CAMBRIDGE
UNIVERSITY PRESS

RESEARCH ARTICLE

Gender differences in social environmental factors of psychological distress among Indonesian adolescents: Findings from the 2015 Global School-based Student Health Survey

I Gusti Ngurah Edi Putra[1,3]* , Putu Erma Pradnyani[2,3] , Gede Wirabuana Putra[2,3],
Ni Luh Eka Purni Astiti[3], Ni Wayan Derayanti[3], Ni Nyoman Astri Artini[3],
Putu Ayu Swandewi Astuti[4], Tashi Dendup[5] and Zubair Ahmed Ratan[6]

[1]Institute of Population Health, University of Liverpool, Liverpool, UK, [2]Health Polytechnic Kartini Bali, Denpasar, Indonesia, [3]Mandala Data, Denpasar, Indonesia, [4]Department of Public Health and Preventive Medicine, Faculty of Medicine, Udayana University, Denpasar, Indonesia, [5]Save the Children, Thimphu, Bhutan and [6]School of Health and Society, Faculty of the Arts, Social Sciences and Humanities, University of Wollongong, Wollongong, Australia
*Correspondence: Email: ediputra.ign@gmail.com

Abstract

Background: This study aimed to investigate gender differences in social environmental factors of psychological distress among Indonesian adolescents.

Methods: This was a cross-sectional study using the data from the 2015 Indonesia Global School-based Student Health Survey. Binary logistic regression was used to assess the influences of main independent variables – social environmental factors (i.e., peer support, having close friends, bullying victimisation, physical fight, physical attack, parental supervision, connectedness, bonding), demographic characteristics, and health-related behaviours on the measures of psychological distress (loneliness, anxiety-induced sleep disturbance, and a combination of both measures as psychological distress).

Results: The prevalence of psychological distress measured as loneliness, anxiety-induced sleep disturbance, and combined psychological distress was 6.12%, 4.52%, and 8.04%, respectively. Findings from multivariate analyses indicated that bullying victimisation, physical attack, experience of hunger (a proxy of socioeconomic status), and sedentary behaviour were associated with all measures of psychological distress. Meanwhile, age, gender, drug use, parental connectedness and bonding, and having no close friends were correlates of one or two measures of psychological distress. Based on gender-stratified analyses, experience of hunger, sedentary behaviour, bullying victimisation, and having no close friends were consistently associated with measures of psychological distress among both girls and boys. In addition, the influence of some social environmental factors, such as parental connectedness, peer support, and physical attack, were more salient among girls.

Conclusions: The findings suggest that social environmental factors, demographic characteristics, and health-related behaviours were associated with psychological distress, and the associations appeared to differ by gender. Interventions that include improving positive social environmental factors (e.g., reducing interpersonal violence, encouraging positive relationships with parents and peers) and promoting healthy behaviours (e.g., less sedentary behaviour, preventing substance use) might help reduce the risk of psychological distress among Indonesian adolescents.

Keywords: mental health; loneliness; anxiety; bullying; parental involvement; substance use; adolescents; students

Introduction

Adolescent mental health problems remain an important global public health issue. The World Health Organization (2020) estimated that 16% of the global burden of disease and injury among young people aged 10-19 years was attributed to mental health problems. Findings from the World Mental Health Surveys among adolescents in 17 countries demonstrated the global prevalence of mental health conditions to range from 10-20% (Kessler, Angermeyer, et al., 2007). In addition, a meta-analysis of 41 studies from 27 countries showed that the worldwide pooled prevalence of mental disorders among children and adolescents was 13.4%, and the prevalence of any anxiety and depressive disorders were 6.5% and 2.6%, respectively (Polanczyk et al., 2015). Mental health conditions, such as depression and anxiety, are documented as leading contributors to illness and disabilities among adolescents aged 15-19 years (World Health Organization, 2020).

Due to changes in physical, social, and cognitive aspects, adolescents are vulnerable to psychological distress, and therefore, early mental health and psychological well-being promotion are important to combat the development of mental health problems (Marsh et al., 2018). American Psychological Association (2020) defines psychological distress as "a set of painful mental and physical symptoms that are associated with normal fluctuations of mood in most people". This term encompasses a range of symptoms or experiences of emotional suffering or deeply unpleasant feelings (e.g., depressive or anxiety symptoms) due to stressors that are hard to cope with in everyday life (Arvidsdotter et al., 2016; McLachlan & Gale, 2018). In some cases, psychological distress can be an indication of the beginning of mental illness (American Psychological Association, 2020). Psychological distress is also shown to be associated with the increased risk of non-communicable diseases (Eriksson et al., 2008; Stansfeld et al., 2002), suicidal behaviours (Putra & Artini, 2022), and mortality (Barry et al., 2019). Kessler Psychological Distress Scale (K6 or K10) (Furukawa et al., 2003) and General Health Questionnaire (GHQ-12) (Goldberg & Blackwell, 1970) that encompass symptoms of anxiety, depression, and other negative mental health states are commonly used to assess psychological distress. Previous studies using school-based data measured adolescent psychological distress using separate items, such as anxiety and loneliness, or a combination of both (Atorkey & Owiredua, 2021; Marthoenis & Schouler-Ocak, 2022; Pengpid & Peltzer, 2020a, 2021). A variety in measures to assess psychological distress among adolescents was also reported (Marsh et al., 2018; Siziya & Mazaba, 2015; Tian et al., 2021).

In Indonesia, the prevalence of depressive symptoms and emotional mental problems among adolescents aged 15-24 years reported in the *Riset Kesehatan Dasar* (Basic Health Research) in 2018 were 6.2% and 10.0%, respectively (Ministry of Health of Indonesia, 2018). Based on the data of the Indonesia Global School-based Student Health Survey (IGSHS) in 2015, the prevalence of psychological distress measured as loneliness and anxiety-induced sleep disturbance among school-going adolescents (12-19 years) was 6.16% and 4.57%, respectively (Ministry of Health of Indonesia, 2015). Marthoenis and Schouler-Ocak (2022) using the 2015 IGSHS reported that the prevalence of psychological distress (i.e., combining measures of loneliness and anxiety-induced sleep disturbance) among Indonesian students was 7.3%. There appears to be a limited number of studies that investigated the factors associated with adolescent psychological distress within the Indonesian context (Dhamayanti et al., 2020; Marthoenis et al., 2018; Marthoenis & Schouler-Ocak, 2022; Mutyahara & Prasetyawati, 2018; Widyasari & Yuniardi, 2019). Therefore, further studies are warranted to fill this evidence gap.

Understanding factors associated with adolescent psychological distress is important since the onset of major mental health conditions usually occurs during adolescence and the detrimental consequences of untreated adolescent mental health problems might persist and extend to adulthood (Kessler, Amminger, et al., 2007; World Health Organization, 2020). Age (Pengpid & Peltzer, 2020a), gender (Siziya & Mazaba, 2015), health-related behaviours, such as substance use (cigarette smoking, alcohol use, or drug use) (Ahinkorah et al., 2021; Pengpid & Peltzer, 2020b) and sedentary behaviour (Vancampfort, Ashdown-Franks, et al., 2019; Vancampfort,

Van Damme, et al., 2019) were found to be associated with psychological distress among adolescents. In addition, according to a conceptual framework proposed by World Health Organization (2005), adolescents' social environments, including parental-, school- or friend-, and community-induced factors can serve as either a risk or protective factor for their mental health. Adolescence is a sensitive period of social interaction, and the influence of social environmental factors is profound on the development of their socio-cognitive skills and mental well-being (Orben et al., 2020). Findings from previous studies demonstrated that negative social interactions such as being bullied (Moore et al., 2017) and interpersonal violence (e.g., being physically attacked and having physical fights) (Pengpid & Peltzer, 2020a, 2021) were associated with increased psychological distress among adolescents. Whereas, better relationships with peers (e.g., social support), having close friends (Marthoenis & Schouler-Ocak, 2022; Pengpid & Peltzer, 2020c; Siziya & Mazaba, 2015), and better parental involvement (e.g., connectedness, bonding) (Tian et al., 2021) were protective against psychological distress. To our knowledge, no studies within the context of Indonesia (including the study by Marthoenis and Schouler-Ocak (2022)) explored the extent to which the influence of these social environmental factors on adolescent psychological factors varies by gender. Earlier studies showed gender differences in the associations between social environmental factors and suicidal behaviours among Indonesian adolescents (Putra et al., 2019). Therefore, understanding gender differences in social environmental factors of psychological distress is important to add to the current knowledge which in turn can potentially inform targeted public health interventions.

Accordingly, this study primarily aimed to identify social environmental factors of psychological distress among Indonesian adolescents using data from the 2015 IGSHS. Given that gender might also modify the influences of different social environmental factors on psychological distress, the potential gender differences in the factors associated with psychological distress were examined in this study.

Methods

Study design and data

This was a cross-sectional study using the most recent data from the Indonesia Global School-based Student Health Survey (IGSHS) in 2015. This national survey was conducted by the Ministry of Health of Indonesia in collaboration with the World Health Organization and the Centers for Disease Control and Prevention aimed to document health risk behaviour among Indonesian school-going adolescents. The sampling for 2015 IGSHS involved two-stage clustered probability sampling. In the first step, a representative sample of schools (75 junior and senior high schools) was selected using the probability proportional to size (PPS) method in provinces mostly covering Java and Sumatra islands and also other provinces in other islands. This step was then followed by the selection of classrooms using systematic sampling in selected schools (Ministry of Health of Indonesia, 2015). Data were collected using an anonymous self-administered questionnaire. Further information about the 2015 IGSHS's methodology, findings, and dataset can be found elsewhere (Centers for Disease Control and Prevention, 2019). In general, GSHS's methodology has been standardised across countries (Fleming & Jacobsen, 2009), and GSHS questionnaire has been tested for validity and reliability (Becker et al., 2010). In this present study, we included all available records of adolescents who participated in the 2015 IGSHS, and only excluded those with missing information on components of psychological distress (i.e., loneliness and anxiety-induced sleep disturbance). Out of 11,142 records of school-going adolescents available in the 2015 IGSHS, 136 records were omitted due to missing values, leaving a total sample of 11,006 adolescents. We decided to not omit missing values on independent variables to avoid further sample loss and to maintain the prevalence of both loneliness and anxiety-induced sleep disturbance in the dataset similar to what was reported in the 2015 GSHS report. This is important to correctly estimate the prevalence of psychological distress developed using both the aforementioned psychological measures.

Variables

The dependent variable was psychological distress and was defined following some previous studies that used the GSHS data (Atorkey & Owiredua, 2021; Marthoenis & Schouler-Ocak, 2022; Pengpid & Peltzer, 2020a, 2021). Psychological distress was determined using two variables from the GSHS, namely loneliness and anxiety-induced sleep disturbance. Responses for both items (feeling lonely and anxious in the last 12 months) were re-coded as "never = 0, rarely/sometimes = 1, most of the time = 2, and always = 3", and then summed up. Those with a total score of three or more were grouped as experiencing psychological distress (Marthoenis & Schouler-Ocak, 2022; Pengpid & Peltzer, 2020a). Findings from exploratory factor analysis indicated that both loneliness and anxiety-induced sleep disturbance had high factor loading (>0.8). However, these components of the psychological distress measure had low reliability (Cronbach's α = 0.57). Due to low reliability, we also analysed loneliness and anxiety-induced sleep disturbance as separate dependent variables in addition to psychological distress. This also expanded the previous work by Marthoenis and Schouler-Ocak (2022) that only explored psychological distress.

Based on the conceptual framework proposed by the World Health Organization (2005) on the importance of social environments among adolescents, we selected the main independent variables depicting social interactions with peers and parents. The selection of social environmental variables was also informed by past works (Pengpid & Peltzer, 2020a, 2021). Social environmental characteristics comprised parental supervision, connectedness, bonding, peer support, having close friends, the experience of bullying, physical fight, and physical attack. Our analysis also included covariates such as demographic characteristics and health-related behaviours. Demographic characteristics included gender, age, and experience of hunger as a proxy for socioeconomic status as was done in previous studies (Dendup et al., 2020; Dendup et al., 2021; Putra & Dendup, 2022). Substance use (smoking, alcohol, drugs) and sedentary behaviour were included under health-related behaviours. The operational definition of the variables used in this study is presented in Table 1. Response options of the variables were dichotomised following previous studies (Atorkey & Owiredua, 2021; Dendup et al., 2020; Dendup et al., 2021; Pengpid & Peltzer, 2020a, 2021; Putra & Dendup, 2022).

Data analyses

Descriptive statistics were used to describe the characteristics of the samples and cross-tabulations were applied to present the prevalence of loneliness, anxiety-induced sleep disturbance, and combined measures of psychological distress by independent variables. Binary logistic regression was employed for bivariate and multivariate analyses to examine unadjusted and adjusted associations between social environmental factors and all psychological distress variables controlling for demographic characteristics and health-related behaviours. Separate multivariate models using the enter method by taking into account all independent variables in the same model were developed for each dependent variable (loneliness, anxiety-induced sleep disturbance, and psychological distress). Analyses were conducted in STATA using the survey command "svy" to adjust for sampling weight and clustering effect of the sampling method employed in the 2015 IGSHS and to provide robust estimates of the associations. Weighted percentages were reported for descriptive analyses. Results were presented as odds ratio (OR) along with their 95% confidence intervals (CI) and p-values.

Results

Table 2 presents the characteristics of the samples and the prevalence of psychological distress by demographic characteristics, social environmental factors, and health-related behaviours. The majority of school-going adolescents were aged ≤ 15 years (82.32%) and an almost equal number of girls and boys were recruited (51.28% vs. 48.47%). Only 4.07% of the adolescents reported that most of the time or always, they went hungry because of not having enough food at home. The majority did not receive adequate parental supervision (63.12%), connectedness (64.53%), and

Table 1. Description of variables used in the study

Variables	Questions from the 2015 IGSHS	Response options	Coding scheme
Dependent variables			
Loneliness	"During the past 12 months, how often have you felt lonely?"	"1 = never to 5 = always"	"1-3 = 0 and 4-5 = 1"
Anxiety-induced sleep disturbance	"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"	"1-3 = 0 and 4-5 = 1"
Psychological distress	Responses from both loneliness and anxiety-induced sleep disturbance were recoded "never = 0, rarely/sometimes = 1, most of the time = 2, and always = 3" and then summed up.		"0-2 = 0 and 3-6 = 1"
Demographic characteristics			
Gender	"What is your sex?"	"1 = male and 2 = female"	"2 = 0 and 1 = 1"
Age	"How old are you?"	"11 years old or younger to 18 years old or older"	"≤15 = 0 and >15 = 1"
Hunger	"During the past 30 days, how often did you go hungry because there was not enough food in your home?"	"1 = never to 5 = always"	"1-3 = 0 and 4-5 = 1"
Social environmental variables			
Parental supervision	"During the past 30 days, how often did your parents or guardians check to see if your homework was done?"	"1 = never to 5 = always"	"1-3 = 0 and 4-5 = 1"
Parental connectedness	"During the past 30 days, how often did your parents or guardians understand your problems and worries?"	"1 = never to 5 = always"	"1-3 = 0 and 4-5 = 1"
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 to 5 = always"	"1-3 = 0 and 4-5 = 1"
Peer support	"During the past 30 days, how often were most of the students in your school kind and helpful?"	"1 = never to 5 = always"	"1-3 = 0 and 4-5 = 1"
Having no close friends	"How many close friends do you have?"	"1 = 0 to 4 = 3 or more"	"1 = 1 and ≥2 = 0"
Bullying	"During the past 30 days, on how many days were you bullied?"	"1 = 0 days to 7 = all 30 days"	"1 = 0 and ≥2 = 1"
Physical fight	"During the past 12 months, how many times were you in a physical fight?"	"1 = 0 times to 8 = 12 or more times"	"1 = 0 and ≥2 = 1"
Physical attack	"During the past 12 months, how many times were you physically attacked?"	"1 = 0 times to 8 = 12 or more times"	"1 = 0 and ≥2 = 1"

(*Continued*)

Table 1. (*Continued*)

Variables	Questions from the 2015 IGSHS	Response options	Coding scheme
Health-related behaviours			
Smoking cigarettes	"During the past 30 days, on how many days did you smoke cigarettes?"	"1 = 0 days to 7 = all 30 days"	"1 = 0 and ≥2 = 1"
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"	"1 = 0 and ≥2 = 1"
Drug use	"How old were you when you first used drugs?"	"1 = I have never used drugs to 8 = 18 years old or older"	"1 = 0 and ≥2 = 1"
Sedentary behaviour	"How much time do you spend during a typical or usual day sitting and watching television, playing computer games, talking with friends, or doing other sitting activities, such as using the computer or cell phone?"	"1 = Less than 1 hour per day … 3 = 3 to 4 hours per day … 6 = 8 or more hours a day"	"1-2 = 0 and ≥3 = 1"

bonding (59.30%). Similarly, more than half of the adolescents (60.01%) reported not receiving peer support. Nearly 3% of them reported not having close friends at all and less than 20% were bullied at least one day in the last month. While 22.93% of the adolescents have involved in a physical fight, and 32.32% were physically attacked. In addition, the proportions of adolescents who had ever smoked, drank alcohol (in the last 30 days), and used drugs (in a lifetime) were 11.18%, 4.12%, and 2.41%, respectively. More than one-fourth of the adolescents spent at least three hours doing sitting activities per day (26.78%).

The prevalence of loneliness, anxiety-induced sleep disturbance, and psychological distress among Indonesian school-going adolescents was 6.12%, 4.52%, and 8.04%, respectively. While the prevalence of self-reported loneliness and psychological distress was higher among girls, the prevalence of anxiety-induced sleep disturbance was slightly higher among boys. The prevalence of loneliness, anxiety-induced sleep disturbance, and psychological distress was consistently higher among adolescents who were older (> 15 years), experienced hunger, without adequate parental supervision, connectedness, and bonding, did not have close friends, were bullied, involved in a physical fight, and were physically attacked. The prevalence of all measures of distress was also higher among those who used substances (cigarette smoking, alcohol, drugs) and were sedentary.

Table 3 presents bivariate analyses of social environmental factors associated with all measures of psychological distress. While receiving parental supervision, connectedness, and peer support was associated with a lower likelihood of loneliness and psychological distress, parental bonding appeared to be a protective factor for anxiety-induced sleep disturbance. Other factors such as having no close friends, being bullied, being involved in a physical fight, and being physically attacked, were consistently associated with an increased likelihood of all measures of psychological distress. In addition, using any substances and sedentary behaviour was associated with increased psychological distress. For demographic characteristics, being older was associated with a higher likelihood of anxiety and psychological distress. Meanwhile, gender was only associated with loneliness, of which boys were less likely to feel lonely than girls. Being hungry was associated with an increased likelihood of experiencing all psychological distress variables.

Adjusted associations between independent variables and all measures of psychological distress are presented in Table 4. Multicollinearity tests using correlation analyses showed that the independent variables were not highly correlated (r < 0.5). Parental connectedness emerged to be a

Table 2. Characteristics of the samples and the prevalence of psychological distress by independent variables

Variables	n = 11,006 (%*)	Prevalence of loneliness n (%*)	Prevalence of anxiety-induced sleep disturbance n (%*)	Prevalence of psychological distress n (%*)
Dependent variable				
Loneliness				
No	10,322 (93.88)			
Yes	684 (6.12)			
Anxiety-induced sleep disturbance				
No	10,503 (95.48)			
Yes	503 (4.52)			
Psychological distress				
No	10,105 (91.96)			
Yes	901 (8.04)			
Demographic characteristics				
Age group				
≤ 15 years	8,938 (82.32)	534 (5.92)	385 (4.25)	691 (7.63)
> 15 years	2,053 (17.65)	150 (7.10)	117 (5.79)	210 (9.99)
Missing or not reported	*15 (0.12)*			
Gender				
Female	5,979 (51.28)	418 (6.78)	258 (4.18)	537 (8.65)
Male	4,999 (48.47)	264 (5.41)	243 (4.86)	362 (7.37)
Missing or not reported	*28 (0.25)*			
Experience of hunger				
No	10,493 (95.53)	601 (5.67)	442 (4.21)	797 (7.55)
Yes	470 (4.07)	81 (16.82)	60 (11.90)	103 (19.94)
Missing or not reported	*43 (0.39)*			
Social environmental variables				
Parental supervision				
No	7,042 (63.12)	464 (6.59)	324 (4.51)	611 (8.52)
Yes	3,771 (35.28)	206 (5.22)	167 (4.40)	270 (7.00)
Missing or not reported	*193 (1.60)*			
Parental connectedness				
No	7,088 (64.53)	480 (6.73)	329 (4.59)	625 (8.67)
Yes	3,768 (34.25)	199 (5.05)	165 (4.38)	265 (6.89)
Missing or not reported	*150 (1.22)*			

(*Continued*)

Table 2. (*Continued*)

Variables	n = 11,006 (%*)	Prevalence of loneliness n (%*)	Prevalence of anxiety-induced sleep disturbance n (%*)	Prevalence of psychological distress n (%*)
Parental bonding				
No	6,533 (59.30)	424 (6.37)	326 (5.04)	564 (8.53)
Yes	4,283 (39.22)	255 (5.85)	169 (3.77)	328 (7.41)
Missing or not reported	*190 (1.48)*			
Peer support				
No	6,611 (60.01)	450 (6.74)	297 (4.49)	578 (8.72)
Yes	4,248 (38.80)	226 (5.18)	200 (4.60)	313 (7.02)
Missing or not reported	*147 (1.18)*			
Having no close friends				
No	10,634 (96.52)	628 (5.81)	466 (4.35)	837 (7.72)
Yes	313 (2.98)	51 (16.01)	26 (8.24)	53 (16.92)
Missing or not reported	*59 (0.50)*			
Bullying				
No	8,154 (74.15)	366 (4.40)	261 (3.14)	482 (5.74)
Yes	2,092 (19.07)	258 (12.39)	194 (9.34)	336 (16.28)
Missing or not reported	*760 (6.78)*			
Physical fight				
No	8,357 (76.30)	462 (5.45)	314 (3.72)	593 (6.94)
Yes	2,561 (22.95)	215 (8.25)	183 (7.15)	298 (11.61)
Missing or not reported	*88 (0.75)*			
Physical attack				
No	7,432 (67.19)	374 (4.96)	260 (3.39)	488 (6.41)
Yes	3,514 (32.32)	305 (8.47)	239 (6.82)	405 (11.32)
Missing or not reported	*60 (0.48)*			
Health-related behaviours				
Smoking status				
No	9,740 (87.68)	564 (5.70)	406 (4.08)	745 (7.44)
Yes	1,133 (11.18)	104 (8.85)	86 (7.52)	139 (12.30)
Missing or not reported	*133 (1.14)*			
Alcohol consumption				
No	10,361 (94.18)	608 (5.79)	439 (4.15)	804 (7.58)
Yes	443 (4.12)	50 (10.63)	43 (9.93)	65 (14.58)
Missing or not reported	*202 (1.71)*			

(*Continued*)

Table 2. (*Continued*)

Variables	n = 11,006 (%*)	Prevalence of loneliness n (%*)	Prevalence of anxiety-induced sleep disturbance n (%*)	Prevalence of psychological distress n (%*)
Drug use				
No	10,413 (94.64)	618 (5.77)	432 (4.08)	805 (7.51)
Yes	244 (2.41)	30 (13.15)	43 (18.45)	48 (21.10)
Missing or not reported	*349 (2.95)*			
Sedentary behaviour				
No	7,944 (71.64)	436 (5.40)	300 (3.76)	555 (6.90)
Yes	2,866 (26.78)	239 (8.14)	193 (6.57)	330 (11.11)
Missing or not reported	*196 (1.59)*			

*weighted percentage

protective factor for loneliness and psychological stress, and parental bonding was protective against anxiety. Moreover, having no close friends was associated with an increased likelihood of feeling lonely and experiencing psychological distress. Being bullied and physically attacked was associated with experiencing all measures of psychological distress. Age was associated with anxiety and psychological distress, and gender was associated with loneliness and psychological distress. Those who reported being hungry and sedentary were more likely to experience all measures of psychological distress. Adolescents who used drugs were also about 2 times more likely to feel anxious than those who did not.

Figure 1 shows the differences in correlates of all measures of psychological distress by gender. Experiencing hunger and being bullied was associated with all psychological distress variables for both girls and boys. For both genders, having no close friends was associated with loneliness and psychological distress. Those girls and boys who were sedentary were more likely to experience anxiety-induced sleep disturbance and psychological distress. A statistically significant association between sedentary and loneliness was observed among girls only. In addition, social environmental factors such as parental connectedness emerged to be a protective factor for loneliness and overall psychological distress among female samples only. Similarly, receiving peer support was associated with a decreased likelihood of loneliness among females. Furthermore, statistically significant associations between physical attack and all psychological distress variables were found among girls.

Discussion

Overall, findings from this study suggest that the prevalence of psychological distress among Indonesian school-going adolescents was 8.04%, which is much lower than the prevalence reported in other studies in developing nations that used the same definition of psychological distress, such as Morocco (23.3%) (Pengpid & Peltzer, 2020a) and Liberia (24.5%) (Pengpid & Peltzer, 2021). The prevalence of psychological distress in our study was slightly higher compared to the study by Marthoenis and Schouler-Ocak (2022) conducted using the same data (8.0% vs. 7.3%). The study by Marthoenis and Schouler-Ocak (2022) removed all observations with missing

Table 3. Bivariate analyses of factors associated with psychological distress

Variables	Loneliness		Anxiety-induced sleep disturbance		Psychological distress	
	OR (95%CI)	p-value	OR (95%CI)	p-value	OR (95%CI)	p-value
Demographic characteristics						
Age group *(ref: ≤ 15 years)*						
> 15 years	1.22 (0.96 – 1.55)	0.109	1.39 (1.09 – 1.75)	0.008	1.34 (1.08 – 1.67)	0.009
Gender *(ref: Female)*						
Male	0.79 (0.66 – 0.93)	0.007	1.17 (0.93 – 1.46)	0.166	0.84 (0.70 – 1.01)	0.057
Experience of hunger *(ref: No)*						
Yes	3.36 (2.53 – 4.47)	<0.001	3.07 (2.37 – 3.98)	<0.001	3.05 (2.41 – 3.86)	<0.001
Social environmental variables						
Parental supervision *(ref: No)*						
Yes	0.78 (0.64 – 0.96)	0.018	0.97 (0.78 – 1.21)	0.804	0.81 (0.69 – 0.94)	0.007
Parental connectedness *(ref: No)*						
Yes	0.74 (0.61 – 0.89)	0.003	0.95 (0.75 – 1.21)	0.685	0.78 (0.67 – 0.91)	0.002
Parental bonding *(ref: No)*						
Yes	0.91 (0.75 – 1.12)	0.373	0.74 (0.59 – 0.93)	0.012	0.86 (0.71 – 1.03)	0.101
Peer support *(ref: No)*						
Yes	0.76 (0.59 – 0.97)	0.030	1.03 (0.81 – 1.30)	0.830	0.79 (0.64 – 0.98)	0.032
Having no close friends *(ref: No)*						
Yes	3.09 (2.10 – 4.55)	<0.001	1.98 (1.13 – 3.46)	0.019	2.43 (1.64 – 3.62)	<0.001
Bullying *(ref: No)*						
Yes	3.07 (2.47 – 3.82)	<0.001	3.17 (2.68 – 3.76)	<0.001	3.19 (2.74 – 3.72)	<0.001
Physical fight *(ref: No)*						
Yes	1.56 (1.28 – 1.90)	<0.001	1.99 (1.65 – 2.41)	<0.001	1.76 (1.47 – 2.10)	<0.001
Physical attack *(ref: No)*						
Yes	1.77 (1.54 – 2.04)	<0.001	2.08 (1.73 –2.50)	<0.001	1.86 (1.66 –2.09)	<0.001
Health-related behaviours						
Smoking status *(ref: No)*						
Yes	1.61 (1.21 – 2.14)	0.002	1.91 (1.47 – 2.49)	<0.001	1.74 (1.44 – 2.12)	<0.001
Alcohol consumption *(ref: No)*						
Yes	1.94 (1.42 – 2.65)	<0.001	2.55 (1.79 – 3.61)	<0.001	2.08 (1.67 – 2.58)	<0.001
Drug use *(ref: No)*						
Yes	2.47 (1.72 – 3.55)	<0.001	5.33 (3.19 –8.89)	<0.001	3.29 (2.22 – 4.89)	<0.001
Sedentary behaviour *(ref: No)*						
Yes	1.55 (1.33 – 1.82)	<0.001	1.80 (1.40 – 2.32)	<0.001	1.69 (1.40 – 2.03)	<0.001

ref = reference group; OR = odds ratio; CI = confidence interval

Table 4. Multivariate analyses of factors associated with psychological distress

Variables	Loneliness (n = 9,364)		Anxiety-induced sleep disturbance (n = 9,364)		Psychological distress (n = 9,364)	
	AOR (95%CI)	p-value	AOR (95%CI)	p-value	AOR (95%CI)	p-value
Demographic characteristics						
Age group *(ref: ≤ 15 years)*						
> 15 years	1.09 (0.85 – 1.40)	0.498	1.43 (1.14 – 1.80)	0.003	1.28 (1.03 – 1.59)	0.029
Gender *(ref: Female)*						
Male	0.55 (0.44 – 0.69)	<0.001	0.87 (0.64 – 1.20)	0.389	0.60 (0.48 – 0.74)	<0.001
Experience of hunger *(ref: No)*						
Yes	3.06 (2.19 – 4.28)	<0.001	2.74 (1.92 – 3.91)	<0.001	2.68 (1.91 – 3.76)	<0.001
Social environmental variables						
Parental supervision *(ref: No)*						
Yes	0.88 (0.71 – 1.09)	0.248	1.12 (0.87 – 1.43)	0.384	0.96 (0.81 – 1.14)	0.663
Parental connectedness *(ref: No)*Yes	0.79 (0.63 – 0.99)	0.039	1.06 (0.81 – 1.38)	0.684	0.82 (0.68 – 0.98)	0.034
Parental bonding *(ref: No)*						
Yes	1.08 (0.85 – 1.36)	0.536	0.72 (0.55 – 0.95)	0.023	0.96 (0.75 – 1.23)	0.770
Peer support *(ref: No)*						
Yes	0.87 (0.66 – 1.14)	0.301	1.15 (0.90 – 1.47)	0.244	0.91 (0.71 – 1.17)	0.458
Having no close friends *(ref: No)*						
Yes	3.32 (2.08 – 5.31)	<0.001	1.26 (0.65 – 2.47)	0.487	2.34 (1.47 – 3.71)	0.001
Bullying *(ref: No)*						
Yes	2.68 (2.11 – 3.39)	<0.001	2.47 (2.04 – 2.99)	<0.001	2.68 (2.27 – 3.17)	<0.001
Physical fight *(ref: No)*						
Yes	0.93 (0.69 – 1.27)	0.654	1.03 (0.75 – 1.42)	0.840	1.07 (0.83 – 1.39)	0.578
Physical attack *(ref: No)*						
Yes	1.30 (1.06 – 1.59)	0.012	1.45 (1.16 – 1.80)	0.002	1.40 (1.18 – 1.65)	<0.001
Health-related behaviours						
Smoking status *(ref: No)*						
Yes	1.41 (0.91 – 2.19)	0.123	1.06 (0.72 – 1.56)	0.779	1.32 (0.93 – 1.87)	0.114
Alcohol consumption *(ref: No)*						
Yes	1.25 (0.74 – 2.12)	0.392	1.34 (0.91 – 1.97)	0.129	1.27 (0.90 – 1.79)	0.168
Drug use *(ref: No)*						
Yes	1.31 (0.65 – 2.62)	0.443	2.12 (1.22 – 3.66)	0.008	1.55 (0.86 – 2.81)	0.141
Sedentary behaviour *(ref: No)*						
Yes	1.51 (1.23 – 1.87)	<0.001	1.83 (1.39 – 2.40)	<0.001	1.66 (1.35 – 2.04)	<0.001

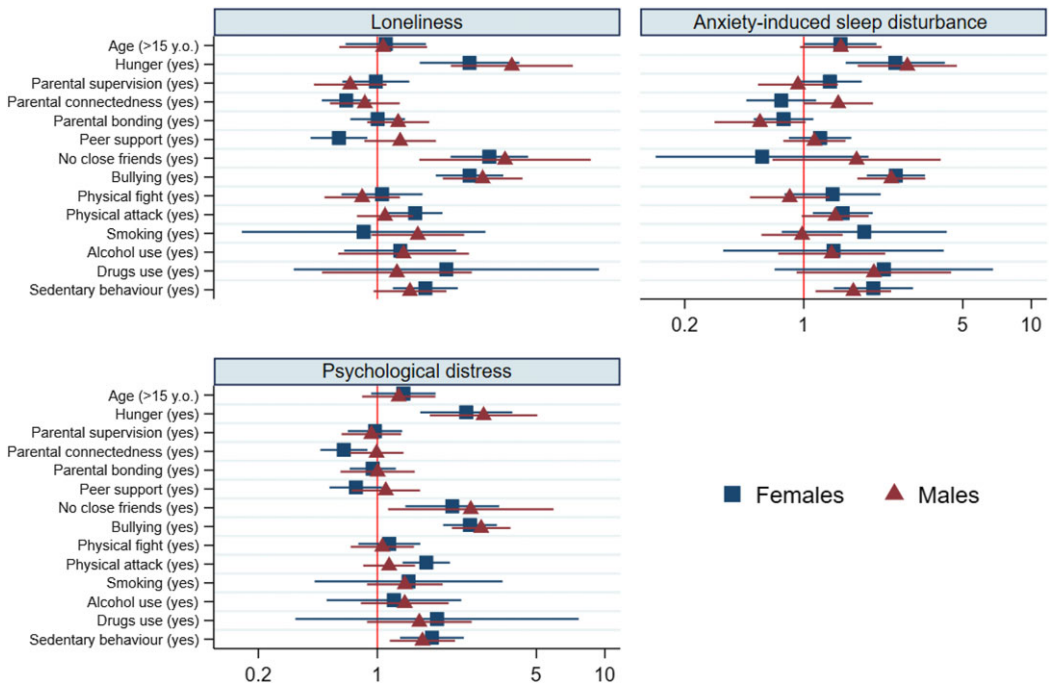*ref = reference group; AOR = adjusted odds ratio; CI = confidence interval*

Figure 1. Gender-disaggregated multivariate analyses of factors associated with psychological distress.

values on independent variables, resulting in a reduction in sample size (n = 8,698 vs. 11,006 in our study). In addition, we took into account sample weights to correctly estimate the prevalence, following the 2015 IGSHS report (Ministry of Health of Indonesia, 2015).

The heterogeneity of socio-cultural contexts of study settings might explain the diverse findings on the prevalence of adolescent psychological distress in this study compared to studies from other countries. For example, components of psychological distress derived from self-reports among adolescents might be influenced by social desirability bias due to cultural and religious values of mental health. The stigma related to mental health issues in Indonesian society might lead to underreporting of mental health problems and put the sufferers at a disadvantage (Hartini et al., 2018; Putra et al., 2019). Moreover, the prevalence of contributing factors of psychological distress, such as the experience of hunger (used as a proxy for socioeconomic measures) was higher in Morocco (9.20%) (Pengpid & Peltzer, 2020a) and Liberia (16.60%) (Pengpid & Peltzer, 2021) compared to 4.07% in our study that might also contribute to differences in the prevalence of psychological factors. However, further investigation is needed to explore differences in the prevalence of psychological distress across countries, such as possible clinical explanations. Although the prevalence is seemingly low among Indonesian adolescents, psychological distress during adolescence might have long-term impacts and manifest in adulthood (Goosby et al., 2013). Therefore, understanding psychological distress and the associated factors among younger population is important in designing public health policies and programs in a targeted manner.

This present study found that some factors were consistently associated with all measures of psychological distress, such as the experience of hunger, bullying victimisation, being physically attacked, and sedentary behaviour. Other factors that included age, gender, parental connectedness and bonding, having no close friends, and drug use were associated with one or two measures of psychological distress. In addition, the influences of some social environmental variables

(i.e., physical attack, parental connectedness, peer support) were more pronounced among female samples only.

The prevalence of loneliness and psychological distress was found to be lower among males, indicating that males were less likely to experience loneliness and psychological distress than females. Similarly, findings from previous studies from different settings suggest that being female was associated with increased odds of having psychological distress (Pengpid & Peltzer, 2020a, 2021). In general, internalising problems (e.g., psychological distress, depression) were more likely to be reported by females than males (Marsh et al., 2018; Rescorla et al., 2007). Besides, females are vulnerable to stress due to biological predispositions, such as experiencing hormonal fluctuations (e.g., menstruation), as well as, social factors (e.g., social expectations from gender roles) that can provoke psychological distress (Hantsoo & Epperson, 2017; Mayor, 2015; Parker & Brotchie, 2010). Furthermore, older adolescents were more likely to experience anxiety-induced sleep disturbance and psychological distress. This might be due to socio-cognitive development that allows for considering uncertain future and social expectations, and changes in physical and psychosocial aspects (Byrne et al., 2007; Pengpid & Peltzer, 2020a).

Previous work showed that hunger and food insecurity was associated with psychological distress (Allen et al., 2018; Rani et al., 2018; Tseng et al., 2017). Low intake of calorie due to inadequate food consumption might be associated with emotional reactivity, which in turn, lead to mental health problems (Peltzer & Pengpid, 2017a). Concerning the experience of hunger as a proxy of low socioeconomic status, children from low socioeconomic families are more likely to have fewer social skills that potentially inhibit the development of social interactions and contribute to loneliness, anxiety, and psychological distress (Peltzer & Pengpid, 2017b). Another possible explanation that people from the low-income group are vulnerable to psychological distress could be due to unfavourable living situations such as less-safe neighbourhoods and low local amenities that can deter positive social contact with and receiving support from others (Kearns et al., 2015).

Adverse impacts of negative social environments, such as bullying victimisation on psychological distress have been documented (Moore et al., 2017; Pengpid & Peltzer, 2019; Putra & Dendup, 2022). Negative peer interactions, such as being bullied or interpersonal violence and rejection by peers can be stressful life events and sources of psychosocial stressors among adolescents that can contribute to the development of psychological distress (Ferguson & Zimmer-Gembeck, 2014; Platt et al., 2013). Those with these psychosocial stressors also tend to have low self-esteem and negatively interpret their social environment and are more anxious about peer interactions (Swearer & Hymel, 2015; Tsaousis, 2016). Other unpleasant peer-related situations such as having no close friends and being physically attacked were also found as determinants of psychological distress and suicidal behaviours (Pengpid & Peltzer, 2020a, 2021; Putra et al., 2019; Sauter et al., 2020). Stronger associations between the experience of being physically attacked and psychological distress among girls in this present study might be due to gender-typical behaviours. Girls were less likely to cope with physical aggression by themselves, whereas boys tend to fight back the peer aggressor as a coping strategy (Cava et al., 2021).

Parental connectedness was protective against loneliness and psychological distress, and similarly, parental bonding was protective against anxiety-induced sleep disturbance. Results from gender-disaggregated analyses suggest stronger influences of parental connectedness on loneliness and psychological distress, and of peer support on loneliness, among girls only. In many societies, females tend to have strong social relationships due to greater intimacy than males. They also have more self-disclosure and are active in seeking social support. By contrast, males tend to be less involved in intimate discussions with friends and reluctant in seeking social support when facing problems (Jobe-Shields et al., 2011; McKenzie et al., 2018). The influence of gender norms in most Asian countries, including Indonesia might also play important roles. Males are expected to be strong emotionally, and hence, they might not easily disclose their problems to others (Ibrahim et al., 2017). This is also supported by findings in a previous study suggesting that men were less

able to open up to friends and family than females (Henning-Smith et al., 2018; McKenzie et al., 2018). This socio-cultural context might help explain the non-statistically significant influences of parental connectedness and peer support on psychological distress among boys.

From health-related behaviours, sedentary behaviour appeared as a consistent predictor for all dependent variables, irrespective of gender. Findings from a systematic review suggest consistent evidence of the association between sedentary behaviour, particularly leisure screen time with a range of mental health outcomes (Hoare et al., 2016). Previous analyses using GSHS data from multiple countries also found that sedentariness was associated with depressive symptoms, loneliness, and anxiety-induced sleep disturbance (Vancampfort, Ashdown-Franks, et al., 2019; Vancampfort et al., 2018; Vancampfort, Van Damme, et al., 2019). Adolescents who are sedentary cut back on time spent on physical activity that potentially reduces the positive effects of being physically active on social, general, pathophysiological, and mental health aspects (Hoare et al., 2016; Huang et al., 2020; Pengpid & Peltzer, 2020a). The association between being sedentary and psychological distress may also be explained by the inflammatory process (Vancampfort, Van Damme, et al., 2019). The result also showed that drug use was associated with anxiety-induced sleep disturbance, which is congruent with findings from past studies (Ahinkorah et al., 2021; Pengpid & Peltzer, 2020b). The use of drugs as a coping attempt for stress among adolescents might be dysfunctional and maladaptive that can trigger anxiety disorders (Ahinkorah et al., 2021; Buckner et al., 2007). Other substance-use variables (i.e., cigarette smoking and alcohol use) did not appear to be strong predictors of psychological distress when the influences of other variables were taken into account.

Strengths and limitations

The use of national survey data from 2015 IGSHS makes the findings applicable in Indonesia. Given the paucity of published studies on adolescents' psychological distress in Indonesia, the findings from this study can potentially contribute to the knowledge base and help inform targeted interventions to reduce mental health problems. In addition, findings from gender-disaggregated analyses on factors associated with psychological distress serve as a new addition to the literature. The limitations include the cross-sectional design that cannot deduce the temporal relationship. The information on self-reported loneliness and anxiety-induced sleep disturbance might be underreported due to the influence of social desirability. The use of the anonymous self-reported questionnaire nonetheless might help minimise this bias to some extent. Moreover, self-reported measures might be subjected to recall bias. Furthermore, this present study is based on data that were collected in 2015. There have been changes since then. For instance, the COVID-19 pandemic might have led to an increase in mental health problems including psychological distress and interrupted social connection among adolescents. Future studies are needed to better understand this problem in the current and future times.

Conclusions

Based on the data of the 2015 IGSHS, around 8% of Indonesian school-going adolescents experienced psychological distress in the last 12 months. Negative social environments such as bullying victimisation and being physically attacked in addition to the experience of hunger and sedentariness were associated with all measures of psychological distress (loneliness, anxiety-induced sleep disturbance, and combined psychological distress). Older students, females, those who did not receive adequate parental connectedness and bonding, did not have any close friends, and used drugs had an increased likelihood of experiencing one or two measures of psychological distress. The findings also suggest potential gender differences in the social environmental factors associated with psychological distress. Policy interventions in public health programs intended to reduce bullying and interpersonal violence, encourage and foster healthy relationships with peers and

parents, promote healthy lifestyles by increasing physical activity, and prevent substance use might help reduce the risk of psychological distress and associated negative health and social impacts. Interventions focused on older students, females, and those from low socioeconomic backgrounds might result in larger gains.

Conflict of interest. The authors have no conflicts of interest to declare.

Ethical approval. The 2015 IGSHS has been approved by the Ethics Commission of the Ministry of Health of Indonesia.

References

Ahinkorah, B. O., Aboagye, R. G., Arthur-Holmes, F., Hagan, J. E., Okyere, J., Budu, E., Dowou, R. K., Adu, C., & Seidu, A.-A. (2021). A Multi-Country Analysis of Prevalence of Anxiety-Induced Sleep Disturbance and Its Associated Factors among In-School Adolescents in Sub-Saharan Africa Using the Global School-Based Health Survey. 9(2), 234. https://www.mdpi.com/2227-9032/9/2/234

Allen, N. L., Becerra, B. J., & Becerra, M. B. (2018, 2018/07/04). Associations between food insecurity and the severity of psychological distress among African-Americans. *Ethn Health*, **23**(5), 511–520. https://doi.org/10.1080/13557858.2017.1280139

American Psychological Association. (2020). APA dictionary of psychology: psychological distress. Retrieved 14 May from https://dictionary.apa.org/psychological-distress

Arvidsdotter, T., Marklund, B., Kylén, S., Taft, C., & Ekman, I. (2016, 2016/12/01). Understanding persons with psychological distress in primary health care. *Scandinavian Journal of Caring Sciences*, **30**(4), 687–694. https://doi.org/10.1111/scs.12289

Atorkey, P., & Owiredua, C. (2021, 2021/03/01/). Clustering of multiple health risk behaviours and association with socio-demographic characteristics and psychological distress among adolescents in Ghana: A latent class analysis. *SSM - Population Health*, **13**, 100707. https://doi.org/10.1016/j.ssmph.2020.100707

Barry, V., Stout, M. E., Lynch, M. E., Mattis, S., Tran, D. Q., Antun, A., Ribeiro, M. J. A., Stein, S. F., & Kempton, C. L. (2019, 2020/02/01). The effect of psychological distress on health outcomes: A systematic review and meta-analysis of prospective studies. *Journal of Health Psychology*, **25**(2), 227–239. https://doi.org/10.1177/1359105319842931

Becker, A. E., Roberts, A. L., Perloe, A., Bainivualiku, A., Richards, L. K., Gilman, S. E., & Striegel-Moore, R. H. (2010, 2010/04/01). Youth health-risk behavior assessment in Fiji: the reliability of Global School-based Student Health Survey content adapted for ethnic Fijian girls. *Ethn Health*, **15**(2), 181–197. https://doi.org/10.1080/13557851003615552

Buckner, J. D., Bonn-Miller, M. O., Zvolensky, M. J., & Schmidt, N. B. (2007, 2007/10/01/). Marijuana use motives and social anxiety among marijuana-using young adults. *Addict Behav*, **32**(10), 2238–2252. https://doi.org/10.1016/j.addbeh.2007.04.004

Byrne, D. G., Davenport, S. C., & Mazanov, J. (2007, 2007/06/01/). Profiles of adolescent stress: The development of the adolescent stress questionnaire (ASQ). *Journal of Adolescence*, **30**(3), 393–416. https://doi.org/10.1016/j.adolescence.2006.04.004

Cava, M.-J., Ayllón, E., & Tomás, I. (2021). Coping Strategies against Peer Victimization: Differences According to Gender, Grade, Victimization Status and Perceived Classroom Social Climate. 13(5), 2605. https://www.mdpi.com/2071-1050/13/5/2605

Centers for Disease Control and Prevention. (2019). Global School-based Student Health Survey (GSHS): Indonesia. https://www.cdc.gov/gshs/countries/seasian/indonesia.htm

Dendup, T., Putra, I. G. N. E., Dorji, T., Tobgay, T., Dorji, G., Phuntsho, S., & Tshering, P. (2020, 2020/12/01/). Correlates of sedentary behaviour among Bhutanese adolescents: Findings from the 2016 Global School-based health survey. *Children and Youth Services Review*, **119**, 105520. https://doi.org/10.1016/j.childyouth.2020.105520

Dendup, T., Putra, I. G. N. E., Tobgay, T., Dorji, G., Phuntsho, S., Wangdi, S., Yangchen, P., & Wangdi, K. (2021). Prevalence and risk factors of overweight among adolescents: an analysis of Bhutan Global School-based Student Health Survey data. *Vulnerable Children and Youth Studies*, 1–14. https://doi.org/10.1080/17450128.2021.1903125

Dhamayanti, M., Noviandhari, A., Masdiani, N., Pandia, V., & Sekarwana, N. (2020, 2020/06/27). The association of depression with child abuse among Indonesian adolescents. *BMC Pediatr*, **20**(1), 313. https://doi.org/10.1186/s12887-020-02218-2

Eriksson, A. K., Ekbom, A., Granath, F., Hilding, A., Efendic, S., & Östenson, C. G. (2008, 2008/07/01). Psychological distress and risk of pre-diabetes and Type 2 diabetes in a prospective study of Swedish middle-aged men and women [https://doi.org/10.1111/j.1464-5491.2008.02463.x]. *Diabetic Medicine*, 25(7), 834-842. https://doi.org/10.1111/j.1464-5491.2008.02463.x

Ferguson, S., & Zimmer-Gembeck, M. J. (2014). Associations of Parental and Peer Rejection With Preadolescents' Loneliness: Emotional Sensitivities as Mediators. *Journal of Relationships Research*, 5, e9, Article e9. https://doi.org/10.1017/jrr.2014.9

Fleming, L. C., & Jacobsen, K. H. (2009). Bullying among middle-school students in low and middle income countries. *Health Promotion International*, 25(1), 73–84. https://doi.org/10.1093/heapro/dap046 %J Health Promotion International

Furukawa, T. A., Kessler, R. C., Slade, T., & Andrews, G. (2003). The performance of the K6 and K10 screening scales for psychological distress in the Australian National Survey of Mental Health and Well-Being. *Psychol Med*, 33(2), 357–362. https://doi.org/10.1017/S0033291702006700

Goldberg, D. P., & Blackwell, B. (1970). Psychiatric illness in general practice. A detailed study using a new method of case identification. *British medical journal*, 1(5707), 439–443. https://doi.org/10.1136/bmj.2.5707.439

Goosby, B. J., Bellatorre, A., Walsemann, K. M., & Cheadle, J. E. (2013). Adolescent Loneliness and Health in Early Adulthood. *Sociological inquiry*, 83(4), 10.1111/soin.12018. https://doi.org/10.1111/soin.12018

Hantsoo, L., & Epperson, C. N. (2017). Anxiety Disorders Among Women: A Female Lifespan Approach. 15(2), 162-172. https://doi.org/10.1176/appi.focus.20160042

Hartini, N., Fardana, N. A., Ariana, A. D., & Wardana, N. D. (2018). Stigma toward people with mental health problems in Indonesia. *Psychology research and behavior management*, 11, 535–541. https://doi.org/10.2147/PRBM.S175251

Henning-Smith, C., Ecklund, A., Moscovice, I., & Kozhimannil, K. (2018). Gender Differences in Social Isolation and Social Support among Rural Residents.

Hoare, E., Milton, K., Foster, C., & Allender, S. (2016, 2016/10/08). The associations between sedentary behaviour and mental health among adolescents: a systematic review. *International Journal of Behavioral Nutrition and Physical Activity*, 13(1), 108. https://doi.org/10.1186/s12966-016-0432-4

Huang, Y., Li, L., Gan, Y., Wang, C., Jiang, H., Cao, S., & Lu, Z. (2020, 2020/01/22). Sedentary behaviors and risk of depression: a meta-analysis of prospective studies. *Translational Psychiatry*, 10(1), 26. https://doi.org/10.1038/s41398-020-0715-z

Ibrahim, N., Amit, N., Che Din, N., & Ong, H. C. (2017). Gender differences and psychological factors associated with suicidal ideation among youth in Malaysia. *Psychology research and behavior management*, 10, 129–135. https://doi.org/10.2147/PRBM.S125176

Jobe-Shields, L., Cohen, R., & Parra, G. R. (2011). Patterns of Change in Children's Loneliness: Trajectories from Third Through Fifth Grades. *Merrill-Palmer Quarterly*, 57(1), 25–47. www.jstor.org/stable/23098054

Kearns, A., Whitley, E., Tannahill, C., & Ellaway, A. (2015). Loneliness, social relations and health and well-being in deprived communities. *Psychology, health & medicine*, 20(3), 332–344. https://doi.org/10.1080/13548506.2014.940354

Kessler, R. C., Amminger, G. P., Aguilar-Gaxiola, S., Alonso, J., Lee, S., & Üstün, T. B. (2007). Age of onset of mental disorders: a review of recent literature. *Current Opinion in Psychiatry*, 20(4), 359–364. https://journals.lww.com/co-psychiatry/Fulltext/2007/07000/Age_of_onset_of_mental_disorders__a_review_of.10.aspx

Kessler, R. C., Angermeyer, M., Anthony, J. C., De Graaf, R., Demyttenaere, K., Gasquet, I., De Girolamo, G., Gluzman, S., Gureje, O., Haro, J. M., Kawakami, N., Karam, A., Levinson, D., Medina Mora, M. E., Oakley Browne, M. A., Posada-Villa, J., Stein, D. J., Adley Tsang, C. H., Aguilar-Gaxiola, S., Alonso, J., Lee, S., Heeringa, S., Pennell, B.-E., Berglund, P., Gruber, M. J., Petukhova, M., Chatterji, S., & Üstün, T. B. (2007). Lifetime prevalence and age-of-onset distributions of mental disorders in the World Health Organization's World Mental Health Survey Initiative. *World psychiatry : official journal of the World Psychiatric Association (WPA)*, 6(3), 168–176. https://pubmed.ncbi.nlm.nih.gov/18188442

Marsh, I. C., Chan, S. W. Y., & MacBeth, A. (2018, 2018/08/01). Self-compassion and Psychological Distress in Adolescents —a Meta-analysis. *Mindfulness*, 9(4), 1011–1027. https://doi.org/10.1007/s12671-017-0850-7

Marthoenis, Meutia, I., Fathiariani, L., & Sofyan, H. (2018, 2018/12/01). Prevalence of depression and anxiety among college students living in a disaster-prone region. *Alexandria Journal of Medicine*, 54(4), 337–340. https://doi.org/10.1016/j.ajme.2018.07.002

Marthoenis, M., & Schouler-Ocak, M. (2022, 2022/01/21). Investigating the Prevalence of Psychological Distress and Its Associated Factors Among Indonesian Adolescents: A Cross-Sectional Study. *Child and Adolescent Social Work Journal*. https://doi.org/10.1007/s10560-022-00818-8

Mayor, E. (2015, 2015-June-09). Gender roles and traits in stress and health [Perspective]. 6(779). https://doi.org/10.3389/fpsyg.2015.00779

McKenzie, S. K., Collings, S., Jenkin, G., & River, J. (2018). Masculinity, Social Connectedness, and Mental Health: Men's Diverse Patterns of Practice. *American journal of men's health*, 12(5), 1247–1261. https://doi.org/10.1177/1557988318772732

McLachlan, K. J. J., & Gale, C. R. (2018). The effects of psychological distress and its interaction with socioeconomic position on risk of developing four chronic diseases. *Journal of psychosomatic research*, 109, 79–85. https://doi.org/10.1016/j.jpsychores.2018.04.004

Ministry of Health of Indonesia. (2015). Perilaku berisiko kesehatan pada pelajar SMP dan SMA di Indonesia (Healthy risk behavior among junior and senior high school students in Indonesia).

Ministry of Health of Indonesia. (2018). Laporan Nasional Riset Kesehatan Dasar 2018 (National Report of the 2018 Basic Health Research). http://repository.litbang.kemkes.go.id/3514/

Moore, S. E., Norman, R. E., Suetani, S., Thomas, H. J., Sly, P. D., & Scott, J. G. (2017). Consequences of bullying victimization in childhood and adolescence: A systematic review and meta-analysis. *World journal of psychiatry*, 7(1), 60–76. https://doi.org/10.5498/wjp.v7.i1.60

Mutyahara, S., & Prasetyawati, W. (2018). Association of Peer Acceptance and Depressive Symptoms among High School Student in DKI Jakarta. Universitas Indonesia International Psychology Symposium for Undergraduate Research (UIPSUR 2017),

Orben, A., Tomova, L., & Blakemore, S. J. (2020, Aug). The effects of social deprivation on adolescent development and mental health. *Lancet Child Adolesc Health*, 4(8), 634–640. https://doi.org/10.1016/s2352-4642(20)30186-3

Parker, G., & Brotchie, H. (2010, 2010/10/01). Gender differences in depression. *International Review of Psychiatry*, 22(5), 429–436. https://doi.org/10.3109/09540261.2010.492391

Peltzer, K., & Pengpid, S. (2017a). Hunger and Psychobehavioural Problems Among Adolescents in the Association of Southeast Asian Nations (ASEAN) Member Countries [Original Article]. 11(3), e8185. https://doi.org/10.5812/ijpbs.8185

Peltzer, K., & Pengpid, S. (2017b). Loneliness and Health Risk Behaviors Among ASEAN Adolescents [Original Article]. 11(3), e7691. https://doi.org/10.5812/ijpbs.7691

Pengpid, S., & Peltzer, K. (2019, 2019/11/01/). Bullying victimization and externalizing and internalizing symptoms among in-school adolescents from five ASEAN countries. *Children and Youth Services Review*, 106, 104473. https://doi.org/10.1016/j.childyouth.2019.104473

Pengpid, S., & Peltzer, K. (2020a, 2020/09/29). Prevalence and associated factors of psychological distress among a national sample of in-school adolescents in Morocco. *BMC Psychiatry*, 20(1), 475. https://doi.org/10.1186/s12888-020-02888-3

Pengpid, S., & Peltzer, K. (2020b). Prevalence of Worry-Induced Sleep Disturbance and Associated Factors among a National Sample of In-School Adolescents in Lebanon. 10(10), 148. https://www.mdpi.com/2076-328X/10/10/148

Pengpid, S., & Peltzer, K. (2020c, 2020/06/01). Psychological Distress and Its Associated Factors Among School-Going Adolescents in Tanzania. *Psychological Studies*, 65(2), 174–181. https://doi.org/10.1007/s12646-020-00550-2

Pengpid, S., & Peltzer, K. (2021, 2021/04/30). Prevalence and associated factors of psychological distress among a national sample of in-school adolescents in Liberia. *Journal of Psychology in Africa*, 31(2), 197–202. https://doi.org/10.1080/14330237.2021.1903158

Platt, B., Kadosh, K. C., & Lau, J. Y. F. (2013, 2013/09/01). The role of peer rejection in adolescent depression [https://doi.org/10.1002/da.22120]. *Depression and Anxiety*, 30(9), 809–821. https://doi.org/10.1002/da.22120

Polanczyk, G. V., Salum, G. A., Sugaya, L. S., Caye, A., & Rohde, L. A. (2015, 2015/03/01). Annual Research Review: A meta-analysis of the worldwide prevalence of mental disorders in children and adolescents [https://doi.org/10.1111/jcpp.12381]. *Journal of Child Psychology and Psychiatry*, 56(3), 345–365. https://doi.org/10.1111/jcpp.12381

Putra, I. G. N. E., & Dendup, T. (2022). Health and behavioural outcomes of bullying victimisation among Indonesian adolescent students: findings from the 2015 Global School-based Student Health Survey. *Psychology, Health & Medicine*, 27(3), 513–527. https://doi.org/10.1080/13548506.2020.1826546

Putra, I. G. N. E., & Artini, N. N. A. (2022). Mediation by psychological distress in the association between bullying victimization and suicidal behaviors among adolescents. *Jurnal Berkala Epidemiologi*, 10(1), 1–10. https://doi.org/10.20473/jbe.V10I12022.1-10

Putra, I. G. N. E., Karin, P., & Ariastuti, N. L. P. (2019, Jun 1). Suicidal ideation and suicide attempt among Indonesian adolescent students. *Int J Adolesc Med Health*. https://doi.org/10.1515/ijamh-2019-0035

Rani, D., Singh, J. K., Acharya, D., Paudel, R., Lee, K., & Singh, S. P. (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. https://doi.org/10.3390/ijerph15081585

Rescorla, L., Achenbach, T. M., Ivanova, M. Y., Dumenci, L., Almqvist, F., Bilenberg, N., Bird, H., Broberg, A., Dobrean, A., Döpfner, M., Erol, N., Forns, M., Hannesdottir, H., Kanbayashi, Y., Lambert, M. C., Leung, P., Minaei, A., Mulatu, M. S., Novik, T. S., Oh, K.-J., Roussos, A., Sawyer, M., Simsek, Z., Steinhausen, H.-C., Weintraub, S., Metzke, C. W., Wolanczyk, T., Zilber, N., Zukauskiene, R., & Verhulst, F. (2007). Epidemiological comparisons of problems and positive qualities reported by adolescents in 24 countries. *Journal of Consulting and Clinical Psychology*, 75(2), 351–358. https://doi.org/10.1037/0022-006X.75.2.351

Sauter, S. R., Kim, L. P., & Jacobsen, K. H. (2020, 2020/02/01). Loneliness and friendlessness among adolescents in 25 countries in Latin America and the Caribbean. *Child and Adolescent Mental Health*, 25(1), 21–27. https://doi.org/10.1111/camh.12358

Siziya, S., & Mazaba, M. L. (2015, 2015-July-16). Prevalence and Correlates for Psychosocial Distress Among In-School Adolescents in Zambia [Original *Research*]. **3**(180). https://doi.org/10.3389/fpubh.2015.00180

Stansfeld, S. A., Fuhrer, R., Shipley, M. J., & Marmot, M. G. (2002). Psychological distress as a risk factor for coronary heart disease in the Whitehall II Study. *International Journal of Epidemiology*, **31**(1), 248–255. https://doi.org/10.1093/ije/31.1.248

Swearer, S. M., & Hymel, S. (2015, May-Jun). Understanding the psychology of bullying: Moving toward a social-ecological diathesis-stress model. *Am Psychol*, **70**(4), 344–353. https://doi.org/10.1037/a0038929

Tian, S., Zhang, T.-Y., Miao, Y.-M., & Pan, C.-W. (2021, 2021/03/01/). Psychological distress and parental involvement among adolescents in 67 low-income and middle-income countries: A population-based study. *Journal of Affective Disorders*, **282**, 1101–1109. https://doi.org/10.1016/j.jad.2021.01.010

Tsaousis, I. (2016, 2016/11/01/). The relationship of self-esteem to bullying perpetration and peer victimization among schoolchildren and adolescents: A meta-analytic review. *Aggression and Violent Behavior*, **31**, 186–199. https://doi.org/10.1016/j.avb.2016.09.005

Tseng, K. K., Park, S. H., Shearston, J. A., Lee, L., & Weitzman, M. (2017). Parental Psychological Distress and Family Food Insecurity: Sad Dads in Hungry Homes. *Journal of Developmental & Behavioral Pediatrics*, **38**(8), 611–618. https://journals.lww.com/jrnldbp/Fulltext/2017/10000/Parental_Psychological_Distress_and_Family_Food.6.aspx

Vancampfort, D., Ashdown-Franks, G., Smith, L., Firth, J., Van Damme, T., Christiaansen, L., Stubbs, B., & Koyanagi, A. (2019, 2019/05/15/). Leisure-time sedentary behavior and loneliness among 148,045 adolescents aged 12–15 years from 52 low- and middle-income countries. *Journal of Affective Disorders*, **251**, 149–155. https://doi.org/10.1016/j.jad.2019.03.076

Vancampfort, D., Stubbs, B., Firth, J., Van Damme, T., & Koyanagi, A. (2018, 2018/08/08). Sedentary behavior and depressive symptoms among 67,077 adolescents aged 12–15 years from 30 low- and middle-income countries. *International Journal of Behavioral Nutrition and Physical Activity*, **15**(1), 73. https://doi.org/10.1186/s12966-018-0708-y

Vancampfort, D., Van Damme, T., Stubbs, B., Smith, L., Firth, J., Hallgren, M., Mugisha, J., & Koyanagi, A. (2019, 2019/06/01/). Sedentary behavior and anxiety-induced sleep disturbance among 181,093 adolescents from 67 countries: a global perspective. *Sleep Medicine*, **58**, 19–26. https://doi.org/10.1016/j.sleep.2019.01.048

Widyasari, D. C., & Yuniardi, M. S. (2019). The Prevalence of Psychological Distress among Adolescents: An Initial Study of Adolescents' Mental Health in Malang, Indonesia. 4th ASEAN Conference on Psychology, Counselling, and Humanities (ACPCH 2018),

World Health Organization. (2005). *Child and adolescent mental health policies and plans*. World Health Organization. https://www.who.int/mental_health/policy/services/9_child%20ado_WEB_07.pdf?ua=1

World Health Organization. (2020). Adolescent mental health. Retrieved 14 May from https://www.who.int/news-room/fact-sheets/detail/adolescent-mental-health