



Analysis of risk and protective factors for psychosocial distress among in-school adolescents in Tanzania

Abdul-Aziz Seidu¹ · Bright Opoku Ahinkorah² · Louis Kobina Dadzie¹ · Edward Kwabena Ameyaw² · Eugene Budu¹

Received: 29 April 2019 / Accepted: 12 December 2019 / Published online: 3 January 2020
© Springer-Verlag GmbH Germany, part of Springer Nature 2020

Abstract

Introduction Psychosocial distress has emerged as one of the world's major public health problems, especially among adolescents in both low- and middle-income countries. This study used data from the 2015 version of the Global School-Based Health Survey to determine the risk and protective factors for psychosocial distress among in-school adolescents in Tanzania.

Materials and methods Chi-square and logistic regression analyses were used to estimate the magnitude of associations. A total of 2936 students participated in the study, of which 52.3% were female.

Results Psychosocial distress was found in 16.9% of the students at similar rates for both males and females. The risk factors associated with psychosocial distress were hunger (OR = 1.57, $p < 0.001$), being bullied (OR = 1.92, $p < 0.001$), being attacked (OR = 1.31, $p < 0.05$), engaging in physical activity (OR = 1.33, $p < 0.05$), truancy (OR = 1.28, $p < 0.05$) and tobacco use (OR = 2.40, $p < 0.01$). However, the protective factors were grade (OR = 0.55, $p < 0.01$) and having one or two (OR = 0.56, $p < 0.01$) and three or more close friends (OR = 0.57, $p < 0.01$).

Conclusions The prevalence of psychosocial distress among adolescents in Tanzania is relatively high and appears to be common among both sexes. To reduce psychosocial distress among in-school adolescents, more attention needs to be paid to the risk factors while encouraging healthy relationships among adolescents and their close friends.

Keywords Tanzania · Psychosocial distress · Adolescents

Background

Psychosocial distress has emerged as one of the major public health problems, especially among adolescents in both low-

and middle-income countries worldwide (Beattie et al. 2019; De Silva et al. 2007). Globally, the World Health Organization (WHO) estimates that one in four people suffer psychosocial distress at some point in their lives (WHO 2011). Common mental health disorders, such as depression and anxiety, often emerge during adolescence, with many persisting across the life course (Patton et al. 2014; Patel 2013). Psychosocial distress as a concept has been viewed from different fields and disciplines such as biomedical, psychological, sociological and environmental. Due to these perspectives, it can be operationalized differently and has been considered for instance as a major life event, chronic strain, day-to-day hassle and trauma (Beutel et al. 2018).

There have been differences in the estimations of the prevalence rates for psychosocial distress across various studies due to the divergent definitions used to measure it. For example, in some studies psychosocial distress was assessed using four mental health indicators, namely loneliness, anxiety or worry, sadness and suicide plan (Pengpid and Peltzer 2013; Page and Hall 2009; Siziya and Mazaba 2015). In another study, Hong et al. (2013) defined

✉ Abdul-Aziz Seidu
abdul-aziz.seidu@stu.ucc.edu.gh

Bright Opoku Ahinkorah
brightahinkorah@gmail.com

Louis Kobina Dadzie
louis.dadzie1@stu.ucc.edu.gh

Edward Kwabena Ameyaw
edmeaw19@gmail.com

Eugene Budu
budueugene@gmail.com

¹ Department of Population and Health, University of Cape Coast, Cape Coast, Ghana

² The Australian Centre for Public and Population Health Research (ACPPHR), Faculty of Health, University of Technology Sydney, Sydney, Australia

psychosocial distress using five indicators of alcohol intoxication, drug use, suicidal behaviour, depression and loneliness. Similarly, Page et al. (2011) used five measures (loneliness, suicidal plan, no close friends, worry and sadness/hopelessness) to create a composite index for measuring psychosocial distress. Likewise, Henderson et al. (2013) also used three different measures to create a composite index for assessing psychosocial distress (self-perceived stress, neuroticism and dissatisfaction). However, Stevenson et al. (2012) used 29 questions from the Falk Self-Reporting Questionnaire to calculate psychosocial distress by summing each respondent's answer. In this study, psychological distress was measured with the three indicators thus loneliness, suicidal plan and anxiety.

The prevalence of psychosocial distress among adolescents could be as high as 67.7% (71.2% among boys and 63.3% in girls) as reported from Iran (Qorbani et al. 2014), 35% among adolescent girls in India (Beattie et al. 2019) and 15.7% (14.4% of males and 16.8% of females) in Zambia (Siziya and Mazaba 2015) to as low as 2.5% (2.0% among boys and 3.0% girls) in Thailand (Pengpid and Peltzer 2013). Several factors have been found to be associated with psychosocial distress. They include age, sex, parental support, substance use and sexual behaviour (Siziya and Mazaba 2015). These factors have also been grouped into risk and protective factors (Siziya and Mazaba 2015; Pengpid and Peltzer 2013). With the protective factors, it has been established that living with both parents and good parent-teen connectedness, peer support, younger age and having close friends are protective factors against psychosocial distress (Shiferaw et al. 2006). The reported risk factors, on the other hand, include substance use (Page et al. 2011; Siziya and Mazaba 2015), older age, being bullied, being attacked, engaging in fights (Siziya and Mazaba 2015) and having multiple sexual partners (Page and Hall 2009). Although psychosocial distress among adolescents is increasing, information on the correlates for psychosocial distress in Tanzania remains scanty. As argued by Kleppang et al. (2017), if preventive strategies are to be effective, then a better understanding of risk and protective factors is required. The present study seeks to fill this empirical gap by determining the prevalence as well as risk and protective factors for psychosocial distress among in-school adolescents in Tanzania.

The Transactional Model of Stress and Coping (TMSC), developed by Lazarus and Folkman (1991), guided this work. This model has been employed to study psychosocial distress among adolescents in various fields and settings (Mutumba et al. 2017; Wethington et al. 2015) and allows examination of the relationships between the risk and protective factors that impact adolescent mental well-being. There are three key concepts in the model—stressors, coping efforts and psychosocial resources. Stressors are defined as 'demands made by the

internal or external environment that upset balance, thus affecting physical and psychological well-being, and requiring action (coping efforts) to restore balance'. In the model, how a person copes with a stressor is crucial to their physical, social and psychological well-being. Coping efforts are conceptualized as the actual strategies adopted to manage the emotional and/or physiological effects of stressors; deficits in these actions result in psychological distress. Finally, psychosocial resources are defined as the psychological, social and cultural assets at a person's disposal that are deployed to reduce or eliminate stressors (Mutumba et al. 2017). Evidence suggests that the trends of psychosocial distress are complex (Sweeting et al. 2010) and that they have not only increased since the 1950s (Bynner et al. 2002), but also reflect a reduction in the age at which psychosocial distress sets in (Fombonne 1998). Psychosocial distress in adolescence has a strong continuity with adulthood disorders and has been shown to contribute to a significant proportion of adult psychiatric morbidity (Fryers and Brugha 2013).

Materials and methods

Description of the survey

The 2015 Tanzania Global School-Based Student Health Survey (T-GSHS) was used in this study. It is part of the WHO/Centre for Disease Control questionnaire survey conducted in different countries, primarily among students aged 13–17 years. In Tanzania, the first T-GSHS was conducted in the Dar es Salaam region. The Global School-based Health Survey generally measures behaviours and protective factors related to the leading causes of mortality and morbidity among youths and adults, including alcohol and other drug use, dietary behaviours, hygiene, mental health, physical activity, protective factors (not cause of mortality/morbidity), sexual behaviour, tobacco use, violence and unintentional injury. These data can help countries to develop priorities, establish school and youth health programmes, and advocate for resources for implementing and evaluating programmes and to make comparisons with other countries. Details of the survey procedures, sampling and questionnaires used can be found in the final report (T-GSHS Report 2017). The principles of anonymity and voluntary participation were followed. The student response rate was 87%. Overall, 3797 of the 4373 sampled students completed questionnaires, of which 3793 were usable after data editing (T-GSHS Report, 2017 p5). In this study, 2936 students who had complete cases for the variables we used for the study formed our sample. The data set is freely available to download at: <https://www.who.int/ncds/surveillance/gshs/tanzaniadataset/en/>.

Measures and response coding

Dependent variable

The outcome variable “psychosocial distress” was assessed using three mental health indicators, namely loneliness, anxiety and suicide plan, based on previous research on a similar school-going adolescent population (Beattie et al. 2019; Pengpid and Peltzer 2013; Page et al. 2011; Siziya and Mazaba 2015). The original responses to loneliness and anxiety were transformed to dichotomous responses where 0 = no and 1 = yes. Suicidal plan was already a dichotomous variable. From these, an index was created whereby respondents with two or three of the mental health indicators were classified as having psychosocial distress (Siziya and Mazaba 2015).

Independent variables

Seventeen independent variables were included in the estimations. These comprised age, sex, grade, socioeconomic status (as measured by experience of hunger), being bullied, engaging in fights, alcohol use, being physically attacked, tobacco use, physical activity, truancy, ever smoked, number of close friends, getting help from friends, parental bonding, parental connectedness and parental or guardian supervision. The variables were selected based on their availability in the T-GSHS data set and previous studies (Beattie et al. 2019; Pengpid and Peltzer 2013; Siziya and Mazaba 2015), which found them to be predictors of psychosocial distress. Detailed descriptions of the variables are presented in Table 1.

Statistical analysis

Data analysis was performed using STATA version 14.2 software for Mac OS. The outcome variable was psychosocial distress. Due to the nature of the study design, a weighting factor was used to reflect the likelihood of sampling each pupil and to reduce bias by compensating for differing patterns of non-response. First, a descriptive analysis was done to describe the general characteristics of the study population. Second, we explored the differences in reported psychosocial distress against the independent variables and reported *p*-values of Pearson’s chi-square (see Table 2). Multivariable analysis in the form of binary logistic regression analysis was performed to determine the association between the independent variables and psychosocial distress (see Table 3). Sex and age have been identified in some studies as being associated with psychosocial distress (Siziya and Mazaba 2015). Due to this they were our key independent variables. Aside from age and sex, the other independent variables with a *p* value < 0.05 were included in the multivariable analysis. The results from the regression analyses were presented as odds ratios (ORs)

and their corresponding confidence intervals. The reference categories for all the independent variables were informed by previous studies (Beattie et al. 2019; Pengpid and Peltzer 2013; Siziya and Mazaba 2015) and a priori. Variables with complete cases were used for the analysis.

Results

Descriptive and bivariate analysis

As shown in Table 2, the majority of the adolescents (53.7%) were aged 11 to 14 years. The proportions of male and female were approximately 48% and 52%, respectively. More than half of the adolescents (54%) were grade 6 and 7 students with the fewest (10.4%) in Form 1. About two-thirds (76.2%) of the respondents indicated that they had not gone hungry in the past 30 days, with “only” 23.8% indicating otherwise. Only 2.3% of adolescents reported using tobacco in the past 30 days. About a quarter of the respondents (25.1%) indicated fighting in the past 12 months. The prevalence of psychosocial distress was 16.9% among in-school adolescents in Tanzania. The chi-square analysis showed that grade, hunger, being bullied, fighting, being attacked, physical activity, truancy, alcohol use, tobacco use, smoking, number of close friends, peer support and parental supervision were associated with psychosocial distress among adolescents (see Table 2).

Multivariable analysis

The results of the logistic regression analysis are presented in Table 3. Adolescents who had gone hungry in the past 30 days had higher odds of experiencing psychosocial distress (OR = 1.57, *p* < 0.001) compared with those who had not gone hungry. Moreover, students who were bullied (OR = 1.92, *p* < 0.001), attacked (OR = 1.31, *p* < 0.05), engaged in physical activity 4 or more days per week (OR = 1.33, *p* < 0.05) or truant (OR = 1.28, *p* < 0.05) as well as tobacco users (OR = 2.4, *p* < 0.01) had higher odds of experiencing psychosocial distress (see Table 3). On the contrary, in-school adolescents who indicated that they had 1 or 2 friends (OR = 0.56, *p* < 0.01) or 3 or more friends (OR = 0.57, *p* < 0.01), as well as adolescents who were in Form 2, had lower odds (OR = 0.55, *p* < 0.01) of experiencing psychosocial distress compared with students who had no close friends and were in grade 6 and 7 respectively.

Discussion

This study sought to determine the prevalence of, as well as risk and protective factors for, psychosocial distress among

Table 1 Description of the study variables and their response coding

Variable	Question	Response options and recoding
Outcome variable		
Psychosocial distress	Assessed using three mental health measures	0–3 (Coded as 1 = 2 or 3 and 0 ≤ 2)
Loneliness	During the past 12 months, how often have you felt lonely?	1 = never, 2 = rarely, 3 = sometimes, 4 = most of the time to 5 = always (Coded as 0 = 1 and 1 = 2–5)
Anxiety	During the past 12 months, how often have you been so worried about something that you could not sleep at night?	1 = never to 5 = always (Coded 0 = 1–3 and 1 = 4–5)
Suicide plan	During the past 12 months, did you make a plan about how you would attempt suicide?	1 = yes, 2 = no (Coded as 1 = yes and 0 = no)
Independent variables		
Age	Age of respondent	1 = 12, 2 = 13, 3 = 14, 4 = 15, 5 = 16, 6 = 17, 7 = 18 years (Coded as 0 = 12–17, 1 = 18+)
Sex	Sex	1 = male, 2 = female
Grade	What grade are you in?(school system)	1 = Grade 6, 2 = Grade 7, 3 = Form 1, 4 = Form 2, 5 = Form 3 (Coded as 1 = Form 6–7, 2 = Form 1, 3 = form 2, 4 = Form 3)
Hunger	Went hungry in past 30 days?	1 = never, 2 = rarely, 3 = sometimes, 4 = most of the times, 5 = always (Coded 0 = 1, 1 = 2–5)
Alcohol use	During the past 30 days, on how many days did you have at least one drink containing alcohol?	1 = 0 days to 7 = all 30 days (Coded as 0 = 1 and 1 = 2–7)
Smoking	During the past 30 days, on how many days did you smoke at least one cigarette?	1 = 0 days to 7 = all 30 days (Coded as 0 = 1 and 1 = 2–7)
Use of other form of tobacco	During the past 30 days, on how many days did you use any other form of tobacco, such as chewing tobacco leaves?	1 = 0 days to 7 = all 30 days (Coded as 0 = 1 and 1 = 2–7)
Fighting	During the past 12 months, how many times were you involved in a physical fight?	1 = 0 times to 8 = 12 or more times (Coded as 0 = 1 and 1 = 2–8)
Bullied	During the past 30 days, how often were you bullied?	1 = 0 times to 8 = 12 or more times (Coded 0 = 1 and 1 = 2–7)
Close friends	How many close friends do you have?	1 = 0 to 4 = 3 or more (Coded as 0 = 1, 1 = 2, 2 = 3 or more)
Truancy	During the past 30 days, on how many days did you miss classes or school without permission?	1 = 0 days, 2 = 1 or 2 days, 3 = 3 to 5 days, 4 = 6 to 9 days, 5 = 10 or more (Coded as 0 = 1 and 1 = 2–5)
Attacked	During the past 12 months, how many times were you physically attacked?	1 = 0 days, 2 = 1 or 2 days, 3 = 3 to 5 days, 4 = 6 to 9 days, 5 = 10 or more (Coded as 0 = 1 and 1 = 2–5)
Physical activity	During the past 7 days, on how many days were you physically active for a total of at least 60 min?	1 = 0 days to 8 = 7 days (Coded as 1 = 5 or more days and 0 = 0–4 days)
Helpful	During the past 30 days, how often were most of the students in your school kind and helpful?	1 = never, 2 = rarely, 3 = sometimes, 4 = most of the times, 5 = always (Coded as 0 = 1 and 1 = 2–5)
Parental supervision	During the past 30 days, how often did your parents or guardians check to see if your homework was done?	1 = never, 2 = rarely, 3 = sometimes, 4 = most of the times, 5 = always (Coded as 0 = 1 and 1 = 2–5)
Parental connectedness	During the past 30 days, how often did your parents or guardians understand your problems and worries?	1 = never, 2 = rarely, 3 = sometimes, 4 = most of the times, 5 = always (Coded as 0 = 1 and 1 = 2–5)
Parental bonding	During the past 30 days, how often did your parents or guardians really know what you were doing with your free time?	1 = never, 2 = rarely, 3 = sometimes, 4 = most of the times, 5 = always (Coded as 0 = 1 and 1 = 2–5)

adolescents in Tanzania using data from the 2015 T-GSHS. It found that psychosocial distress was detected in 16.9% of the participants. The study findings are similar to the 15.7% found by Siziya and Mazaba (2015) in Zambia, but far lower than the 67.7% found by Qorbani et al. (2014) in Iran. However, the rate in the current study was higher than the one reported in Thailand by Peltzer and Pengpid (2015) of 2.5% overall (2.0% among boys and 3.0% among girls). Possible reasons for the differences in the prevalence of psychosocial distress could be partly due to the diverse ways in which it was measured in the various studies. For

example, the Iranian study assessed psychosocial distress using seven questions which examined feelings of worthlessness, anger, anxiety, insomnia, confusion, sadness and worry, with those with at least four of the seven items (57% or more) being considered psychosocially distressed. In the present study, on the other hand, three mental health indicators, namely loneliness, anxiety and suicide plan, were used to define psychosocial distress, and respondents with three items (75% or more) were considered distressed. This difference in cut-off points for distress may partly explain the observed different rates of psychosocial distress.

Table 2 Background characteristics of respondents and prevalence of psychosocial distress

Variables			Psychosocial distress <i>N</i> = 2936		Chi-square (X^2) (<i>p</i> value)
	Frequency	Percent	No (%)	Yes (%)	
Prevalence			(83.1)	(16.9)	
Age in years					0.59 (0.444)
11–14	1576	53.7	82.6	17.4	
15+	1360	46.3	83.7	16.3	
Sex					0.0010 (0.985)
Male	1401	47.7	83.1	16.9	
Female	1535	52.3	83.1	16.9	
Grade					13.51(0.004)
6–7	1575	53.6	81.5	18.5	
Form 1	305	10.4	84.6	15.4	
Form 2	477	16.3	88.5	11.5	
Form 3	579	19.7	82.4	17.6	
Hunger					43.02 (0.000)
No	2236	76.2	85.6	14.4	
Yes	700	23.8	75.0	25.0	
Bullied					80.21 (0.000)
No	2254	76.8	86.5	13.5	
Yes	682	23.2	71.9	28.2	
Fighting					15.19 (0.000)
No	2198	74.9	84.7	15.3	
Yes	738	25.1	78.5	21.5	
Attacked					17.29 (0.000)
No	1386	47.2	86.2	13.9	
Yes	1550	52.8	80.4	19.6	
Physical activity					7.72 (0.005)
< 4 times per week	2171	73.9	84.3	15.8	
4+ per week	765	26.1	79.9	20.1	
Truancy					20.45 (0.000)
No	2190	74.6	84.9	15.1	
Yes	746	25.4	77.8	22.3	
Alcohol use					14.93 (0.000)
No	2849	97.0	83.6	16.4	
Yes	87	3.0	67.8	32.2	
Tobacco use					54.34 (0.000)
No	2868	97.7	83.9	16.1	
Yes	68	2.3	50.0	50.0	
Smoking (cigarettes)					26.88 (0.000)
No	2862	97.5	83.7	16.3	
Yes	74	2.5	60.8	39.2	
Number of close friends					18.54 (0.000)
0	252	8.6	73.4	26.6	
1 or 2	1108	37.7	83.8	16.3	
3 or more	1576	53.7	84.2	15.8	
Peer support					3.95 (0.044)
No	862	29.4	81.0	19.0	
Yes	2074	70.6	84.0	16.0	
Parental supervision					5.11 (0.024)
No	876	29.8	80.7	19.3	
Yes	2060	70.2	84.1	15.9	
Parental connectedness					3.28 (0.070)
No	1383	47.1	81.8	18.2	
Yes	1553	52.9	84.3	15.7	
Parental bonding					2.29 (0.130)
No	1283	43.7	81.9	18.0	
Yes	1653	56.3	84.0	16.0	

Source: T-GSHS (2015)

Our study found that hunger, a measure of food insecurity and a proxy measure of socio-economic status, was associated with psychosocial distress among adolescents. Food

insecurity and hunger are public health issues that result in negative health outcomes, including psychosocial distress as also found by Allen et al. (2018) and Tseng et al. (2017).

Table 3 Logistic regression for risk and protective factors of psychosocial distress among adolescents

Variable	Odds ratio	[95% CI]		P value
Age in years				
11–14	Ref			
15+	1.11	0.85	1.47	0.436
Sex				
Male	Ref			
Female	1.02	0.83	1.25	0.874
Grade				
Grade 6–7	Ref			
Form 1	0.81	0.57	1.17	0.267
Form 2	0.55**	0.38	0.80	0.001
Form 3	0.89	0.64	1.23	0.477
Hungry				
No	Ref			
Yes	1.57***	1.25	1.96	0.000
Bullied				
No	Ref			
Yes	1.92***	1.52	2.41	0.000
Fighting				
No	Ref			
Yes	1.06	0.84	1.35	0.607
Attack				
No	Ref			
Yes	1.31**	1.06	1.62	0.012
Physical activity				
>4 days per week	Ref			
4+ days per week	1.33**	1.07	1.66	0.011
Truancy				
No	Ref			
Yes	1.28**	1.02	1.60	0.032
Alcohol use				
No	Ref			
Yes	1.24	0.75	2.02	0.402
Tobacco use				
No	Ref			
Yes	2.40**	1.30	4.46	0.005
Smoking (cigarettes)				
No	Ref			
Yes	1.54	0.87	2.71	0.136
Number of close friends				
0	Ref			
1–2	0.56**	0.40	0.79	0.001
3+	0.57**	0.41	0.79	0.001
Peer support				
No	Ref			
Yes	0.88	0.70	1.10	0.270
Parental supervision				
No	Ref			
Yes	1.00	0.80	1.26	0.964

** $p < 0.01$, *** $p < 0.001$. Ref = reference

Source: T-GSHS (2015)

Additionally, a study by Rani et al. (2018) also found that teenagers from food-insecure households were more likely to have high levels of anxiety, depression, loss of behavioural control and psychological distress than those living in food-secure households. Possible reasons for our finding could be that students who are hungry may experience the stress of food insecurity interfering with their daily lives and the fear of disappointing their families. In addition, the distress could be frustration and anger directed towards the academic

institution for not providing enough resources to support them (Meza et al. 2018).

Bullying and attacks were also found to be risk factors for psychosocial distress. The effect of violence on psychosocial distress in the current study is similar to findings reported elsewhere. For instance, Siziya and Mazaba (2015) in Zambia, DeSmet et al. (2014) in Belgium and Pengpid and Peltzer (2013) in Thailand reported that bullying and being attacked were associated with psychosocial distress among

young people. Participants who suffered attacks and bullying were more likely to have psychosocial distress than participants who were not victimized. The relationship between violence and poor psychological outcomes can be explained by several mechanisms. First, violence victimization is an element of stress, and all types of stress increase the risk of psychological distress at a population level (Margolin and Gordis 2004). This is supported by studies that have shown that hypothalamic-pituitary-adrenal (HPA) axis dysregulation is a mechanism that links violence victimization to psychopathology (Shea et al. 2005). Moreover, stressful events such as abuse have been associated with anxiety disorders such as post-traumatic stress disorder (Kilpatrick et al. 2003). It is therefore important that exposure to bullying and its potential health consequences, such as psychosocial distress, should be well incorporated into school health education programmes (Brown et al. 2008).

Our study found that students who engaged in physical activity had higher odds of experiencing psychosocial distress than those who were not physically active. Siziya and Mazaba (2015) indicated that it is unlikely that being physically active leads to psychosocial distress, which implies that being physically active may actually be a way to deal with stress. In light of this observation made by Siziya and Mazaba (2015) and the results of the current study, it is imperative for further studies to consider a case-control or cohort study to test the associations between physical activity and psychosocial distress.

We also found that chewing tobacco was associated with psychosocial distress. Specifically, those who used tobacco had higher odds of experiencing psychosocial distress than those who did not use tobacco. These observations have also been made in previous studies (Harwood et al. 2007). Turner et al. (2004) explained that psychosocial distress may heighten the risk of substance abuse through mediational links, such as increasing the susceptibility to peer influence and other social influences, including tobacco advertising (Audrain-McGovern et al. 2006). It has been posited that substance use is a social behaviour that is frequently perpetrated in the presence of friends (in many cases their truant peers) and may be used as a way to achieve social belonging (Turner et al. 2004). The relationship between substance abuse and psychosocial distress also calls for further case-control studies, since it has been found that psychosocial distress is a predictor of substance abuse and vice versa. For example, the stress management model explains that people engage in various activities to reduce their distress, and substance use is one such mechanism. Kassel et al. (2003) suggest that there is the possibility of a reverse causality, where the use of substances may actually increase the risk of psychosocial distress (e.g., anxiety). Although our study was not a case-control study and cannot claim causality as explained by Harwood et al. (2007), we propose that substance use and psychosocial distress may demonstrate a more cyclical, as opposed to a

linear or causal, association with one another and suggest that further studies could explore this in more detail. In addition, adolescents who were truants had higher odds of experiencing psychosocial distress than those who were not truants. Our findings confirm the findings of Dembo et al. (2012), who indicated that truant youths often experience psychosocial distress in the form of having problems in school and troubled family situations.

Although age was not directly associated with psychosocial distress, adolescents who were in Form 2 were less likely to experience psychosocial distress than those in grade 6 and 7. The possible explanation for this finding could be that adolescents in Form 2 may not be preparing for any major examinations and as a result might not be anxious about how they will pass their examinations (Muula et al. 2012; Siziya et al. 2007). This finding is contrary to that of Siziya and Mazaba (2015) and Rani et al. (2018), who found that older adolescents were more likely to have psychosocial distress. They gave two principal explanations for their findings. First, they indicated it is possible that younger adolescents may still be regarded as children, and the community may not be as strict with them as with the older adolescents, who are expected to behave like adults. As a result, older adolescents may have difficulties coping with stimuli, such as changing cultural values and conforming to societal roles. Second, they attribute the high level of psychosocial distress among older adolescents to dating disappointments, sexual, physical and emotional abuse. We found that having close friends was protective against psychosocial distress, corroborating what Siziya and Mazaba (2015) found in Zambia, where they indicated that close friends should always be there for each other to share their worries, which will in turn avoid distress.

Despite the relatively large sample size of this study, the two-stage sampling and the national representative nature of the data, it has some inherent limitations. First, the cross-sectional nature of the data does not allow inferences about causal relationships, just associations (Siziya and Mazaba 2015). Also, the study considered only adolescents in school adolescents and as a result may not be generalizable to out-of-school adolescents since the experience of psychosocial distress may be different between in- and out-of-school adolescents (Siziya and Mazaba 2015).

Conclusions and policy implications

The prevalence of psychosocial distress among adolescents in Tanzania is relatively high and appears to be common for both sexes. The risk factors associated with psychosocial distress were hunger, being bullied, being attacked, engaging in physical activity, truancy and tobacco chewing. However, the protective factors were higher grade (Form 2) and having close

friends. To reduce psychosocial distress among in-school adolescents, more attention needs to be paid to the risk factors and to encouraging healthy relationships among adolescents and their close friends.

Acknowledgements We extend our sincere appreciation to all students and teachers for their participation and assistance in the GSHS. We are also grateful to the WHO and its partners for making the data freely available for this study.

Compliance with ethical standards

This is a secondary data analysis. However, informed consent was obtained from all the respondents before the commencement of interviews during the primary data collection.

Consent for publication This manuscript is an original work and has been written by the authors, AS, BOA, LKD, EKA and EB, who all are aware of its content and approve its submission. It is also important to mention that the manuscript has not been published elsewhere in part or in its entirety and is not under consideration by another journal. All authors give their consent for publication in the Journal of Public Health.

Conflict of interest The authors declare that they have no conflict of interest.

References

- Allen NL, Becerra BJ, Becerra MB (2018) Associations between food insecurity and the severity of psychological distress among African-Americans. *Ethn Health* 23(5):511–520
- Audrain-McGovern J, Rodriguez D, Patel V, Faith MS, Rodgers K, Cuevas J (2006) How do psychological factors influence adolescent smoking progression? The evidence for indirect effects through tobacco advertising receptivity. *Pediatrics* 117:1216–1225
- Beattie TS, Prakash R, Mazzuca A, Kelly L, Javalkar P, Raghavendra T, Isac S (2019) Prevalence and correlates of psychological distress among 13–14 year old adolescent girls in North Karnataka, South India: a cross-sectional study. *BMC Public Health* 19(1):48
- Beutel TF, Zwerenz R, Michal M (2018) Psychosocial stress impairs health behavior in patients with mental disorders. *BMC Psychiatry* 18(1):375
- Brown DW, Riley L, Butchart A, Kann L (2008) Bullying among youth from eight African countries and associations with adverse health behaviors. *Pediatr Health* 2:289–299
- Bynner J, Elias P, McNight A, Pan H, Pierre G (2002) Young people's changing routes to independence. Joseph Rowntree Foundation, York
- De Silva MJ, Huttly SR, Harpham T, Kenward MG (2007) Social capital and mental health: a comparative analysis of four low income countries. *Soc Sci Med* 64(1):5–20
- Dembo R, Briones-Robinson R, Ungaro RA, Gullede LM, Karas LM, Winters KC et al (2012) Emotional psychological and related problems among truant youths: an exploratory latent class analysis. *J Emot Behav Disord* 20(3):157–168
- DeSmet A, Deforche B, Hublet A, Tanghe A, Stremersch E, De Bourdeaudhuij I (2014) Traditional and cyberbullying victimization as correlates of psychosocial distress and barriers to a healthy lifestyle among severely obese adolescents—a matched case-control study on prevalence and results from a cross-sectional study. *BMC Public Health* 14(1):224
- Fombonne E (1998) Increased rates of psychosocial disorders in youth. *Eur Arch Psychiatry Clin Neurosci* 248(1):14–21
- Fryers T, Brugha T (2013) Childhood determinants of adult psychiatric disorder. *Clinical practice and epidemiology in mental health: CP & EMH* 9:1
- Global School-Based Student Health Survey (GSHS) Tanzania 2017 GSHS Questionnaire. Retrieved from: www.who.int/ncds/surveillance/gshs/Tanzania_2014_GSHS_Report.pdf
- Harwood GA, Salsberry P, Ferketich AK, Wewers ME (2007) Cigarette smoking, socioeconomic status, and psychosocial factors: examining a conceptual framework. *Public Health Nurs* 24:361–371
- Henderson KM, Clark CJ, Lewis TT, Aggarwal NT, Beck T, Guo H et al (2013) Psychosocial distress and stroke risk in older adults. *Stroke* 44(2):367–372
- Hong Y, Zhang C, Li X, Liu W, Zhou Y (2013) Partner violence and psychosocial distress among female sex workers in China. *PLoS One* 8(4):e62290
- Kassel JD, Stroud LR, Paronis CA (2003) Smoking, stress, and negative affect: correlation, causation and context across stages of smoking. *Psychol Bull* 129:270–304
- Kilpatrick DG, Ruggiero KJ, Acierno R, Saunders BE, Resnick HS, Best CL (2003) Violence and risk of PTSD, major depression, substance abuse/dependence, and comorbidity: results from the National Survey of adolescents. *J Consult Clin Psychol* 71(4):692
- Kleppang AL, Thurston M, Hartz I, Hagquist C (2017) Psychological distress among Norwegian adolescents: changes between 2001 and 2009 and associations with leisure time physical activity and screen-based sedentary behaviour. *Scand J Public Health*. <https://doi.org/10.1177/1403494817716374>
- Lazarus RS, Folkman S (1991) The concept of coping. In: Monat A, Lazarus RS (eds) *Stress and coping: an anthology*, 3rd edn. Columbia University Press, New York, pp 189–206
- Margolin G, Gordis EB (2004) Children's exposure to violence in the family and community. *Curr Dir Psychol Sci* 13(4):152–155
- Meza A, Altman E, Martinez S, Leung CW (2018) “It’s a feeling that one is not worth food”: a qualitative study exploring the psychosocial experience and academic consequences of food insecurity among college students. *J Acad Nutr Diet*:1–9
- Mutumba M, Bauermeister JA, Harper GW, Musiime V, Lepkowski J, Resnicow K, Snow RC (2017) Psychological distress among Ugandan adolescents living with HIV: examining stressors and the buffering role of general and religious coping strategies. *Glob Public Health* 12(12):1479–1491
- Muula AS, Rudatsikira E, Babaniyi O, Songolo P, Siziya S (2012) Prevalence and correlates for school truancy among pupils in grades 7–10: results from the 2004 Zambia global school-based health survey. *BMC Res Notes* 5(1):48
- Page RM, Dennis M, Lindsay GB, Merrill RM (2011) Psychosocial distress and substance use among adolescents in four countries: Philippines, China, Chile, and Namibia. *Youth Soc* 43(3):900–930
- Page RM, Hall CP (2009) Psychosocial Distress and Alcohol Use as Factors in Adolescent Sexual Behavior Among Sub-Saharan African Adolescents. *Journal of School Health*, 79(8):369–379
- Patel V (2013) Reducing the burden of depression in youth: what are the implications of neuroscience and genetics on policies and programs? *J Adolesc Health* 52(2):S36–S38
- Patton GC, Coffey C, Romaniuk H, Mackinnon A, Carlin JB, Degenhardt L et al (2014) The prognosis of common mental disorders in adolescents: a 14-year prospective cohort study. *Lancet* 383(9926):1404–1411
- Peltzer K, Pengpid S (2015) Unintentional injuries and psychosocial correlates among in-school adolescents in Malaysia. *International journal of environmental research and public health*, 12(11):14936–14947
- Pengpid S, Peltzer K (2013) Bullying and its associated factors among school-aged adolescents in Thailand. *Sci World J* 2013:254083

- Qorbani M, Kelishadi R, Taheri E, Motlagh ME, Arzaghi SM, Ardalan G, .. Larijani B (2014) Association between psychosocial distress with cardio metabolic risk factors and liver enzymes in a nationally-representative sample of Iranian children and adolescents: the CASPIAN-III study. *Journal of Diabetes & Metabolic Disorders*, 13(1):44
- Rani D, Singh J, Acharya D, Paudel R, Lee K, Singh S (2018) Household food insecurity and mental health among teenage girls living in urban slums in Varanasi, India: a cross-sectional study. *Int J Environ Res Public Health* 15(8):1585
- Shea A, Walsh C, MacMillan H, Steiner M (2005) Child maltreatment and HPA axis dysregulation: relationship to major depressive disorder and post-traumatic stress disorder in females. *Psychoneuroendocrinology* 30(2):162–178
- Shiferaw S, Fantahun M, Bekele A (2006) Psychosocial problems among students in preparatory school, in Dessie town, north east Ethiopia. *Ethiopian Journal of Health Development*, 20(1):47–55
- Siziya S, Mazaba ML (2015) Prevalence and correlates for psychosocial distress among in-school adolescents in Zambia. *Front Public Health* 3:180
- Siziya S, Muula AS, Rudatsikira E (2007) Prevalence and correlates of truancy among adolescents in Swaziland: findings from the global school-based health survey. *Child Adolesc Psychiatry Ment Health* 1(1):15–18. <https://doi.org/10.1186/1753-2000-1-15>
- Stevenson EG, Greene LE, Maes KC, Ambelu A, Tesfaye YA, Rheingans R, Hadley C (2012) Water insecurity in 3 dimensions: an anthropological perspective on water and women's psychosocial distress in Ethiopia. *Soc Sci Med* 75(2):392–400
- Sweeting H, West P, Young R, Der G (2010) Can we explain increases in young people's psychological distress over time? *Soc Sci Med* 71(10):1819–1830
- Tanzania Mainland 2015 Global School-based Student Health Survey Country Report (2015) Retrieved from www.who.int/ncds/surveillance/gshs/Tanzania_2014_GSHS_Report.pdf
- Tseng KK, Park SH, Shearston JA, Lee L, Weitzman M (2017) Parental psychological distress and family food insecurity: sad dads in hungry homes. *J Dev Behav Pediatr* 38(8):611–618
- Turner L, Mermelstein R, Flay B (2004) Individual and contextual influences on adolescent smoking. *Ann N Y Acad Sci* 1021:175–197
- Wethington E, Glanz K, Schwartz MD (2015) Stress, coping, and health behavior. *Health behavior: theory, research, and practice*, pp 223
- World Health Organization WHO (2011) *The World Health report: mental health and physical activity*: Media centre 2011

Publisher's note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.