Perceived discrimination and mental health disorders: The South African Stress and Health study

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Objectives. To describe the demographic correlates of perceived discrimination and explore the association between perceived discrimination and psychiatric disorders.

Design. A national household survey was conducted between 2002 and 2004 using the World Health Organization Composite International Diagnostic Interview (CIDI) to generate diagnoses of psychiatric disorders. Additional instruments provided data on perceived discrimination and related variables.

Setting. A nationally representative sample of adults in South Africa.

Subjects. 4 351 individuals aged 18 years and older.

Outcomes. 12-month and lifetime mood, anxiety and substance use disorders.

Results. In the multivariate analyses, acute and chronic racial discrimination were associated with an elevated risk of any 12-month DSM-IV disorder when adjusted for socio-demographic factors, but this association was no longer statistically significant when adjusted for other sources of social stress. In fully adjusted models, acute racial discrimination was associated with an elevated risk of lifetime substance use disorders. Acute and chronic non-racial discrimination were associated with an elevated risk of 12-month and lifetime rates of any disorder, even after adjustment for other stressors and potentially confounding psychological factors. The association of chronic non-racial discrimination and 12-month and lifetime disorder was evident across mood, anxiety, and substance use disorders in the fully adjusted models.

Conclusion. The risk of psychiatric disorders is elevated among persons who report experiences of discrimination. These associations are more robust for chronic than for acute discrimination and for non-racial than for racial discrimination. Perceived discrimination constitutes an important stressor that should be taken into account in the aetiology of psychiatric disorders.

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Discrimination includes actions (subtle or overt, direct or indirect) that limit the social, political or economic opportunities of particular groups[1] and may have short- and long-term consequences.[2] Considering that perceived discrimination by victimised groups captures a sense of oppression by members of the dominant group, it can have profound psychological effects on its victims.[3] There is evidence of a strong association between perceived discrimination and objective indicators of inequality, and with psychiatric disorder.[4] Empirical research has examined the association between perceived discrimination and health.[5,6] Most early research utilised samples of black persons in North America. Research documents an inverse association between self-reported discrimination and health for multiple racial groups in the USA, immigrant populations in European countries, and non-dominant racial groups in Australia and New Zealand.[6] Mental health outcomes have been the most widely used measure of health status in these studies, but there has been little research on the psychological impact of discrimination in South Africa and its mental health consequences.

Researchers have suggested that the subjective experience of South African racial discrimination, which was supported by law and custom, could have had extremely negative psychological consequences.[7,8] National data from South Africa found that perceived racial discrimination was unrelated to self-rated ill health, but positively associated with psychological distress.[9] Research on perceived discrimination and health also suggests that the generic perception of unfair

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treatment tends to be adversely related to health, regardless of whether the discriminatory behaviour is attributed to race or other factors.[6] Because of attributional ambiguity in many interpersonal encounters and a growing reluctance to explicitly discuss racism in South Africa, it is important to examine the health correlates of racial and non-racial discrimination.[9] We examined the relationship between perceived discrimination and psychiatric disorders using a national probability sample of adult South Africans, looking at the extent to which perceived discrimination is associated with the report of mood, anxiety or substance use disorders within a 12-month period and over a lifetime, taking into account socio-demographic characteristics. Previous research is inconsistent with regard to whether discrimination is related to ill health independent of other measures of stress.[6,9] In addition, psychological predispositions can affect the perception of discriminatory behaviour and the likelihood of reporting it. Accordingly, we examined the extent to which the association between self-reports of discrimination and mental disorders are independent of other sources of stress and psychological factors.

Methods

Setting

Data come from the South African Stress and Health (SASH) study, a large psychiatric epidemiological survey conducted between January 2002 and July 2004 in South Africa.[10] Its primary goal was to measure the prevalence of mental health problems in a nationally representative sample of adults aged 18 years and older. The sample is representative of the population of non-institutionalised adults in South Africa (i.e. not in prisons, hospitals or mental institutions, or on military bases).

In-person interviewing took place across all provinces in South Africa. The overall response rate was 86%. Interviews lasted an average of 3 - 4 hours and were conducted in English, Afrikaans, Zulu, Xhosa, Northern Sotho, Southern Sotho and Tswana, based on translations and back-translations developed by panels of bilingual and multilingual experts following World Health Organization recommendations. A total of 4 351 adults were included. A post-stratification weight made the sample distribution comparable to the population distribution in the 2001 South African census for age, sex, and province.

Measures

All items were coded such that a high score reflects a high level of that variable. Acute discrimination is an index that counts the occurrence of nine specific experiences of unfair treatment in domains of employment, education, housing and interactions with the police that respondents had experienced over their lifetime.[11,12] Experiences attributed by participants to race (racial discrimination) were distinguished from those attributed to other social status categories, such as gender or age (non-racial discrimination). More specifically, respondents were asked 'What do you think was the main reason for this experience: your gender, race, age, tribe, height, weight, some other aspect of your physical appearance, or some other reason?' In analyses, those reporting zero experiences of acute discrimination were compared with those reporting one and more than one such experience.

Chronic discrimination was assessed by an expanded version of the everyday discrimination scale.[12] The original scale contained 9 items that assessed the frequency (on a 5-point scale from 'almost every day' to 'never') of exposure to chronic discrimination, such as being treated with less courtesy and respect or receiving poorer service than others in restaurants and stores. A 10th item, being followed around in stores, was added and the 10 items were summed to create a racial and non-racial everyday discrimination scale. The reliability of these scales was high, as the Cronbach's alpha for the everyday racial discrimination scale was 0.84 overall (0.84 for blacks, 0.81 for coloureds, 0.81 for Indians/Asians and 0.78 for whites) and for the everyday non-racial discrimination scale 0.91 overall (0.91 for blacks, 0.91 for coloureds, 0.88 for Indians/Asians and 0.88 for whites).

Social stress was measured by undesirable life events, relationship stress and domestic violence, three types of stressors assessed with the WHO's World Mental Health Initiative Survey.[13] The life events measure was a count of 12 experiences respondents were exposed to during the 12 months before the interview. Life events include a serious illness or injury, being victim of a serious physical attack or assault, robbery, death of a loved one, estranged close relationships and employment-related losses. Domestic violence perpetration was assessed by the frequency with which the respondent had slapped or hit, thrown something at, or pushed, grabbed or shoved her/his current or former spouse or partner. Domestic violence victimisation was assessed by the frequency with which the respondent had been a recipient of these actions from her/his current or former spouse or partner. Relationship stress was a count of the number of respondents' reports of serious, ongoing disagreements or problems getting along with any family members, any close friends or anyone at work in the past year.

Since psychological dispositions may affect perceptions of discrimination, we included controls for self-esteem, mastery and social desirability bias. Self-esteem referred to global feelings of self-worth and was assessed by the level of agreement to 4 items drawn from the Rosenberg self-esteem scale:[14] (*i*) 'I have a positive attitude towards myself'; (*ii*) 'I feel satisfied with myself'; (*iii*) 'I feel useless at times'; and (*iv*) 'I think that I am no good at all'. The alpha coefficient for this scale was 0.56 overall (0.54 for blacks, 0.58 for coloureds, 0.50 for Indians/Asians and 0.66 for whites). Mastery assessed the extent to which an individual perceived events and outcomes to be within his/her personal control. Respondents reported

the extent of their agreement with 4 items from the Pearlin mastery scale: (*i*) 'there is no way I can solve some of the problems I have'; (*ii*) 'I have little control over what happens to me'; (*iii*) 'I often feel helpless in dealing with the problems of life'; and (*iv*) 'there is little I can do to change many of the important things in my life'.[15] The reliability coefficient for this scale was 0.82 and comparable across racial groups. Social desirability bias refers to the tendency to select socially acceptable responses, even if they are not true.[16] Respondents were asked if a series of 10 questions were true (coded 1) or not true (coded 0), such as 'I have always told the truth; I have never been bored; I always win at games; I have never lost anything'. The alpha coefficient for this scale was 0.72 and was comparable across racial groups.

The racial categories black, coloured, Indian/Asian and white are used because of the need to measure and monitor the progress in eradicating the consequences of racism in post-apartheid South Africa. The 1996 and 2001 South African population census employed the 'self-identifying' question about 'race' or 'population group' and the Employment Equity Act of 1998 makes provisions for 'designated groups' being 'black people, women and people with disabilities'. The Act defines 'black' as referring to 'Africans, coloureds and Indians'.

Three traditional measures of socio-economic status were included: education was measured in categories (none, some primary, some secondary, some university or more); income was measured in categories (none, R1 - 1 500, R1 501 - 16 500, R16 501 - 97 500, R97 501 and higher); and employment status compared the employed with the unemployed. Demographic controls included sex, age, marital status, and urban residence (versus rural).

The WHO Composite International Diagnostic Interview Version (CIDI 3.0) was used to measure psychiatric disorders based on the *Diagnostic and Statistical Manual*, 4th edition (DSM-IV).[17] The CIDI has demonstrated good inter-rater reliability, test-retest reliability and validity.[18] This analysis includes 12-month and lifetime mood disorders (i.e. major depressive disorder, dysthymia), anxiety disorders (i.e. agoraphobia, generalised anxiety disorder, panic disorder, post-traumatic stress disorder, social phobia), substance use disorders (i.e. alcohol abuse, alcohol dependence, drug abuse, drug dependence), and any of these three types of disorder. DSM-IV organic exclusion rules and diagnostic hierarchy rules were applied to all diagnoses, except in the case of substance use disorders where abuse was defined with or without dependence.

Analysis

Data were analysed using Stata Version 9.2 (Stata Corporation, College Station, USA).

Percentages are initially reported to describe basic associations between participant demographic characteristics and levels of perceived racial and non-racial discrimination (acute and chronic). A series of multiple logistic regression models examined the association between perceived discrimination and psychiatric disorders. Model 1 examined the relationship between discrimination and psychiatric disorder, adjusting for socio-demographic factors. Model 2 added controls for other social stressors and model 3 added adjustments for psychological factors. Logistic regression coefficients and their design-corrected standard errors (SEs) were exponentiated and are reported as odds ratios (ORs) with 95% confidence intervals (CIs).

Results

Socio-demographic data and discrimination

Table I presents the level of perceived discrimination according to demographic risk factors. A higher percentage of men than women reported acute racial, acute non-racial and chronic racial discrimination. Reports of discrimination appeared to decline with age. Blacks reported higher levels of acute and chronic racial discrimination than whites. Indians reported the highest levels of acute and chronic racial discrimination, while blacks reported the highest levels of chronic non-racial discrimination. The most educated participants reported the highest levels of acute racial discrimination. There was no consistent pattern between income and the different forms of discrimination, whereas the employed clearly reported higher levels of discrimination (acute racial and chronic racial) than the unemployed. The unemployed reported higher levels of chronic non-racial discrimination than the currently employed. South Africans who had never married reported higher levels of chronic non-racial discrimination than the currently and formerly married. Adults in urban areas reported more acute discrimination (racial and non-racial) than those who resided in rural areas.

Perceived discrimination and psychiatric disorder

Table II shows the association between perceived discrimination and 12-month psychiatric disorder. There was an increase in the odds of being diagnosed with a DSM-IV disorder among those who had experienced acute and chronic discrimination (racial and non-racial) even after adjusting for demographic characteristics (model 1). However, only those adults who reported two or more incidents of acute non-racial discrimination (OR_{nr}=1.79) or any level of chronic non-racial discrimination (OR_{low}=1.81; OR_{high}=1.86) had higher odds of reporting DSM-IV disorder, after controlling for other stressors (model 2) and psychological factors (model 3).

In terms of the types of disorders that are associated with reports of discrimination, adults who experienced chronic non-racial discrimination had twice the odds of reporting a mood disorder than those who had never experienced non-racial

Table I. Demographic correlates of reports of any perceived discrimination, South Africa

Risk factor	Acute non-racial	Acute racial	Chronic non-racial	Chronic racial
Gender				
Male	10.34	16.64	12.37	27.04
Female	4.47	12.23	9.56	29.52
χ^2/DF (prob)	28.74/1 (0.00)	8.86/1 (0.00)	4.11/1 (0.05)	1.39/1 (0.24)
Age (yrs)				
18 - 34	6.49	15.31	11.53	32.28
35 - 49	9.37	14.77	11.56	26.02
50 - 64	6.57	12.23	10.32	22.41
≥65	4.12	7.58	2.19	20.54
χ^2/DF (prob)	10.00/3 (0.03)	9.51/3 (0.03)	38.49/3 (0.00)	24.50/3 (0.00)
Race				
Black	7.56	14.18	11.77	30.53
Coloured	7.40	11.06	11.16	19.22
White	3.09	16.61	3.29	22.79
Indian	10.74	20.11	12.20	27.08
χ^2/DF (prob)	13.13/3 (0.01)	6.63/3 (0.10)	11.04/3 (0.02)	12.64/3 (0.01)
Income (R)				
0	6.19	11.42	12.84	22.82
1 - 1 500	6.53	14.14	8.99	30.69
1 501 - 16 500	8.36	13.06	10.58	28.22
16 501 - 97 500	7.89	15.67	12.06	28.57
≥97 501	6.67	16.01	10.56	29.49
χ^2/DF (prob)	2.71/4 (0.61)	6.08/4 (0.21)	3.20/4 (0.53)	6.22/4 (0.20)
Marital status				
Married	7.29	15.08	10.72	25.12
Sep/div/wid	6.99	14.77	8.58	24.26
Never married	7.12	13.32	11.36	32.62
χ^2/DF (prob)	0.04/2 (0.98)	1.30/2 (0.52)	1.92/2 (0.39)	17.57/2 (0.00)
Education				
None	7.89	11.38	12.08	25.82
Primary	5.24	13.01	10.12	30.77
Secondary	6.56	14.18	10.99	27.58
High school	7.84	14.56	12.52	30.08
University	9.63	16.74	8.50	25.79
χ^2/DF (prob)	9.96/4 (0.05)	4.15/4 (0.40)	5.29/4 (0.27)	4.99/4 (0.30)
Employment				
Unemployed	5.59	13.57	9.81	30.22
Employed	10.89	15.81	13.14	24.37
χ^2/DF (prob)	13.42/1 (0.00)	1.94/1 (0.17)	4.25/1 (0.04)	3.92/1 (0.05)
Location				
Rural	4.92	11.72	11.48	31.10
Urban	8.63	15.90	10.47	26.65
χ^2/DF (prob)	7.57/1 (0.01)	5.36/1 (0.02)	0.28/1 (0.60)	3.34/1 (0.07)

Values are percentages with standard errors in parentheses.

discrimination. The odds of reporting an anxiety disorder were twice as high among adults who reported acute and chronic non-racial discrimination (especially at high levels). The odds of reporting a substance use disorder remained high among those who reported high levels of chronic non-racial discrimination.

The association between perceived discrimination and lifetime psychiatric disorders is presented in Table III. Adults who experienced two or more incidents of acute discrimination, racial and non-racial (OR_{ar}=1.87; OR_{anr}=1.72), or any level of chronic non-racial discrimination (OR_{low}=1.44; OR_{high}=1.75), were much more likely to report a lifetime DSM-IV disorder than adults who had not been exposed to these personal assaults. This pattern is evident even after adjusting for stress and psychological factors (models 2 and 3).

Discussion

The data on South African adults are consistent with literature reporting that perceived discrimination is differentially distributed in the population groups and is inversely associated with mental health.[6] Acute and chronic racial discrimination are associated with an elevated risk of any 12-month DSM-

Table II. Association of perceived discrimination with any 12-month, mood, any anxiety, and any substance disorder

Perceived discrimination	Any 12-month DSM-IV disorder	12-month DSM-IV mood disorder	12-month DSM-IV anxiety disorder	12-month DSM-IV substance use disorder
Adjusted for demographics				
1. Acute racial (none = omitted)				
a. One event	1.50 (0.9 - 2.4)	1.00 (0.4 - 2.7)	1.36 (0.5 - 3.5)	2.01 (1.2 - 3.5)**
b. Two or more	1.76 (1.1 - 2.9)*	1.26 (0.5 - 3.2)	1.07 (0.6 - 2.0)	2.03 (1.0 - 4.1)*
2. Acute non-racial (none = omitted)				
a. One event	1.40 (0.9 - 2.1)	1.29 (0.7 - 2.4)	0.93 (0.5 - 1.7)	1.42 (0.7 - 2.8)
b. Two or more	2.15 (1.4 - 3.3)***	1.42 (0.8 - 2.6)	2.51 (1.5 - 4.3)***	2.12 (1.1 - 4.1)*
3. Chronic racial discrim. (none = omitted)				
a. Any	1.38 (1.0 - 1.9)*	1.68 (0.9 - 3.1)	1.13 (0.7 - 1.8)	1.12 (0.7 - 1.8)
4. Chronic non-racial discrim. (none = omitted)				
a. Low	1.99 (1.6 - 2.5)***	2.14 (1.4 - 3.2)***	1.13 (0.7 - 1.8)	1.19 (0.6 - 2.2)
b. High	2.66 (1.9 - 3.7)***	2.75 (1.7 - 4.6)***	3.25 (2.2 - 4.7)***	2.50 (1.6 - 4.0)***
Adjusted for other stressors				
1. Acute racial (none = omitted)				
a. One event	1.23 (0.8 - 2.0)	0.89 (0.3 - 2.5)	1.12 (0.4 - 2.9)	1.65 (0.9 - 3.1)
b. Two or more	1.40 (0.9 - 2.3)	1.09 (0.4 - 2.8)	0.86 (0.5 - 1.6)	1.60 (0.8 - 3.3)
2. Acute non-racial (none = omitted)				
a. One event	1.11 (0.7 - 1.8)	1.08 (0.6 - 2.0)	0.73 (0.4 - 1.4)	1.14 (0.6 - 2.4)
b. Two or more	1.84 (1.2 - 2.9)**	1.27 (0.7 - 2.4)	2.11 (1.2 - 3.6)**	1.78 (0.9 - 3.6)
3. Chronic racial discrim. (none = omitted)				
a. Any	1.22 (0.9 - 1.7)	1.61 (0.9 - 2.9)	0.98 (0.6 - 1.6)	0.95 (0.6 - 1.6)
4. Chronic non-racial discrim. (none = omitted)				
a. Low	1.88 (1.5 - 2.4)***	2.07 (1.4 - 3.1)***	0.98 (0.6 - 1.6)	1.11 (0.6 - 2.1)
b. High	2.03 (1.5 - 2.8)***	2.31 (1.4 - 3.8)**	2.39 (1.7 - 3.4)***	1.84 (1.2 - 2.9)**
Adjusted for psychological factors				
1. Acute racial (none = omitted)				
a. One event	1.35 (0.8 - 2.2)	1.00 (0.4 - 2.8)	1.25 (0.5 - 3.3)	1.74 (0.9 - 3.2)
b. Two or more	1.45 (0.9 - 2.3)	1.11 (0.4 - 2.8)	0.92 (0.5 - 1.7)	1.64 (0.8 - 3.5)
2. Acute non-racial (none = omitted)				
a. One event	1.10 (0.7 - 1.8)	1.07 (0.6 - 2.1)	0.73 (0.4 - 1.4)	1.10 (0.5 - 2.3)
b. Two or more	1.79 (1.1 - 2.8)**	1.17 (0.6 - 2.2)	2.07 (1.2 - 3.6)**	1.76 (0.9 - 3.5)
3. Chronic racial discrim. (none = omitted)				
a. Any	1.17 (0.9 - 1.6)	1.66 (0.9 - 3.2)	0.96 (0.6 - 1.5)	0.88 (0.5 - 1.5)
4. Chronic non-racial discrim. (none = omitted)				
a. Low	1.81 (1.4 - 2.3)***	1.99 (1.3 - 3.0)**	0.96 (0.6 - 1.5)	1.09 (0.6 - 2.1)
b. High	1.86 (1.3 - 2.6)***	2.16 (1.3 - 3.7)**	2.16 (1.5 - 3.1)***	1.75 (1.1 - 2.8)*

*$p \leq 0.05$.
**$p \leq 0.01$.
***$p \leq 0.001$.
Socio-demographics = age, sex, marital status, urban/rural location, race, education, income, natural resources, wealth and employment status. Other stressors: life events, relationship events, domestic violence, victimisation and perpetration; psychological factors = self-esteem, mastery and social desirability.
Values are percentages with standard errors in parentheses.

IV disorder when adjusted for socio-demographic factors. Exposure to other stressful experiences renders the association insignificant. Acute racial discrimination is associated with an elevated risk of lifetime substance use disorders, but chronic racial discrimination has no significant association with the disorders studied.

Acute and chronic non-racial discrimination are associated with an elevated risk of 12-month and lifetime rates of any disorder even after adjustment for other stressors and potentially confounding psychological factors. These associations were evident across mood, anxiety and substance use disorders. It is not clear why non-racial discrimination is more strongly related to mental health risk than racial discrimination. Research on stress has found that stressors that are unexpected and unpredictable often have more adverse health consequences than those that are more normative. It is possible that given South Africa's history of deeply entrenched racial discrimination, the black groups that have historically experienced racial discrimination have become more accustomed to dealing with it and are better able to cope with this stressor than with non-racial discrimination. Research in the USA has noted that exposure to discrimination sometimes affects the health of whites more adversely than of blacks, and

Table III. Association of perceived discrimination with any lifetime, mood, any anxiety, and any substance disorder (% (SE))

Perceived discrimination	Any lifetime DSM-IV disorder	Lifetime DSM-IV mood disorder	Lifetime DSM-IV anxiety disorder	Lifetime DSM-IV substance use disorder
Adjusted for demographics				
1. Acute racial (none = omitted)				
a. One event	1.37 (0.9 - 2.2)	1.04 (0.4 - 2.6)	1.28 (0.6 - 2.8)	2.31 (1.4 - 3.7)***
b. Two or more	2.26 (1.4 - 3.6)***	1.62 (0.8 - 3.3)	2.02 (1.0 - 4.0)*	2.31 (1.4 - 3.8)***
2. Acute non-racial (none = omitted)				
a. One event	1.48 (1.1 - 2.1)*	1.37 (0.8 - 2.2)	0.84 (0.5 - 1.4)	1.62 (1.1 - 2.5)*
b. Two or more	2.02 (1.4 - 2.8)***	1.41 (0.8 - 2.4)	1.94 (1.2 - 3.1)**	1.68 (1.1 - 2.5)**
3. Chronic racial discrim. (none = omitted)				
a. Any	1.28 (1.0 - 1.6)*	1.44 (0.9 - 2.3)	1.03 (0.7 - 1.5)	1.31 (1.0 - 1.8)
4. Chronic non-racial discrim. (none = omitted)				
a. Low	1.58 (1.3 - 1.9)***	1.64 (1.2 - 2.3)**	1.78 (1.4 - 2.3)***	1.34 (1.0 - 1.8)
b. High	2.32 (1.7 - 3.2)***	2.14 (1.5 - 3.2)***	2.60 (1.8 - 3.7)***	2.19 (1.5 - 3.2)***
Adjusted for other stressors				
1. Acute racial (none = omitted)				
a. One event	1.16 (0.7 - 1.9)	0.91 (0.4 - 2.3)	1.10 (0.5 - 2.5)	1.98 (1.2 - 3.2)**
b. Two or more	1.84 (1.2 - 2.9)**	1.36 (0.7 - 2.7)	1.70 (0.9 - 3.2)	1.87 (1.2 - 3.0)**
2. Acute non-racial (none = omitted)				
a. One event	1.18 (0.8 - 1.7)	1.12 (0.7 - 1.9)	0.70 (0.4 - 1.2)	1.31 (0.8 - 2.0)
b. Two or more	1.74 (1.2 - 2.5)**	1.25 (0.7 - 2.2)	1.70 (1.0 - 2.8)*	1.43 (0.9 - 2.2)
3. Chronic racial discrim. (none = omitted)				
a. Any	1.16 (0.9 - 1.5)	1.36 (0.9 - 2.1)	0.93 (0.7 - 1.3)	1.16 (0.8 - 1.6)
4. Chronic non-racial discrim. (none = omitted)				
a. Low	1.50 (1.2 - 1.9)***	1.58 (1.1 - 2.2)**	1.70 (1.3 - 2.2)***	1.28 (0.9 - 1.8)
b. High	1.89 (1.4 - 2.6)***	1.78 (1.2 - 2.6)**	2.10 (1.5 - 3.0)***	1.75 (1.2 - 2.5)**
Adjusted for psychological factors				
1. Acute racial (none = omitted)				
a. One event	1.21 (0.7 - 2.0)	0.98 (0.4 - 2.5)	1.17 (0.5 - 2.7)	1.98 (1.2 - 3.2)**
b. Two or more	1.87 (1.2 - 2.9)**	1.39 (0.7 - 2.8)	1.76 (0.9 - 3.3)	1.86 (1.2 - 3.0)**
2. Acute non-racial (none = omitted)				
a. One event	1.16 (0.8 - 1.7)	1.12 (0.7 - 1.9)	0.70 (0.4 - 1.2)	1.26 (0.8 - 1.9)
b. Two or more	1.72 (1.2 - 2.5)**	1.19 (0.7 - 2.1)	1.69 (1.0 - 2.8)*	1.46 (0.9 - 2.3)
3. Chronic racial discrim. (none = omitted)				
a. Any	1.10 (0.9 - 1.4)	1.36 (0.8 - 2.2)	0.90 (0.6 - 1.3)	1.06 (0.8 - 1.5)
4. Chronic non-racial discrim. (none = omitted)				
a. Low	1.44 (1.2 - 1.8)***	1.53 (1.1 - 2.2)*	1.63 (1.2 - 2.2)***	1.26 (0.9 - 1.7)
b. High	1.75 (1.3 - 2.4)***	1.68 (1.1 - 2.5)**	1.94 (1.4 - 2.7)***	1.72 (1.2 - 2.5)**

*$p \leq 0.05$.
**$p \leq 0.01$.
***$p \leq 0.001$.
Socio-demographics = age, sex, marital status, urban/rural location, race, education, income, natural resources, wealth and employment status. Other stressors: life events, relationship events, domestic violence, victimisation and perpetration; psychological factors = self-esteem, mastery and social desirability.
Values are percentages with standard errors in parentheses.

that stressful events have more negative effects on the mental health of socio-economically advantaged individuals than on their more disadvantaged counterparts.[12] Future research in South Africa needs to better understand the differential mental health effects of racial and non-racial discrimination. Disaggregating non-racial discrimination into its sub-types (e.g. age or gender) is also important for further inquiry.

South Africa has done much to address the legacy of discrimination in the redress of apartheid discriminatory laws, practices and institutions and has adopted wide-ranging transformative policies across sectors and disciplines. The South African Constitution of 1996 and its anti-discriminatory provisions and imperatives form the basis and preamble to the South African Health Act of 2004 and the Mental Health Care Act of 2002. Our findings suggest that discrimination may nonetheless still matter for mental health. Identifying effective strategies to address the legacies of racism, and levels of incivility and intolerance more generally, may therefore be important to promote mental health. The need for increased resources and capacity for mental health interventions has been identified.[19] Addressing the stress created by racial and non-racial discrimination must be included in comprehensive efforts to address mental health.

Our analyses have several limitations. The SASH study is retrospective and cross-sectional. We cannot identify temporal ordering of the associations, and recall bias can affect the validity of both the assessment of discrimination and mental health. South African racial groups in the apartheid era probably experienced discrimination differentially, and our lack of detailed contextual information on the nature of interpersonal discrimination and the identity of the perpetrator limit our understanding of the potentially pathogenic features of interpersonal racism. The measures of discrimination may have also failed to capture all relevant experiences. Specifically, the measures of acute discrimination in this study do not encompass the range of unfair treatment experienced, such as travel restrictions, negative mixed marriage experiences and human rights violations. Additionally, although the measure of psychiatric disorders has been used in more than 20 countries, representing all of the WHO regions,[13] and was carefully translated and back-translated with the assistance of local language experts, it was not specifically clinically validated for South Africa. We are therefore not sure of the extent to which our measures capture psychiatric disorders across the diverse social and cultural groups that constitute the South African population.

Despite these limitations, analyses of the association between perceptions of discrimination and psychiatric disorders in the first nationally representative psychiatric epidemiological study in sub-Saharan Africa suggest that discrimination may be a risk factor for mental illness. Future research should seek to replicate and better understand these associations, and mental health policy needs to give greater attention to identifying the individual and organisational interventions that can reduce the levels and potentially negative consequences of racial and non-racial discrimination.

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References

1. Fredrickson GM, Knobel DT. A history of discrimination. In: Thernstrom S, Orlov A, Handlin O, eds. *Prejudice: Dimensions of Ethnicity*. Cambridge, MA: Harvard University Press, 1982: 31.
2. Pettigrew TF, Taylor MC. Discrimination. In: Borgatta EF, Borgatta, ML, eds. *Encyclopedia of Sociology*. New York: Macmillan, 1990, Vol. 1: 498-503.
3. Al-Issa I. The psychology of prejudice and discrimination. In: Al-Issa I, Tousignant M, eds. *Ethnicity, Immigration, and Psychopathology*. New York: Plenum Press, 1997: 17-32.
4. Hampton MB, Heywood JS. Do workers accurately perceive gender wage discrimination? *Industrial and Labor Relations Review* 1993; 47(1): 36-49.
5. Paradies Y. A systematic review of empirical research on self reported racism and health. *Int J Epidemiol* 2006; 35(4): 888-901.
6. Williams DR, Mohammed SA. Discrimination and racial disparities in health: evidence and needed research. *J Behav Med* 2009; 32(1): 20-47.
7. Dommisse J. The psychological effects of apartheid psychoanalysis: social, moral and political influences. *Int J Soc Psychiatry* 1986; 32: 51-63.
8. Mohutsioa-Makhudu YNK. Counseling in South Africa: The challenge of Apartheid. The psychological effects of Apartheid on the mental health of black South African women domestics. *Journal of Multicultural Counseling and Development* 1989; 17: 134-142.
9. Williams DR, Gonzalez, HM, Williams S, Mohammed SA, Moomal H, Stein DJ. Perceived discrimination, race and health in South Africa. *Soc Sci Med* 2008; 67: 441-452.
10. Williams DR, Herman A, Kessler RC, *et al*. The South Africa Stress and Health Study: rationale and design. *Metab Brain Dis* 2004; 19(1-2): 135-147.
11. Kessler RC, Mickelson KD, Williams DR. The prevalence, distribution, and mental health correlates of perceived discrimination in the United States. *J Health Soc Behav* 1999; 40: 208-230.
12. Williams DR, Yu Y, Jackson J, Anderson N. Racial differences in physical and mental health: socioeconomic status, stress, and discrimination. *J Health Psychol* 1997; 2(3): 335-351.
13. Kessler RC, Ustün TB. The World Mental Health (WMH) Survey Initiative Version of the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI). *Int J Methods Psychiatr Res* 2004; 13(2): 93-121.
14. Rosenberg M. *Conceiving the Self*. New York: Basic Books, 1979.
15. Pearlin L, Lieberman M, Menaghan E, Mullan J. The stress process. *J Health Soc Behav* 1981; 22: 337-356.
16. Zuckerman M, Kuhlman DM, Joireman J, Teta P. A comparison of three structural models for personality: the big three, the big five, and the alternative five. *J Pers Soc Psychol* 1993; 65(4): 757-768.
17. Haro JM, Arbabzadeh-Bouchez S, Brugha TS, *et al*. Concordance of the Composite International Diagnostic Interview Version 3.0 (CIDI 3.0) with standardized clinical assessments in the WHO World Mental Health Surveys. *International Journal of Methods in Psychiatric Research* 2006; 15: 167-180.
18. Andrew G, Peters L. The psychometric properties of the Composite International Diagnostic Interview. *Soc Psychiatry Psychiatr Epidemiol* 1998; 33: 80-88.
19. Sharan P, Levev I, Olifson S, de Francisco A, Saxena S, eds. *Research Capacity for Mental Health in Low and Middle-Income Countries: Results of a Mapping Project*. Geneva: World Health Organization and Global Forum for Health Research, 2007.

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