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Social determinants of psychological distress in a nationally-representative sample of South African adults☆

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Abstract

There is substantial evidence from developed countries that lower socioeconomic status (SES) is associated with increased occurrence of mental illness, and growing interest in the role of social support and social capital in mental health. However, there are few data on social determinants of mental health from low- and middle-income nations. We examined the association between psychological distress and SES, social support and bonding social capital in a nationally-representative sample of South African adults. As part of a national survey of mental health, a probability sample of 4351 individuals was interviewed between 2002 and 2004. Non-specific psychological distress was measured using the Kessler K-10 scale. SES was assessed from an aggregate of household income, individual educational and employment status, and household material and financial resources. Social support, bonding social capital and traumatic life events were measured using multi-item scales. The mean age in the sample was 37 years and 76% of participants were black African. Measures of SES and social capital were inversely associated ($p < 0.001$). Both recent and traumatic life events were more common among individuals with low levels of SES and social support. After adjusting for participant demographic characteristics and life events, high levels of psychological distress were most common among individuals with lower levels of SES and social capital. There was no independent association between levels of social support and psychological distress. The occurrence of recent life events appeared to partially mediate the association between SES and psychological distress ($p = 0.035$) but not the association involving social capital ($p = 0.40$). These data demonstrate persistent associations between levels of SES, social capital and psychological distress in South Africa. The increased frequency of recent life events appears to only partially explain higher levels of psychological distress among individuals of lower SES. Additional research is required to understand the temporality of this association as well as mechanisms through which SES and social capital influence mental health

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in low- and middle-income settings where high levels of poverty and trauma may contribute to excess burden of mental illness.

Keywords

Psychological distress; Mental health; Socioeconomic status (SES); Social support; Social capital; South Africa

Introduction

The study of social factors, and socioeconomic status (SES) in particular, as determinants of mental health has a long history in psychiatric epidemiology. Throughout the 20th century, epidemiological research investigating the distribution of mental health in European and North American populations found an increased burden of disease in groups of lower SES (Faris & Dunham, 1939; Hollingshead & Redlich, 1958; Kesser, 1982). Today, there is general consensus that SES plays a significant role in the aetiology of depression, through mechanisms of both increased individual vulnerability and reduced access to protective resources (Muntaner, Eaton, Miech, & O'Campo, 2004). Prospective studies from Britain (Power, Stansfeld, Matthews, Manor, & Hope, 2002) and the United States (Johnson, Cohen, Dohrenwend, Link, & Brooks, 1999) have found the incidence of depression higher among individuals of lower SES, and meta-analysis has suggested that individuals from the lowest socioeconomic stratum of society are at 1.5–2.0 times the risk of a major depressive episode compared to individuals from the highest socioeconomic stratum (Lorant et al., 2003). There is less evidence regarding the association between SES and different anxiety disorders (Muntaner et al., 2004). Multiple studies have suggested that anxiety disorders may be more common in groups of low socioeconomic status, including post-traumatic stress disorder, generalized anxiety disorder and different phobias (Eaton, Kessler, Wittchen, & Magee, 1994; Foa, Stein, & McFarlane, 2006; Magee, Eaton, Wittchen, McGonagle, & Kessler, 1996; Wittchen, Zhao, Kessler, & Eaton, 1994). However, much of the data on this question come from cross-sectional studies and the selection-causation issue remains unresolved.

While the role of SES in shaping the population mental health is widely recognized, the possible role of other social factors is less well understood. There is evidence to suggest that individual social networks may decrease individual susceptibility to anxiety and depression (Kawachi & Berkman, 2001; Kendler, Myers, & Prescott, 2005; Kessler, Kendler, Heath, Neale, & Eaves, 1992). More recently, the concept of social capital has become popular in mental health research with several studies suggesting that there may be qualities of communities and neighborhoods that contribute to the aetiology or prevention of common mental illnesses (Almedom, 2005), although any causal relationship is likely to be highly context-specific (Caughy, O'Campo, & Muntaner, 2003). Again, insight into these issues comes almost exclusively from high-income countries. One study of women in Lusaka, Zambia and Durban, South Africa suggested that membership in community groups (in this study, primarily church groups) was associated with better self-rated mental health, although adjustments for individual socioeconomic position are not reported (Thomas, 2006). Furthermore, there have been few studies examining the influence of social networks and/or social capital on mental health after adjustment for measures of socioeconomic status; given the potential interrelationships between these constructs, failure to account for their covariance may lead to an overestimation of the association between any one social determinant and mental health outcomes.

Evidence for the association between mental health and SES or other social determinants comes largely from developed countries (Patel, 2001). Several cross-sectional studies have demonstrated associations between different measures of mental health and various markers of socioeconomic status (Patel, Araya, de Lima, Ludermir, & Todd, 1999; Patel & Kleinman, 2003), although few studies have had access to comprehensive measures of SES. One of the only prospective studies of this association conducted to date found that household income was a persistent predictor of incident common mental disorders during 12 months of follow-up of Indian women (Patel, Kirkwood, Pednekar, Weiss, & Mabey, 2006). And, while there are few data on the population prevalence of mental disorders in developing countries, their public health burden is likely to be substantial (WHO, 2001). The focus of research on the social determinants of mental health on high-income countries is part of a broader neglect of mental illness as a public health issue in many low- and middle-income countries (Saraceno et al., 2007). Compared to high-income countries, low- and middle-income countries may have different prevalences of mental disorders (Demyttenaere et al., 2004), as well as different socio-cultural systems and population levels of SES; together, these may point to differences in the major aetiologies of common mental disorders. For instance, one comparison of depression and anxiety levels among women living in Harare, Zimbabwe and London, England suggested that the strength of association between specific types of life events and mental disorders differed in the two countries (Broadhead & Abas, 1998), suggesting that the social determinants of mental health may vary between developed and developing countries.

Despite the importance of social factors, and socioeconomic status in particular, as determinants of mental health, there have been few population-based studies of the social determinants of mental health in developing country settings. To address this gap, we examined the social determinants of non-specific psychological distress in a nationally-representative sample of South African adults. We hypothesized that decreased levels of socioeconomic status, social networks and social capital would each be associated with increased levels of psychological distress, independent of individual demographic characteristics. In addition, we examined the possibility that the associations between each social determinant and psychological distress are explained by increased exposure to negative life events: that individuals of lower socioeconomic status, social networks and/or social capital would be more likely to be exposed to life events, in turn causing them increased psychological distress.

Methods

The South African Stress and Health (SASH) study is a national survey of mental health conducted between January 2002 and June 2004. The study rationale and methods have been described in detail previously (Williams et al., 2004). The survey protocol, including all recruitment, consent and field procedures, was approved by the Human Subjects Committees of the University of Michigan, Harvard Medical School, and by a single project assurance of compliance from the Medical University of South Africa that was approved by the National Institute of Mental Health (USA).

Sampling

A probability sample of South African adults was selected using three-stage design. First, the Enumerator Areas (EAs; a unit of census administration of which there are approximately 85,000 in the country) used in the 2001 national census were stratified according to province, location (rural/urban) and majority population group (African, coloured, white or Indian); 960 EAs were selected from the resulting strata, with the number of EAs selected per stratum proportional to the estimated stratum population (minimum 1; maximum 85). Second, within each enumerator area a random sample of five households

was selected. Third, within each household, a single adult was selected to participate using the Kish procedure for objective respondent selection (Kish, 1949). Fieldworkers made up to three attempts to contact selected participants. The overall response rate for the study was 85.5%, and the final sample size was 4351 individuals.

Measures

Interviews were conducted by fieldworkers with special training in psychiatric interviewing working in one of six local languages. Interviews lasted approximately 3 h and sometimes took place over multiple home visits. Participant demographic characteristics, including age, gender, rural/urban location, and marital status, were investigated using standard questionnaire items; race was self-defined by participants. Both location and race are likely to capture variation in socioeconomic position in South Africa. Residents of rural areas have typically had less access to education, services, employment and formal economic structures compared to individuals living in urban centres. The construct of racial groupings has been used as a formal guide to allocate political and economic opportunity in South Africa historically, with individuals of European ancestry (whites) the most favored and black Africans the most discriminated against (here we differentiate between indigenous black Africans, coloureds, whites and Indians, on the basis of historical classification systems).

The Kessler K-10 scale was used to measure global psychological distress, including significant pathology which does not meet formal criteria for a psychiatric illness (Kessler et al., 2002; Kessler et al., 2003). This scale measures the following symptoms over the preceding 30 days by asking: “In the past 30 days, how often did you feel: nervous; so nervous that nothing could calm you down; hopeless; restless or fidgety; so restless that you could not sit still; depressed; that everything was an effort; so sad that nothing could cheer you up; worthless; tired out for no good reason?” The frequency with which each of these items was experienced was recorded using a five-point likert scale ranging from “none of the time” to “all the time”. This score was then summed with increasing scores reflecting an increasing degree of psychological distress. The K-10 has been shown to capture variability related to non-specific depression, anxiety and substance abuse, but does not measure suicidality or psychoses (Brooks, Beard, & Steel, 2006). This scale serves to identify individuals who are likely to meet formal definitions for anxiety and/or depressive disorders, as well as to identify individuals with sub-clinical illness who may not meet formal definitions for a specific disorder (Kessler et al., 2002). This scale is increasingly used in population mental health research and has been validated in multiple settings (Andrews & Slade, 2001). We examined the K-10 scale using ordinal categories for low, moderate, high and very high psychological distress (scores of 10–19, 20–24, 25–29 and ≥30, respectively) and as a binary variable comparing scores of 0–29 versus ≥30. The K-10 scale was strongly predictive of both anxiety and depressive disorders (as defined by the Diagnostic and Statistical Manual, Fourth Edition, and measured using the World Health Organization Composite International Diagnostic Interview Version 3.0 [Kessler & Ustun, 2004]), including agoraphobia, post-traumatic stress disorder, panic disorder, social phobia, generalized anxiety disorder, as well as minor and major depressive disorders ($p < 0.0001$ for all associations).

The measurement of recent life events was based on the Life Event schedule of the World Mental Health Survey. This investigated events during the previous 12 months in 13 areas based on whether the participant had experienced (1) illness or injury; (2) physical attack; (3) robbery; (4) death of someone close; (5) separation from spouse or partner; (6) end of another close relationship; (7) being fired from a job; (8) retiring from a job against the participant’s will; (9) losing a job for another reason; (10) searching for employment without success for over a month; (11) major financial crisis; (12) problems with the police; or (13) whether someone close to the participant had experienced illness, injury or physical attack.

Lifetime experience of trauma was measured through 28 items used to screen for post-traumatic stress disorder in the World Mental Health survey, including experiences of accidents, illness, loss of loved ones, abuse, crime, war and natural disasters. Recent and lifetime traumatic life event were categorized into ordinal variables of none, 1–2, 3–4 and 5 or more life events.

Socioeconomic status was investigated using estimated household income, years of participant education, and participant employment. Because these traditional markers of socioeconomic status may not adequately capture variation in socioeconomic position in developing country settings where there is a substantial informal economy and resource sharing is common (particularly in rural areas where bartering of goods and services may act in the place of income-based wealth) (Myer, Ehrlich, & Susser, 2004), we used an asset index based on 17 items reflecting individual and household wealth. This was based on: household ownership of appliances (refrigerator/freezer; vacuum/floor cleaner; television; video cassette recorder; radio; microwave; and washing machine), other household resources (telephone; running water in the home; kitchen sink; flush toilet; automobile; domestic servant; and stove/hot-plate) and financial activities which participants engaged in (shopping at a supermarket; using financial services such as a bank account or credit card; and having an account at a retail store). This index demonstrated excellent reliability (Cronbach's α = 0.92). The measures of asset ownership were used to construct an aggregate asset score, which was categorized into categories for 0–5, 6–12 and 13–17 assets.

In addition to reporting measures of SES (participant income, education, employment and asset index) individually, we standardized the raw income, education and asset index values, then summed them to create an aggregate measure of SES. This standardized measure was divided into tertiles for analysis corresponding to low, moderate and high SES.

The construct of social support was based on five items in the social networks section of the World Mental Health survey schedule. These included items capturing aspects of social support (based on the frequency of contacts with family and friends other than those who are living together) as well as emotional support measures (based on the ability to rely on family or friends if the participant had a problem, the ability of participants to open up to their family or friends, and having someone with whom participants could share private feelings and concerns) (Table 1). These items were summed to form an aggregate scale in which each item received equal weighting. This scale was divided into tertiles to reflect low, moderate and high levels of social support.

We examined the bonding form of social capital at the individual level using on four items from the National Survey of American Life (Jackson et al., 2004), which were adapted to the South African context. These were: (1) how often participants spend time with their neighbours (a structural measure reflecting community cohesiveness); (2) participants' perceptions of crime in the area (a cognitive measure of social trust); (3) whether the participant knows of local civic groups (such as social clubs or community associations) (a cognitive measure of community cohesiveness); and (4) whether the participant is a member of any such community group (a structural measure of community cohesiveness) (Table 1). These items were recoded so that higher scores (including lower levels of crime) contributed to higher levels of bonding social capital, and then summed to form an aggregate scale in which each item received equal weighting. This scale was divided into tertiles to reflect low, moderate and high levels of bonding social capital.

Analysis

Data were analysed using Stata Version 9.2 (Stata Corporation, College Station, USA). All analyses accounted for the complex survey design using person-level weights that incorporated sample selection, non-response and post-stratification factors. Calculations for estimation and inference were based on the Taylor series linearization method. We examined the crude associations between psychological distress (dependent variable) and participants' life events, socioeconomic status, social support and social capital (independent variables) using Pearson's chi-squared test for comparison of proportions and a corrected *t*-test for comparison of means. All statistical tests are two-sided at $\alpha = 0.05$.

We developed a series of multiple logistic regression models to examine the independent effects of recent traumatic life events, socioeconomic status, social support and social capital on psychological distress. The first series of models examined separately the crude associations between the different social constructs (SES, social support and social capital) and psychological distress. Following this we examined each social construct separately, but adjusted for participant demographic characteristics (age, rural/urban location, race, and gender). We then included all the social constructs in a single model with demographic variables, to determine their independent associations. Finally, we added recent and lifetime negative life events to the latter model, in order to examine the potential for mediation of the association between any of social constructs and the prevalence of psychological distress (Susser, Schwartz, Morabia, & Bromet, 2006). Mediation was formally assessed using the Aroian test based on the analysis of the continuous, standardized social construct scales (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002; Shrout & Bolger, 2002). Potential heterogeneity in associations with demographic characteristics and social constructs was examined using stratified analyses and interaction terms based on the Box–Tidwell transformation. The coefficients from all regression models are reported as odds ratios (OR) with 95% confidence intervals (CI).

Results

The demographic characteristics and socioeconomic characteristics of the study sample are presented in Table 1. Three-quarters of the sample was black African, and 61% of participants lived in an urban area. Slightly more than one-third of participants had completed high school, and one-fifth of individuals lived in households with more than R100,000 (approximately, US $16,000) per annum.

Strong associations were observed among measures of socioeconomic status, social support and social capital. Social support and social capital were positively associated (Pearson's correlation coefficient for the scale values, 0.114, $p < 0.001$). Levels of social support and social capital were unevenly distributed across socioeconomic strata in opposing directions. Increasing social support was associated with increasing socioeconomic position (42% of individuals with high levels of social support were of high SES, compared to 26% of individuals with low levels of social support, $p < 0.001$). Conversely, increasing social capital was associated with decreasing socioeconomic position: 27% of individuals with high levels of social capital were also of high SES, compared to 41% of individuals with low levels of social capital ($p < 0.001$).

Each measure of SES was strongly patterned according to participant location, with individuals living in rural settings having significantly lower levels of education, employment, family income, and access to household assets, compared to individuals in urban settings. For example, 7% of individuals living in rural settings had access to 13 or more household assets, compared to 33% of individuals living in urban settings ($p <$

0.0001). In addition, living in an urban setting was associated with lower levels of social capital (40% of individuals in urban settings reported low levels of social capital compared to 28% of participants living in rural settings, $p < 0.0001$) but there was no difference in levels of social support between individuals living in urban and rural settings (36% of individuals in rural settings reported low levels of social support compared to 33% of those in urban settings, $p = 0.094$).

Overall, 73% of the study sample scored between 10 and 19 on the K-10 scale, reflecting low levels of psychological distress, 11% showed moderate levels (scores 20–24), 8% showed high levels (scores 25–29), and 8% showed very high levels of distress (scores of 30 or higher). In unadjusted analyses, increased psychological distress was associated with age over 30 years, female gender, black African racial group (relative to white racial group), and rural location (Table 2). Increasing psychological distress was strongly associated with lower SES: compared to participants of high SES, individuals of moderate SES had 1.56 times the odds of psychological distress, and individual of low SES had 2.99 times the odds of psychological distress (p-value for trend <0.001). Similarly, low levels of both social support and social capital were moderately associated with increased psychological distress compared to the highest strata of each category (OR, 95% CI: 1.62, 1.11–2.37 and 1.56, 1.05–2.32, respectively).

There was a clear dose–response relationship between traumatic life events and psychological distress in the previous 30 days (Table 2) (Williams et al., 2007). Compared to individuals not experiencing any recent life events, individuals experiencing 1–2 life events in the previous 12 months had 2.3 times the odds of psychological distress; individuals experiencing 3–4 recent life events had 4 times the odds of psychological distress; and individuals reporting 5 or more recent life events had more than 7 times the odds of psychological distress. A similar gradient, with a somewhat weaker overall magnitude, was observed for traumatic life events. Experience of recent life events was strongly associated with SES, and this association was consistent across each measure of SES (Table 3). Compared to individuals in the highest tertile of SES, individuals in the lowest tertile were 1.55 times as likely to experience recent life events (95% CI: 1.26–1.90). Lower levels of social support were also associated with increased recent life events; however, there was no association between strata of social capital and recent life events.

In multivariate analysis, the association between each social construct and psychological distress persisted after adjusting for participant demographic characteristics (Table 4, panel A). However, when all the social constructs were entered into single model, the association between social support and psychological distress was attenuated after adjustment for joint confounding by SES and social capital (panel B). When both recent and traumatic life events were added to this model as putative pathways through which social determinants influenced psychological distress, the associations involving SES and social capital both persisted (panel C). Comparing the models with and without adjustment for recent life events (panels B and C), recent life events appeared to mediate the associations between SES and psychological distress (Aroian test p-value, 0.035). However, the occurrence of recent life events was not an intermediate factor in the association between social capital and psychological distress ($p = 0.400$).

The adjusted association between decreased social capital and increased psychological distress was strongest in the lowest stratum of SES (OR, 2.06) compared to the highest SES stratum (OR, 1.54) although this interaction did not reach statistical significance ($p = 0.112$). There was also no evidence for modification in the association between traumatic life events and psychological distress by strata of SES ($p = 0.700$). When the final model was restricted to black Africans, the overall association between SES and psychological distress remained

(OR comparing lowest to highest tertile of SES, 1.87; 95% CI: 1.02–3.41; $p = 0.048$), although the association between social capital and psychological distress was not statistically significant (OR comparing lowest to highest tertile of social capital, 1.59; 95% CI: 0.31–7.99; $p = 0.171$). The associations between each social determinant and psychological distress did not change appreciably when the final model was stratified by location of residence (rural or urban) or participant gender (not shown).

In a separate analysis of individual SES measures, increasing levels of education, household income and household asset ownership all showed a strong graded relationship with decreased levels of psychological distress (Table 5, panel A). These associations were only slightly attenuated when adjusted for participant demographic characteristics (panel B). However, when all measures of socioeconomic status were entered into the same model, few of the associations remained statistically significant (panel C).

Discussion

This analysis provides novel insights into the social determinants of population mental health in resource-limited settings. We found that decreased levels of SES and social capital were persistently associated with increased non-specific psychological distress experienced in the previous 30 days. The association between SES and psychological distress was mediated in part by recent life events. Levels of social support were less strongly associated with psychological distress, however, and there was no evidence for negative life events as a mediating factor.

The findings for a persistent gradient between decreased SES and increased psychological distress parallels the body of evidence for the general association observed in Europe, Australia and North America. Adding to the results of previous studies, this analysis demonstrated that the SES-psychological distress gradient operated independently of levels of social support and social capital, constructs that are often not included in analyses of SES and mental health. The data also suggest that lower levels of SES are associated with the increased occurrence of life events, which in turn is associated with increased psychological distress. However, there was still a substantial residual effect of SES on psychological distress after accounting for variation in traumatic and recent life events. Part of this residual effect may be attributed to incomplete measures of life events; although the measures employed here of recent and lifetime negative life events include a broad range of experiences, they are unlikely to capture all aspects of negative life events that may be shaped by SES, and in turn influence individual psychological distress (Turner, Wheaton, & Lloyd, 1995). It is also likely that many of the social conditions which contribute to psychological distress are not captured by measures of discrete life events, but instead are better considered as regular features of living in poverty and inequality; in this light, it may be unrealistic to expect that the influence of SES on psychological distress would be wholly mediated by any measure of life events. In addition, it is likely that there are other pathways through which reduced SES influences mental health. Such alternate pathways are likely to include environmental stressors as well as access to protective resources such as education and health services. There was no suggestion in these data that the strength of association between negative life events and psychological distress differed by levels of SES, suggesting that levels of SES are unlikely to alter vulnerability to negative life events. Additional research is required to examine the different mechanisms through which wealth and poverty influence population mental health, both to identify the most vulnerable subpopulations and to target health promotion interventions aimed at reducing the burden of mental illness.

We also found a persistent association between decreased levels of social capital and psychological distress, independent of participants' levels of social support and SES. This

association is in keeping with the results of several previous studies (Almedom, 2005; Caughy et al., 2003; De Silva, Huttly, Harpham, & Kenward, 2007) but is among the first such findings from a population-based study in a developing country. There was no association between this measure of social capital and the experience of life events, and in turn no evidence for the mediation of this association by negative life events. Taken together, these results suggest that reduced levels of social capital may be associated with increased psychological distress through other mechanisms, including increased individual psychological resources (such as self-esteem or self-efficacy), a possibility that requires additional research. The persistent associations of lower levels of both SES and social capital with increased psychological distress was observed despite the inverse association between these two measures, with higher levels of social capital observed among individuals of lower SES, on average. While such a finding may appear counterintuitive, it points to the possibility of social capital as a resource which can act to offset the negative mental health impacts of reduced socioeconomic status (Thomas, 2006).

These results should be interpreted in light of several important limitations. First, the cross-sectional nature of the study design makes the temporal order of the observed associations difficult to distinguish. Specifically, it is not possible to discern whether individual psychological distress affects social and economic conditions, whether social and economic conditions influence psychological distress, or whether the relationship is bi-directional. The K-10 measure of non-specific psychological distress refers only to symptoms in the 30 days before the interview, and the measure of recent negative life events refers to the previous 12 months; in contrast to this, measures of SES, social capital and social networks did not have a reference period, and are likely to be highly stable over a period of months to years. Thus it seems plausible that individual SES precedes recent negative life events, which in turn precede psychological distress. However, prospective studies are necessary to discern the temporality of these associations more definitively. It is important to note that we focused on participants' current SES, and did not examine childhood socioeconomic position, which may be a separate determinant of mental health outcomes (Gilman, Kawachi, Fitzmaurice, & Buka, 2002; Power et al., 2002).

Second, the social constructs studied here are complex phenomena that can be difficult to measure. The measures of SES used here, incorporating both traditional SES constructs (employment, education, income) as well as more locally-appropriate measures of wealth (based on material wealth, household resources and access to financial institutions), is likely to capture meaningful variability across the different economic systems which operate in a middle-income country such as South Africa (Myer et al., 2004). We found that each measure of SES showed similar associations with psychological distress, even after adjusting for participant demographic characteristics; with growing evidence that different measures of SES may capture different pathways of disease causation in different populations (Braveman et al., 2005), the associations between individual measures of SES and specific mental disorders requires more attention. The measure of social support is also robust, but does not capture the negative aspects of social relations (such as conflict and interpersonal demands). There is evidence to suggest that the negative aspects of social relations may be more important than positive support in the aetiology of mental health (Lincoln, Chatters, & Taylor, 2003), a possibility that warrants more attention.

Social capital is particularly complex and context-specific, with no well-established method of measuring of this construct across populations (Harpham, Grant, & Thomas, 2002). The measures used here focus on cognitive and structural aspects of bonding social capital assessed at the individual level. Several components of bonding social capital were not included here, and these measures focused entirely on social capital measured at the individual level. Future research is required to explore how other aspects of bonding social

capital, as well as bridging social capital and ecological measures, relate to mental health outcomes. Nonetheless, we found a persistent association between these measures of bonding social capital and psychological distress after adjusting for individual demographic characteristics, social support and socioeconomic status, suggesting that the items used here do capture meaningful variability in health-related social perceptions and behaviors. While these findings provide preliminary evidence for this association, the measurement of social capital in low- and middle-income settings requires more attention particularly in the context of mental health research. In this analysis, we may anticipate that any measurement error in our assessment of social capital occurred independently of the true level of social capital, leading to the observed association between social capital and mental health being attenuated; with more precise measures adapted for use in South Africa, we may expect to see a stronger link between low levels of social capital and increased psychological distress.

South Africa has a unique historical context, high levels of violence and trauma, and greater socio-cultural and economic diversity than many other middle-income countries. While this diversity provides variability in social conditions, it also presents significant challenges to the study of the social determinants of mental health. Mental health measures may have different meanings in different groups within the South African population, the most relevant types of life events may vary across settings, and the most relevant aspects of social networks and social capital may differ between communities. This potential diversity points to the need to better understand the validity of these measures and other constructs in public mental health research within South Africa.

This research focused on non-specific psychological distress as a general mental health outcome. The same measure, with appropriate translation, was applied across multiple socio-cultural and linguistic groups and the possibility that the validity of the K-10 varies in different contexts requires future research attention. And while this may be a robust measure of population mental health, it collapses together different forms of pathology which may have differing social aetiologies. Additional research is required to understand how social determinants influence specific disorders, with particular attention to common mood and anxiety disorders that are associated with the greatest population-level burden of disease. In addition, while these data come from a representative sample of the South African population, these findings should be generalized with caution. With a growing body of research on population mental health in developing countries, including the work of the World Mental Health Survey Initiative, the social determinants of mental health outcomes can be assessed in additional low- and middle-income countries (Kessler, Haro, Heeringa, Pennell, & Ustun, 2006).

These cross-sectional data demonstrate that lower levels of SES and social capital are independently associated with increased levels of psychological distress in South Africa, paralleling results from developed countries. While life events appeared to partially mediate the association between decreased SES and increased distress, further prospective research is needed to understand the temporality of this association as well as the mechanisms through which poverty contributes to mental illness in low- and middle-income countries.

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Table 1

Description of participant demographic characteristics, socioeconomic status, social support and social capital in a nationally-representative sample of South African adults

	% or Mean
Demographic characteristics	
Age (mean) (years)	37.0
18–29	39.1
30–39	22.1
40–49	18.1
50+	20.7
Gender	
Female	53.7
Male	46.3
Race	
Black	76.2
Coloured	10.4
White	10.0
Indian/Asian	3.4
Currently married	50.1
Location	
Urban	61.6
Rural	38.4
Socioeconomic status	
Education	
None	6.8
Grade 1–7	19.1
Grade 8–11	35.4
Completed high school	23.4
Post-high school education	15.3
Employed	31.1
Household income (mean)	R59,404
R0	13.7
R1–5000	29.5
R5001–25,000	15.4
R25,000–100,000	19.6
R100,001+	21.8
Assets owned by household: 0–5	39.3
6–12	37.4
13–17	23.3
Social support	
Contact with family member: nearly every day*	22.7
Contact with friends: nearly every day*	40.3

	% or Mean
Can rely on family/friends if in a serious problem: a lot**	57.7
Can open up to family/friends to talk about worries: a lot**	49.3
Someone in life to share private feelings & concerns: Yes***	81.7
Social capital	
How often do you get together with neighbours: a lot****	36.5
How often are there problems with crime in area: very often*****	23.1
Are there community groups in this area: Yes***	59.8
Are you involved in any community groups: Yes***	31.9

* These items are coded as: nearly every day (4+ times/week), 3–4 days/week, 1–2 days/week, 1–3 days/month, less than once a month, never.

** These items are coded as: a lot, some, little, not at all.

*** These items are coded as: Yes or No.

**** This item is coded as: nearly every day (4+ times/week); 1–3 times/week; 2–3 times a month; at least once a month; a few times a year; never.

***** This item is coded as: very often; fairly often; not too often; hardly ever; never; this item was reverse-coded, so that higher perceived levels of crime were associated with lower social capital.

Table 2

Unadjusted associations between 30-day psychological distress and socioeconomic status, social support and social capital, in a nationally-representative sample of South African adults

	Category of psychological distress (total K-10 score)					Comparison of 30+ versus <30	
	Low (0–19)	Moderate (20–24)	High (25–29)	Very high (30+)	*p*-Value	Odds ratio	95% CI
Overall prevalence	73.3	10.7	7.9	8.2			
Demographic characteristics							
Age							
18–29	40.1	41.2	35.8	30.5	0.324	1.0	(Reference)
30–39	21.4	23.0	25.0	24.1		1.44	1.06–1.97
40–49	17.7	18.1	18.8	22.0		1.62	1.10–2.38
50+	20.8	17.7	21.5	23.4		1.49	1.04–2.14
Gender							
Female	52.0	57.1	53.3	64.6	0.003	1.64	1.19–2.26
Race							
Black African	73.6	81.8	82.8	85.8	0.015	1.0	(Reference)
Coloured	11.0	7.8	10.0	9.8		0.82	0.49–1.36
White	11.7	7.8	5.1	2.2		0.18	0.08–0.39
Indian/Asian	3.7	2.6	2.2	2.3		0.59	0.26–1.31
Currently married	49.7	49.4	51.1	54.1	0.583	1.18	0.94–1.51
Urban location	62.4	64.2	58.5	54.1	0.126	0.71	0.52–0.98
Socioeconomic status							
High	39.7	30.8	27.2	21.4	<0.001	1.0	(Reference)
Moderate	33.2	35.1	35.4	29.8		1.56	1.06–2.29
Low	27.1	34.1	37.4	48.9		2.99	2.01–4.44
Social support							
High	35.3	33.8	28.1	26.1	0.014	1.0	(Reference)
Moderate	34.2	30.2	31.5	34.7		1.37	0.93–2.01
Low	30.4	36.0	40.4	39.2		1.62	1.11–2.37
Social capital							
High	33.5	29.6	27.4	24.4	0.035	1.0	(Reference)
Moderate	31.9	35.7	36.4	34.9		1.42	1.02–1.79

	Category of psychological distress (total K-10 score)					Comparison of 30+ versus <30	
	Low (0–19)	Moderate (20–24)	High (25–29)	Very high (30+)	*p*-Value	Odds ratio	95% CI
Low	34.7	34.7	36.1	40.7		1.56	1.05–2.32
Recent life events							
None	40.1	26.5	19.7	15.0	<0.001	1.0	(Reference)
1–2	40.7	35.6	37.5	36.7		2.26	1.64–3.11
3–4	14.5	23.7	24.8	26.9		4.02	2.60–6.21
5 or more	4.7	14.1	18.0	21.4		7.58	4.93–11.63
Traumatic life events							
None	29.3	20.8	17.5	19.1	<0.001	1.0	(Reference)
1–2	50.7	46.8	51.3	45.9		1.31	0.92–1.86
3–4	9.5	14.5	15.1	13.3		1.80	1.08–3.02
5 or more	10.5	17.9	16.1	21.7		2.62	1.71–4.01

Table 3

Unadjusted associations between recent (12 month) life events and socioeconomic status, social support and social capital, in a nationally-representative sample of South African adults

	Recent life events					Comparison of 3+ versus none	
	None	1–2	3–4	5+	*p*-Value	OR	95% CI
Overall prevalence	35.0	39.5	17.3	8.1			
Socioeconomic status							
Education							
None	6.4	7.8	6.5	4.4	0.001	1.0	(Reference)
Grade 1–7	18.4	18.5	20.0	23.3		0.97	0.68–1.39
Grade 8–11	35.6	36.3	36.9	39.1		1.04	0.71–1.52
Completed high school	22.6	23.2	26.1	22.5		0.97	0.68–1.38
Post-high school education	20.0	14.3	10.6	10.8		0.59	0.38–0.90
Employed	38.3	29.6	24.0	21.3	<0.001	0.59	0.47–0.74
Household income							
R0	12.0	13.3	16.4	16.9	<0.001	1.0	(Reference)
R1–5000	24.7	30.8	35.5	31.8		0.94	0.76–1.16
R5001–25,000	15.5	15.8	12.8	18.2		0.71	0.54–0.94
R25,000–10,0000	22.5	19.0	17.6	14.6		0.62	0.46–0.81
R100,001+	25.4	21.2	17.7	18.5		0.59	0.43–0.81
Assets owned by household							
0–5	35.9	40.0	44.6	43.9	<0.001	1.0	(Reference)
6–12	32.9	39.1	39.9	43.5		1.03	0.85–1.25
13–17	31.8	21.3	15.5	12.6		0.50	0.39–0.64
Socioeconomic status							
High	43.1	34.6	30.8	27.0	<0.001	1.0	(Reference)
Moderate	29.8	34.8	34.7	38.6		1.45	1.12–1.87
Low	27.1	30.7	34.6	34.4		1.55	1.26–1.90
Social support							
High	35.4	34.4	32.7	26.9	0.027	1.0	(Reference)
Moderate	35.8	32.4	33.2	31.2		1.08	0.86–1.37
Low	28.9	33.25	34.1	41.9		1.33	1.03–1.72

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	Recent life events					Comparison of 3+ versus none	
	None	1–2	3–4	5+	*p*-Value	OR	95% CI
Social capital							
High	31.7	33.4	31.6	34.8	0.087	1.0	(Reference)
Moderate	31.4	32.2	3435	39.8		1.26	1.02–1.57
Low	36.9	34.4	33.9	35.4		1.07	0.87–1.32

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Table 4

Results of logistic regression models predicting relative odds of 30-day psychological distress according to participant demographic characteristics, social determinants, and life events, in a nationally-representative sample of South African adults

	(A) Model adjusted for demographic characteristics only*		(B) Model adjusted for demographic characteristics and social constructs		(C) Model adjusted for demographic characteristics, social constructs and life events	
	OR	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**
Socioeconomic status						
High	1.0	(Reference)	1.0	(Reference)	1.0	(Reference)
Moderate	1.23	0.81–1.86	1.22	0.81–1.84	1.17	0.76–1.78
Low	2.22	1.43–3.45	2.20	1.42–3.40	2.11	1.36–3.29
Social support						
High	1.0	(Reference)	1.0	(Reference)	1.0	(Reference)
Moderate	1.34	0.91–1.97	1.30	0.87–1.92	1.32	0.90–1.95
Low	1.51	1.03–2.19	1.36	0.92–2.00	1.27	0.88–1.85
Social capital						
High	1.0	(Reference)	1.0	(Reference)	1.0	(Reference)
Moderate	1.49	1.07–2.08	1.50	1.08–2.08	1.38	1.01–1.87
Low	1.76	1.17–2.64	1.73	1.16–2.59	1.67	1.12–2.49
Recent life events						
None					1.0	(Reference)
1–2					1.98	1.41–2.77
3–4					3.27	2.04–5.25
5 or more					6.21	3.95–9.78
Traumatic life events						
None					1.0	(Reference)
1–2					1.09	0.75–1.58
3–4					1.26	0.73–2.16
5 or more					1.82	1.16–2.88

*Demographic characteristics included in these models are: age category, gender, race, and location (urban/rural).

Results presented as odds ratios (OR) with 95% confidence intervals (CI).

Table 5

Results of logistic regression models of the associations between 30-day psychological distress and individual measures of socioeconcomic status in a nationally-representative sample of South African adults

	(A) Model of unadjusted associations involving individual measures		(B) Model of associations adjusted for participant demographic characteristics only*		(C) Model of associations adjusted for participant demographic characteristics and other measures of SES in table*	
	OR	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**
Education						
None	1.0	(Reference)	1.0	(Reference)	1.0	(Reference)
Grade 1–7	1.10	0.65–1.86	1.09	0.65–1.82	1.12	0.66–1.89
Grade 8–11	0.83	0.55–1.26	0.96	0.62–1.46	1.01	0.64–1.61
Completed high school	0.39	0.22–0.67	0.50	0.28–0.88	0.56	0.30–1.03
Post-high school education	0.32	0.14–0.71	0.46	0.19–1.11	0.66	0.28–1.54
Employed	0.58	0.43–0.78	0.62	0.45–0.86	0.70	0.50–0.99
Household income						
R0 (None)	1.0	(Reference)	1.0	(Reference)	1.0	(Reference)
R1–5000	0.83	0.61–1.15	0.80	0.58–1.10	0.91	0.64–1.31
R5001–25,000	0.60	0.38–0.92	0.65	0.41–1.01	0.83	0.50–1.37
R25,000–100,000	0.52	0.34–0.79	0.60	0.40–0.89	0.75	0.49–1.14
R100,001+	0.41	0.27–0.63	0.49	0.31–0.77	0.60	0.35–1.01
Assets owned by household						
0–5	1.0	(Reference)	1.0	(Reference)	1.0	(Reference)
6–12	0.72	0.53–0.98	0.74	0.55–1.01	0.88	0.63–1.21
13–17	0.34	0.20–0.57	0.48	0.25–0.91	0.79	0.42–1.49

*Demographic characteristics included in these models are: age category, gender, race, and location (urban/rural).

Results presented as odds ratios (OR) with 95% confidence intervals (CI).