

Running title: Psychological distress

Psychological distress among a cross-sectional national sample of adolescents in South Africa: Prevalence and associated factors

Supa Pengpid^{1,2} Karl Peltzer²

¹ASEAN Institute for Health Development, Mahidol University, Salaya, Phutthamonthon, Nakhon Pathom, Thailand

²Department of Research Administration and Development, University of Limpopo, Polokwane, South Africa

Corresponding author: Karl Peltzer, Department of Research Administration and Development, University of Limpopo, Polokwane, South Africa; Email: kfpeltzer@gmail.com

Abstract

Psychological distress (PD) may be common among adolescents. The study aimed to estimate population-based rates of PD among adolescents in South Africa. National cross-sectional data were analysed from 2,240 adolescents (17 years median age) that participated in a community-based population survey, the “2012 South African National Health and Nutrition Examination Survey (SANHANES-1).” Results indicated that 16.0% of the adolescents had PD, 13.1% among boys and 18.5% among girls. In adjusted logistic regression analysis, increasing age, girls, belonging to the Black African population group, having experienced two or more traumatic life events, poor self-rated health status, having activity limitations, perceived body overweight, fast food and snack consumption were associated with PD. Almost one in six adolescents in South Africa reported PD and several associated factors were identified.

Key words: psychological distress, household survey, adolescents, South Africa

Background

During childhood and adolescence mental problems may first develop, contributing to a significant mental health burden globally,^{1,2} and making the adolescent period a crucial age to develop mental health interventions.³ According to the “American Psychological Association (APA, p1),”⁴ psychological distress (PD) is “a set of painful mental and physical symptoms that are associated with normal fluctuations of mood in most people. It is considered what is assessed

by many putative self-report measures of depression and anxiety.” Screening measures for PD include, for example, the “Psychological Distress Scale”, K-6 or K-10 (assessing symptoms of stress, anxiety, and depression),^{5,6} and the “General Health Questionnaire (GHQ-12).”⁷

In community-based studies among adolescents, the prevalence of PD (K-10) was 23.0% in Tanzania⁸ and 10.5% in India.⁹ In a sample of school adolescents in a province in Northeast of China, the prevalence of PD (K-10) was 27.9%.¹⁰ In a national survey among adolescents in Japan, the prevalence of PD (K-6) was 10.7% in 2007 and 7.6% in 2013,¹¹ 35.1% (GHQ) in Canada,¹² and 24.2% (GHQ) in Nigeria.¹³ Ajaero et al.¹⁴ found that the prevalence of depression among adolescents in a national sample in South Africa was 14.6% among urban and 9.4% among rural adolescents. In a sample of non-pregnant 18-22 year-old women (N=926) in South Africa, the prevalence of PD (GHQ-28), was 18% among rural and 34% among urban participants.¹⁵ There are no national data on PD among adolescents in South Africa, which are needed to prevent and control PD.¹⁶

Risk factors for PD, as reviewed previously,^{17,18} may include “sociodemographic factors (older age, female sex), social distresses (interpersonal violence, experience of hunger, low peer and low parental support) and health risk behaviours (poor diet, substance use, sedentary behaviour, sexual behaviour and injury).” The study aimed to estimate population-based rates of PD among adolescents in South Africa.

Methods

Sources of data

A subsample (adolescents, 15-19 years, with complete PD measure) of the cross-sectional national data from the “2012 South African National Health and Nutrition Examination Survey (SANHANES-1)” were analysed.¹⁹ More detailed methods and data can be accessed.¹⁹

Measures

Outcome variable

PD in the past 30 days was measured using the Kessler 10 (K-10), consisting of 10 questions⁶ (Cronbach alpha 0.90 in this sample). Total scores 18 or more indicated PD among adolescents.²⁰

Socio-demographic variables included population group, age, sex, work status and residence.

Social distress variables

Experience of 14 trauma events, e.g., “severe automobile accidents” and “learned about the sudden, unexpected death of a family member or a close friend?”¹⁹

Daily secondary smoke exposure was assessed with the question, “How often does anyone smoke inside your home?”¹⁹

Poor self-rated health status was classified as moderate, bad or very bad.

Activity limitation was sourced from the item: “Overall, in the last 30 days, how much difficulty did you have with school, work or household activities?”¹⁹

Perceived body weight was sourced from the question, “Do you think you are Underweight, Normal weight, or Overweight?”¹⁹

Health risk behaviour

Current tobacco use was measured with questions on smoking and other tobacco products.¹⁹

Problem drinking was sourced from the “*Alcohol Use Disorders Identification Test–Consumption (AUDIT-C)*”²¹ (Cronbach alpha 0.89 in this sample). Scores of three or more were classified as problem drinking in adolescents.²²

Physical activity was measured with “General Physical Activity Questionnaire (GPAQ)”, and classified into “low, moderate or high physical activity.”^{23,24}

Sedentary behaviour was measured with “two questions on the time spent sitting or reclining (lying) on a usual weekday or weekend day (excluding sleeping).”²⁵

Fruit consumption. “How many fruits do you usually eat per day?” *Vegetable consumption*.

“How many portions of vegetables, excluding potatoes, do you usually eat per day?”

Response options were “1= 4 or more per day, 2=1-3 per day, 3=not every day, but 4 or more a week, 4=not every day, but less than 4 per week, and 5=none.”¹⁹

Other dietary items in the past week included “Food from fast food outlets (take-aways, e.g., pizza, chicken, fish, etc.)?” “Sweetened cold drinks (gas/fizzy cold drink and reconstituted) and sweetened fruit juice?” and “Snacks such as chips/crisps, mazimba, etc.?” Response options were “1=none, 2=every day, 3=1-3 times last week, and 4=4-6 times last week.”¹⁹

Ethical considerations

The study protocol was approved by the “research ethics committee (REC) of the Human Sciences Research Council (REC 6/16/11/11)”, and informed written consent was obtained from participants.

Data analysis

Statistical analyses were done with “STATA software version 15.0 (Stata Corporation, College Station, Texas, USA),” Univariate and multivariable (with variables significant at $P < 0.08$ in univariate analysis) logistic regression analyses predicted estimates of PD. The significant level was set at $p < 0.05$. Missing values were excluded from the statistical analysis.

Results

Sample and PD characteristics

The sample comprised of 2,240 adolescents (17 years median age, 2 years interquartile range), 51.4% were female, 76.8% were attending school, 73.5% belonged to the Black African population group and 60.6% lived in urban areas. Almost one in seven participants (13.1%) had experienced one or more traumatic life events, 18.6% were daily exposed to secondary smoke, 11.6% rated their health status as poor (moderate, bad or very bad), 4.5% had moderate to severe activity limitations and 8.5% perceived themselves to be having overweight. More than one in ten adolescents (12.1%) engaged in problem drinking, 7.6% in current tobacco use, 40.1% inadequate physical activity, 10.4% spent ≥ 8 hours/day sedentary, 42.5% had fruits (< 1 /day) and 45.1% vegetables (< 1 /day), 46.6% had fast food in the past week, 23.3% had soft drinks or sweet juice daily and 25.9% had four or more times a week snacks. Almost one in six adolescents (16.0%) reported PD, 18.5% among girls and 13.1% among boys (see Table 1).

Table 1: Sample and psychological distress characteristics

Variable	Sample	Psychological distress	P-value
Socio-demographics			
All	2240	359 (16.0)	
Age in years			
15-16	850 (37.9)	102 (12.0)	<0.001
17-19	1390 (62.1)	257 (18.5)	
Gender			
Female	1143 (51.4)	212 (18.5)	<0.001
Male	1080 (48.6)	142 (13.1)	
Work status			
Student	1689 (76.8)	249 (14.7)	<0.001
Working	107 (4.9)	16 (15.0)	
Not working and other	404 (18.4)	83 (20.5)	

Population group			
Other (White/Coloured/Asian)	587 (26.5)	66 (11.2)	<0.001
Black African	1628 (73.5)	287 (16.8)	
Residence			
Rural	882 (39.4)	146 (16.6)	0.156
Urban	1358 (60.6)	213 (15.7)	
Social distress			
Traumatic life events			
0	1888 (86.9)	272 (14.4)	<0.001
1	120 (5.5)	24 (20.0)	
2 or more	165 (7.6)	50 (30.3)	
Secondary smoke (daily)	404 (18.6)	78 (19.3)	0.149
Self-rated health status (poor=moderate/bad/very bad)	258 (11.6)	65 (25.2)	<0.001
Activity limitation (moderate/severe)	100 (4.5)	39 (39.0)	<0.001
Body overweight perception	189 (8.5)	42 (22.2)	0.015
Health risk behaviour			
Current tobacco use	67 (7.6)	30 (18.0)	0.236
Problem drinking	268 (12.1)	64 (23.9)	0.070
Physical activity			
Low	867 (40.1)	133 (15.2)	0.638
Moderate	514 (23.8)	45 (14.0)	
High	779 (36.1)	162 (16.8)	
Sedentary behaviour			
Low (<4 hrs/day)	1056 (53.4)	161 (15.2)	0.823
Moderate (4-7 hrs/day)	716 (36.2)	124 (17.3)	
High (≥8 hrs/day)	206 (10.4)	26 (12.6)	
Fruits (less once/day)	931 (42.5)	146 (15.7)	0.636
Vegetables (less once/day)	979 (45.1)	178 (18.2)	0.353
Fast foods (1 or more times/week)	1035 (46.6)	187 (18.1)	0.078
Soft drinks or sweet juice (daily)	507 (23.3)	101 (19.9)	0.293
Snacks (≥4 times/week)	575 (25.9)	120 (20.9)	<0.068

Associations with PD

In adjusted logistic regression analysis, increasing age, girls, belonging to the Black African population group, having experienced two or more traumatic life events, poor self-rated health status, having activity limitations, perceived body overweight, fast food and snack consumption were associated with PD (see Table 2).

Table 2: Associations with psychological distress

Variable	Adjusted Odds Ratio (95% CI)
Socio-demographics	
Age in years	
15-16	1 (Reference)
17-19	1.60 (1.42, 1.87)**
Gender	
Female	1 (Reference)

Male	0.56 (0.38, 0.81)**
Work status	
Student	1 (Reference)
Working	0.47 (0.16, 1.40)
Not working and other	1.24 (0.79, 1.95)
Population group	
Other (White/Coloured/Asian)	1 (Reference)
Black African	3.12 (1.78, 5.45)***
Social distress	
Traumatic life events	
0	1 (Reference)
1	1.43 (0.75, 2.70)
2 or more	2.57 (1.38, 4.77)**
Secondary smoke (daily)	1.27 (0.90, 1.77)
Self-rated health status (poor=moderate/bad/very bad)	1.61 (1.13, 2.31)**
Activity limitation (moderate/severe)	3.85 (1.72, 8.61)***
Body overweight perception	1.84 (1.05, 3.23)*
Health risk behaviour	
Current tobacco use	1.82 (0.93, 3.54)
Problem drinking	1.43 (0.82, 2.48)
Fast foods (1 or more times/week)	1.65 (1.12, 2.45)*
Snacks (≥ 4 times/week)	1.45 (1.10, 1.91)**

***P<.001; **P<.01; *P<.05; CI=Confidence Interval

Discussion

In this national household survey among adolescents in South Africa, the prevalence of past month PD (16.0%) in this study was lower than in Tanzania (23.0%),⁸ Nigeria (24.2%),¹³ Canada (35.1%),¹² China (40.1%)¹⁰ and higher than in India (10.5%)⁹ and Japan (<10%).¹¹ A previous population-based study among adolescents in the South Africa reporting a high proportion of depressive symptoms seem to confirm that PD is common.¹⁴

Consistent with previous research,²⁶ female sex was associated with PD, which may be attributed to girls internalising problems such as PD more likely than boys do.^{3,27,28} Increasing age was associated with PD in this study, which is consistent with research among adolescents in India and South Africa.^{9,14} Older adolescents are more likely to have greater demands than younger adolescents contributing to higher PD.^{3,29,30} The study did not find any significant difference in the prevalence of PD between rural and urban adolescents, while in a previous study among adolescents in South Africa the prevalence of depression was almost double as high in urban than rural adolescents.¹⁴ In unadjusted analysis, compared to being a student or working, the prevalence of PD was higher among adolescents who were not working or unemployed, which is confirming the positive relationship between unemployment and PD.³¹ Compared to White, Coloured or Asian adolescents, Black

African adolescents had a significantly higher prevalence of PD. Interventions may want to take the different rates of PD by sociodemographic and population group factors into account.

In line with former research findings,^{10,15,18,32,33} this survey showed that having social distress, such as having experienced multiple traumatic life events, having activity limitations, poor self-rated health status and perceived body overweight increased the odds for PD. Exposure to stressful life events has been shown to be associated with the development of PD.³⁴ The study confirms the cumulative effects of traumatic effects on PD and shows the importance of the history of traumatic life events in the management of PD among adolescents in South Africa.³² In a behavioural risk survey among adults in the US, frequent activity limitation was associated with having PD,³⁵ which was also found in this study among adolescents. In this survey, under the present employment situation, 21 adolescents reported that they are sick or disabled and unable to work. In the assessment of mental health or PD in this adolescent population, possible activity limitations should be assessed and integrated into the management. Some research among adolescents^{36,37} seems to show that obesity is associated with the development of mental disorders, such as depression, and that the relationship between obesity and depression appears to be bidirectional. In addition, perceived body overweight seems to have a greater negative mental health impact, such depression, than actual overweight, as found in a study among Korean adolescents.³⁸

In terms of health risk behaviours, fast food and snack consumption, and in unadjusted analysis, problem drinking (marginally significantly) increased the likelihood of having PD. These results are consistent with some previous research.^{39,40} It has been proposed that as a result of fast food consumption, snacks and sweets levels of inflammation increase leading to poorer mental health.⁴⁰ Unlike some previous investigations,^{12,41-45} this study did not show significant association between passive smoking, sedentary behaviour, soft drink intake, inadequate fruit and vegetable intake and PD.

Study limitations

Study limitations include self-reported and cross-sectional data. An additional limitation was that family and peer environmental variables were not assessed and should be made part of future studies.

Conclusion

The study found among a national sample of adolescents in South Africa that almost one in six adolescents reported PD. Several risk factors, including increasing age, girls, belonging to

the Black African population group, having experienced two or more traumatic life events, poor self-rated health status, having activity limitations, perceived body overweight, fast food and snack consumption, were identified for PD, which can assist in guiding interventions to prevent PD in this adolescent school population.

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Competing interests

“The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.”

Authors’ contributions

S.P. and K.P. designed and conducted the analyses and wrote the draft article and all authors read and approved the final article.

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Data availability statement

Data of the South African National Health and Nutrition Examination Survey (SANHANES-1) 2011–12 are available at <http://datacuration.hsrc.ac.za>.

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