly prominent in developing countries (World Health Organization, 2017), where there is still limited research on how mental health is influenced by demographic and socio-economic factors. In particular, existing research in South Africa has failed to account for possible gender differences in the relationship between social capital and mental health.

To address this knowledge gap, this study explored how the relationship between different aspects of social capital, such as social cohesion (measured through factors like location preference and neighbourhood safety), social participation (assessed by the importance of religious activities), and social trust (measured by trust in neighbours and strangers), varied between men and women. The findings provide valuable insights into how social networks, social support and community involvement influence mental health, for both genders (Kessler, 2003).

The dissertation used a range of theoretical frameworks on mental health and social capital to motivate for gender differences in the relationship between social capital and mental health, as well as the roles of other socioeconomic factors. The literature gave some background understanding and laid out the various perspectives that attempt to explain why women are disproportionately affected by depressive symptoms compared to men. The biomedical, psychological, and social models explain how depressive symptoms arise through genetic, hormonal, and psychological factors (Kendler et al., 1999; Nolen-Hoeksema, 1987), while societal expectations, gender norms, and experiences contribute to gender differences in mental health (Hammarström et al., 2009; Meaney & Szyf, 2005). The empirical literature consistently shows that social capital is linked to mental health outcomes, with strong social networks and community trust associated with better mental health, including lower rates of depression

(Kawachi et al., 2019; Lund et al., 2018). However, the relationship is complex, with factors like age, gender, and socio-economic conditions influencing how social capital impacts mental health (Peltzer et al., 2014; Abrams & Mehta, 2019).

This study addressed three key questions: first, exploring gender differences in social capital and mental health, given that women may experience higher depression rates despite similar or stronger social networks (Kawachi et al., 2019); second, examining how the relationship between social capital and mental health varies by gender, considering the different social roles and vulnerabilities of men and women (Peltzer et al., 2014); and third, assessing whether the relationship between social capital and mental health depends on how mental health is measured, given the variety of approaches, such as a continuum or as a binary indicator (Abrams & Mehta, 2019).

5.2 Key findings

The empirical analysis conducted in this study used five waves of longitudinal data from NIDS to address three research questions about social capital and mental health in South Africa. The first research question, *"*how do levels of social capital and mental health compare between men and women in South Africa?" was answered through a descriptive analysis of gender-specific patterns in depression and social capital, presented in Chapter 3. The descriptive statistics showed that women have higher average depression scores than men, using the ten-item CES-D score as a measure of depression. Depression persistence, measured longitudinally using a binary indicator, is also higher for women than for men, although both genders have high probabilities of transitioning out of depression over time. Women have higher levels of social capital than men for some measures, including a stronger attachment to their neighbourhood. In contrast, men assign greater importance to religious activities than women and are more likely to live in communities where, on average, trust is higher.

In the literature, these social capital factors are typically associated with better mental health (Putnam, 2000; Lin, 2001; Kawachi & Berkman, 2001; Subramanian et al., 2005; Lund et al., 2018; Kawachi et al., 2019). Therefore, the descriptive analysis showed that both social capital and mental health outcomes vary significantly by gender, but it suggested a possible empirical puzzle in that women's greater levels of social capital than men occur alongside their poorer mental health.

The second research question *"*how does the relationship between various aspects of social capital and mental health differ between men and women in South Africa?" was addressed in Chapter 4 by examining the differential association of social capital indicators such as location preference, neighbourhood safety, religious participation, and social trust on mental health by gender. To achieve this, the study used two regression approaches: pooled OLS and fixed effects estimation. Each model estimated the complex interplay between social capital and depression, while controlling for other important covariates, such as demographic and socioeconomic variables.

The findings suggested that individual-level trust, the importance of religious activities, and neighbourhood safety are significant predictors of depression, even after controlling for other individual-level characteristics. In addition, the relationship varied by gender in several keyways. For women, neighbourhood attachment and community stability serve as key protective factors against depression, while men's mental health is more significantly related to religious participation. Trusting neighbours or strangers more is linked to higher levels of depression for both men and women. However, the association between trust and depression changes at the community or district level. People living in communities or districts where average trust is low are likely to be depressed. But in communities or districts where trust is higher, both men and women tend to experience less depression.

The third and final research question, *"*to what extent does the estimated relationship depend on how mental health is measured?" was answered by contrasting different regression approaches. In particular, the results for the continuous depression score were compared to those produced for a binary depression indicator, using a logit fixed effects model. The study showed that the relationship between social capital and mental health did not significantly alter when varying these approaches but doing so provided a more nuanced understanding of the underlying relationships. The binary logit model identified fewer significant relationships, particularly for men, and failed to account for the intensity of depressive symptoms, while the continuous linear model offered more detailed insights, revealing how social capital factors like neighbourhood attachment and safety are associated with mental health. The logit model's smaller sample size, excluding individuals with a stable depression status, further limited its effectiveness. Overall, the continuous model better captured the complexity of mental health and gender differences, highlighting how the method of measuring depression influenced the observed relationships with social capital.

This study has several limitations that should be considered when interpreting the results. One key limitation was the restricted availability and consistency of variables. Specifically, certain social capital questions were not included in all five waves of the NIDS dataset, limiting the ability to track changes in social capital and assess its full impact on mental health over time. The inconsistent measurement of key social capital variables, such as neighbourhood support, communal group membership, and racial trust, hinders a comprehensive understanding of these dimensions and their relationship with depression. Additionally, the NIDS dataset lacks information on several important aspects of social capital, including social cohesion, community participation, informal social networks, and the nature of interpersonal relationships, which are all crucial for understanding mental health outcomes (Coleman, 1988; Lin, 2001).

While fixed effects were used to address unobserved heterogeneity, it was not possible to control for all potential confounding factors, so the results should be interpreted as associations rather than causal relationships. Another limitation is related to attrition. Although panel weights were applied to adjust for non-response and attrition, there is still a possibility of non-random attrition, such as those with poorer mental health being more likely to drop out, which could bias the findings. These limitations prevent the study from offering a fully comprehensive picture of the relationship between social capital and mental health.

5.3 Significance of the study

The findings produced in this dissertation offer valuable insights into how various aspects of social capital are associated with depression for men and women in South Africa. This study contributes to the field by providing nuanced insights into the gender differences in depression, particularly in the context of a developing country. While existing literature has identified higher rates of depression among women (Kessler et al., 2003; Platt et al., 2020), this study delved deeper into some of the possible mechanisms behind these differences, exploring how factors such as location preference, neighbourhood safety, religious participation, and social trust differentially affect men and women. The nuanced perspective brought through by this study contributes to the literature by challenging oversimplified views of social capital as uniformly beneficial, suggesting that its role may vary significantly across different contexts and demographic groups.

The findings of this study contribute to our understanding of how different aspects of social capital relate to mental health, particularly in a South African context. One notable finding concerns the role of religious activities in mental health. Religious participation was found to be associated with better mental health for men but not for women. This suggests that the emotional support and sense of community provided by religious or communal activities may be more significant for men, who might have fewer alternative channels for social interaction and participation in society (Berkman & Glass, 2000). Additionally, traditional religious structures often position men in roles of authority and leadership, which could enhance their sense of purpose and belonging within these communities. This empowerment may further contribute to the positive impact of religious involvement on men's mental health.

For women, other forms of social engagement, such as family or work-related networks, may provide similar or stronger support (Thoits, 2011), which could explain why religious involvement does not show the same positive association with their mental health. The additional support gained through religious participation may not significantly enhance their mental health beyond what they already receive from other relationships. Additionally, women may encounter limitations within religious institutions that restrict their roles, potentially diminishing the mental health benefits they might otherwise obtain from participation. This speculation opens up new avenues for further research into gender-specific social structures and their impact on mental well-being (Walen & Lachman, 2000).

Cross-sectional studies that included the group membership question M9 have yielded mixed findings regarding its association with mental health outcomes. Tomita and Burns (2013) found no significant relationship between civic participation (a form of structural social capital) and depression in South Africa, aligning with a systematic review of international studies by De Silva (2006), which suggested that structural social capital may not always have a positive impact on mental health. Similarly, Mitchell and LaGory (2002) and Veenstra (2005) also reported no effect of civic participation on depression outcomes. In contrast, Lau and Ataguba (2013) found that membership in a community service group was associated with better health, indicating that both structural and cognitive components of social capital contribute positively to self-rated health. Additionally, Posel and Hinks (2011) observed that trust in neighbours increased with group membership, alongside other factors such as employment stability and engagement in religious activities.

These findings suggest that while group membership may not universally benefit mental health, it could play a role in fostering trust and social support. It is also possible that community participation might be more beneficial for women than religious involvement alone. However, since the M9 question was not consistent in all waves of the NIDS dataset, this study was unable to assess its potential impact on mental health over time.

The study's findings on social trust align with recent literature, revealing that individuals with higher levels of social trust are more likely to experience depression, contrary to what might be expected (Cohen-Cline et al., 2015; Lin et al., 2018). This study further shows that, for men, high trust in neighbours is linked to worse mental health when community-level trust is low, supporting Adjaye-Gbewonyo et al.'s (2018) finding but adding a gendered nuance. This result suggests that social trust may not always act as a protective factor, especially in environments where broader community trust is weak, highlighting the complex nature of social capital's influence on mental health. These findings challenge the conventional view that higher trust always leads to better mental health, offering a more nuanced perspective that highlights the importance of contextual factors in shaping the relationship between social capital and mental well-being.

This study reinforces the critical role of social capital in promoting health and well-being, particularly in materially deprived communities like many in South Africa, where access to formal mental health resources is often limited. By strengthening key aspects of social support, targeted interventions can improve mental health outcomes and highlight the need for policy frameworks that leverage social networks to enhance community well-being. However, the concept of social capital is not without its limitations. As Fine and Lapavitsas (2004) argue, the notion of social capital can sometimes be overly simplistic, failing to account for structural inequalities that shape access to resources and social support.

Future research should continue to explore how social capital evolves and influences mental health across diverse socioeconomic and cultural contexts, particularly in light of its potential to substitute for financial capital in buffering against life's shocks (Kawachi et al., 2008). The substitutability between social capital, financial capital, and human capital, especially in contexts of financial instability, emerges as an important area for further research. Additionally, designing neighbourhoods that facilitate the development of social capital may serve as an innovative policy intervention to foster long-term community resilience. This work lays the foundation for future research to explore these intricate dynamics, ultimately contributing to a

more nuanced understanding of how social capital can be strategically harnessed to promote mental health in vulnerable populations.

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