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MEDIATION BY PSYCHOLOGICAL DISTRESS IN THE ASSOCIATION BETWEEN BULLYING VICTIMIZATION AND SUICIDAL BEHAVIORS AMONG ADOLESCENTS

Mediasi oleh Distres Psikologis pada Hubungan antara Korban Bullying dan Perilaku Bunuh Diri pada Remaja

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ABSTRACT

Background: Bullying victimization has been found to be associated with suicidal behaviors among adolescents. However, there is a lack of studies examining the mediating pathways. **Purpose:** This study aims to investigate psychological distress as a candidate mediator to the association between bullying victimization and suicidal behaviors. **Methods:** This was a cross-sectional study involving 10,883 records of school-going adolescents, retrieved from the 2015 Indonesia Global School-based Student Health Survey (IGSHS). The primary independent variable was the experience of being bullied in the last 30 days. In contrast, the dependent variable was any suicidal behaviors (i.e., suicidal ideation, planning, or attempt) reported in the last 12 months. Psychological distress as a candidate mediator was measured as loneliness, anxiety-induced sleep disturbance (in the past 12 months), and a combination of both measures – psychological distress. Causal mediation analysis with single mediation models was used to investigate the mediation using psychological distress measures by adjusting for potential confounders. **Results:** This study found conceivable pathways linking bullying victimization to suicidal behaviors through all measures of psychological distress with statistically significant Natural Indirect Effect (NIE): loneliness (aOR=1.17; 95%CI=1.11-1.27), anxiety-induced sleep disturbance (aOR=1.16; 95%CI=1.10-1.27), and psychological distress (aOR=1.21; 95%CI=1.15-1.31). The proportions mediated by loneliness, anxiety-induced sleep disturbance, and psychological distress accounted for 24.58%, 23.03%, 29.27%, respectively. Findings also suggest that the mediation by all measures of

psychological distress persisted among both genders, with higher proportions mediated reported among boys. **Conclusion:** Psychological distress mediated the associations between bullying victimization and suicidal behaviors among Indonesian adolescents.

ABSTRAK

Latar Belakang: *Korban bullying berkaitan dengan perilaku bunuh diri pada remaja. Akan tetapi, masih terdapat sedikit penelitian terkait faktor yang memediasi hubungan tersebut.* **Tujuan:** *Penelitian ini bertujuan untuk menyelidiki distres psikologis sebagai kandidat mediator dari hubungan antara korban bullying dengan perilaku bunuh diri.* **Metode:** *Penelitian ini menggunakan pendekatan cross-sectional study dengan melibatkan 10,883 remaja sekolah yang datanya diperoleh dari Indonesia Global School-based Student Health Survey tahun 2015. Variabel bebas utama yaitu pengalaman menjadi korban bullying dalam 30 hari terakhir, sedangkan variabel tergantung yaitu perilaku bunuh diri (ide atau pemikiran, perencanaan, dan percobaan bunuh diri) yang dilaporkan dalam 12 bulan terakhir. Distress psikologis sebagai kandidat mediator diukur sebagai perasaan kesepian, gangguan tidur yang dipicu kecemasan, dan kombinasi dari kedua pengukuran tersebut yang selanjutnya disebut distres psikologis. Analisis mediasi kausal dengan model mediasi tunggal digunakan untuk menyelidiki distres psikologis sebagai kandidat mediator dengan mengontrol pengaruh variabel perancu.* **Hasil:** *Penelitian ini menemukan beberapa jalur potensi yang mengubungkan korban bullying dengan perilaku bunuh diri melalui semua pengukuran distres psikologis dengan natural indirect effect (NIE) yang signifikan secara statistik : kesepian (aOR=1,17; 95%CI=1,11-1,27), gangguan tidur yang dipicu oleh kecemasan (aOR=1,16; 95%CI=1,10-1,27), dan kombinasi distres psikologis (aOR=1,21;95%CI=1,15-1,31). Proporsi mediasi oleh kesepian, gangguan tidur yang dipicu oleh kecemasan, dan distres psikologis yaitu masing-masing sebesar 24,58%, 23,03%, 29,27%. Hasil penelitian ini juga memperoleh bahwa mediasi oleh semua pengukuran distres psikologis terjadi pada laki-laki dan perempuan dengan proporsi mediasi yang lebih besar pada laki-laki.* **Simpulan:** *Distres psikologis memediasi hubungan antara korban bullying dengan perilaku bunuh diri pada remaja Indonesia.*

INTRODUCTION

Adolescence is a stage of human development that is vulnerable to mental health problems as they experience cognitive, physical, and social changes (Marsh, Chan, & Macbeth, 2018). The World Health Organization (WHO) estimated that mental health problems account for 16% of the global burden of disease and injury among adolescents aged 10-19 years (World Health Organization, 2008). Globally, the prevalence of adolescent mental health problems ranges from 10-20% and around half of all mental health problems start before age 15 years, but most of the cases are undetectable (Kessler et al., 2007).

Suicide is estimated as the fourth leading cause of mortality among adolescents aged 15-19 years (World Health Organization, 2008).

Adolescent suicide rates vary by country, ranging from 1.60 in the Bahamas to 24.30 per 100,000 in Lithuania among those aged 15-29 years (Cha et al., 2018). Suicidal behaviors are defined as a range of behaviors that cover suicidal ideation, planning, attempting, and completing suicide (Putra, Karin, & Ariastuti, 2019). An analysis involving data from 82 countries showed that the pooled prevalence of suicidal ideation among adolescents is 14.00% (Biswas et al., 2020).

Bullying victimization among adolescents can be defined as any unpleasant experience of being exposed to adverse actions by peers, including verbal and physical bullying, and being socially ignored (Kusumawardani et al., 2015; Putra & Dendup, 2020). A study using data from multiple countries found some correlates of bullying victimization, such as younger age, substance use, unfavorable mental health, and less peer support (Aboagye et al., 2021). No global figure is available to present the number of suicide deaths attributed to bullying victimization. Bullying victimization, however, was found to be associated with a range of adolescent mental health problems (e.g., anxiety, loneliness, depression, etc.), including suicidal behaviors (Moore et al., 2017; Pengpid & Peltzer, 2019; Tang et al., 2020)

To date, it remains unclear regarding the pathway in which bullying victimization may influence suicidal behaviors among adolescents. Psychological distress – which is defined as symptoms of deeply unpleasant feelings or emotional suffering, such as anxiety, depressive symptoms, etc (McClelland, Evans, Nowland, Ferguson, & O'Connor, 2020) – might mediate the association. Previous studies were examining factors associated with psychological distress among adolescents in Morocco and Liberia assessed psychological distress using a combined measure of loneliness and anxiety-induced sleep disturbance (Pengpid & Peltzer, 2020, 2021). Past work found that bullying victimization is associated with psychological distress (Moore et al., 2017; Pengpid & Peltzer, 2020, 2021) and psychological distress correlates with suicidal behaviors (Eskin et al., 2016). Based on these previous findings, psychological distress might lie in the association between bullying victimization and suicidal behaviors (Putra, Karin, & Ariastuti, 2019). A lack of studies investigating mediation indicates that more studies are needed to address this research gap.

According to data from the Global Health Repository (GHO) in 2019, suicide rates among adolescents (10-19 years) and young adults (20-29 years) in Indonesia were 2 and 5.10 per 100,000 people, respectively (Ministry of Health RI, 2019). No national reports indicate the suicide rates due to bullying victimization among adolescents. Previous studies examined the association between bullying victimization and suicidal behaviors among Indonesian school-going adolescents (Putra & Dendup, 2020; Putra, Karin, & Ariastuti, 2019). Those studies, however, did not investigate the mechanism or mediator in which bullying victimization may influence suicidal behaviors. This study aimed to investigate the mediation by psychological distress in the association between bullying victimization and suicidal behaviors among Indonesian adolescents. This study also used causal mediation analysis which has been increasingly used in public health studies to test a mediator of the association.

METHODS

This study utilized data from the 2nd round of Indonesia Global School-based Student Health Survey (IGSHS) conducted in 2015. This survey was undertaken by the Ministry of Health of Indonesia in collaboration with the World Health Organisation (WHO) and the Center for Disease Control and Prevention (CDC). IGSHS primarily aimed to document school-going adolescents' risk and protective factors of health-related behaviors. Anonymous questionnaires were administered to students in 75 junior and senior high schools, predominantly in Sumatera and Java islands, and other islands in Indonesia. The 2015 IGSHS applied two-stage clustered probability sampling by selecting schools using probability proportional to size (PPS) sampling. Then, selecting classrooms used systematic sampling. The 2015 IGSHS has obtained ethics approval from the Ethics Commission of the Ministry of Health (LB.02.01/5.2/KE.158/2015). Further information on the 2015 IGSHS's content, methodology, dataset, and general findings was available online (Kusumawardani et al., 2015). This present study only analyzed adolescents' records with complete information on suicidal behaviors as the dependent variable (n=10,883 out of 11,142 records available in the 2015 IGSHS).

The dependent variable of this study was suicidal behaviors, defined as whether adolescents had ever seriously considered attempting, made a plan, or attempted suicide in the last 12 months before the survey. The leading independent variable was the experience of being bullied in the

previous 30 days. This study investigated psychological distress as potential mediating variables, measured as loneliness, anxiety-induced sleep disturbance (in the last 12 months), and a combination of both measures (i.e., psychological distress), following the definition provided in previous studies (Pengpid & Peltzer, 2020, 2021). In addition, the influence of potential confounders, such as gender, age, the experience of hunger (as a proxy for socioeconomic status), parental and peer support, were controlled in the analysis (Putra & Dendup, 2020). Table 1 provided the description of variables used in this study.

Descriptive statistics were used to present the sample characteristics. This study used a single causal mediation analysis by fitting each psychological distress measure in separate mediation models. Causal mediation analysis used the counterfactual framework to decompose the total effect of the exposure. This analysis pointed its impact on outcomes to pathways that do not involve the mediator – Natural Direct Effect (NDE) and the pathway through the mediator – natural indirect effect (NIE) (Dendup, Feng, O'Shaughnessy, & Astell-Burt, 2021). This mediation analysis helps address the limitations of the traditional approach. The estimation of the indirect effect by combining two standard regression coefficients in the conventional approach might lead to the incorrect statistical analysis and flawed conclusion (Liu, Ulbricht, Chrysanthopoulou, & Lapane, 2016; Putra, Astell-Burt, Cliff, Vella, & Feng, 2021).

Table 1.
Description of variables from the 2015 IGSHS

Variables	Questions from the 2015 IGSHS	Response options	Coding scheme
Independent variable			
Bullying	"During the past 30 days, on how many days were you bullied?"	"1= 0 days to 7= all 30 days"	"1=0 (no) and ≥2=1 (yes)"
Candidate mediators			
Loneliness	"During the past 12 months, how often have you felt lonely?"	"1=never to 5=always"	"1-3=0 (no) and 4-5=1 (yes)"
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 (no) and 4-5=1 (yes)"
Psychological distress	Initial responses for 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 (no) and 3-6=1 (yes)"
Dependent variable			
Suicidal behaviors	"Seriously considered attempting, made a plan, or attempted suicide during the 12 months before the survey."	A "yes" response for three suicidal behaviors was scored 1 for each and then added together.	"0=0 (no) and 1-3=1 (yes)"
Potential confounders			
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"
Experience of 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 (no) and 4-5=1 (yes)"
Parental support	"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 (no) and 4-5=1 (yes)"
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 (no) and 4-5=1 (yes)"

In addition, causal mediation analysis allows the presence of exposure-mediator interaction and can be used for mediation models with continuous and categorical variables (Valeri & VanderWeele, 2013). This mediation method has been increasingly employed by studies in public health using longitudinal (Dendup, Feng, O'Shaughnessy, & Astell-Burt, 2021; Putra, Astell-Burt, Cliff, Vella, & Feng, 2021) and cross-sectional study designs (Tarp et al., 2018).

For this study, bullying victimization as the exposure, psychological distress as the candidate mediator, and suicidal behaviors were fitted in separate single mediation models by controlling the influence of gender, age, the experience of hunger, and parental and peer support. This study followed published guidelines in conducting causal mediation analysis (Valente, Rijnhart, Smyth, Muniz, & MacKinnon, 2020). Direct, indirect, and total effects were reported as adjusted odds ratio (OR) along with bias-corrected 95% confidence intervals (CIs) from bootstrapping for 1000 iterations. Proportion mediated was also calculated using the following formula: NDE*(NIE-1)/(NDE*NIE-1) (Dendup et al., 2021).

RESULTS

Table 2 shows the characteristics of the samples. Almost balanced proportions between girls and boys (51.49% vs. 48.27%) were reported in this study. The majority of adolescents are 15 years and under (82.13%). Less than 5% of the adolescents notified that they often went hungry because of not enough food at home. Moreover, around one out of three adolescent students reported receiving adequate parental (34.54%) and peer support (39.10%). Comparing genders, girls were found to receive higher percentages of parental and peer support than boys.

The prevalence of bullying victimization in the last 30 days among Indonesian school-going adolescents was 18.61% with a higher prevalence reported among boys than girls (21.08% vs. 16.27%). For psychological distress measures, 5.73% and 4.30% of adolescents notified feeling lonely and anxious during the previous 12 months. The overall percentage of combined physical distress was 7.58%. Loneliness and combined psychological distress were found to be more prevalent among female students, but male students were observed with a slightly higher prevalence of anxiety-induced sleep disturbance. Moreover, the pervasiveness of any suicidal behaviors was 8.82%. The majority was found to be almost similar between females and males (8.95% vs. 8.64%).

Table 3 presents the results from causal mediation analysis. Findings suggest that all measures of psychological distress (i.e., loneliness, anxiety-induced sleep disturbance, and combined psychological distress) partially mediated the association between bullying victimization and suicidal behaviors, irrespective of gender. For example, the indirect effect of bullying victimization on suicidal behaviors through loneliness presented as an adjusted odds ratio (AOR) was 1.17 (95%CI=1.11–1.27). This is interpreted as if all adolescents reported to be the party being bullied, the odds of suicidal behaviors would be 17% higher if they were lonely than those who were not. In addition, the odds of suicidal behaviors would be 16% (AOR=1.16; 95%CI=1.10–1.27) and 21% (AOR=1.21; 95%CI=1.15–1.31) higher if adolescents reported anxiety-induced sleep disturbance and combined psychological distress than those who did not, respectively. The interpretation of these findings was informed by published literature (Dendup et al., 2021). The proportions mediated through loneliness, anxiety-induced sleep disturbance, and combined psychological distress were 24.58%, 23.03%, and 29.27%, respectively. Moreover, the proportions mediated by loneliness and combined psychological distress were found higher among boys than girls.

DISCUSSION

Overall, this current study found that all measures of psychological distress partially mediated the association between bullying victimization and suicidal behaviors after considering the influence of age, gender, experience of hunger, and parental and peer support. Combined psychological distress was found to be more mediated than loneliness and anxiety-induced sleep disturbance. In addition, the mediation by all measures of psychological distress persisted among both genders that also help strengthen the findings. Boys were reported with higher proportions mediated loneliness and psychological distress than girls.

Table 2.
Characteristics of the samples

Variables	Females		Males		All samples	
	n	%*	n	%*	n	%*
Age group						
≤ 15 years	4,789	82.08	4,030	82.34	8,831	82.13
> 15 years	1,148	17.91	889	17.66	2,038	17.76
Missing or not reported	*1*	*0.01*			*14*	*0.11*
Experience of hunger						
No	5,695	96.11	4,659	94.94	10,380	95.55
Yes	224	3.59	233	4.52	457	4.03
Missing or not reported	*19*	*0.30*	*27*	*0.54*	*46*	*0.41*
Parental support						
No	3,677	61.48	3,293	67.28	6,984	64.28
Yes	2,185	37.39	1,556	31.48	3,753	34.54
Missing or not reported	*76*	*1.12*	*70*	*1.24*	*146*	*1.18*
Peer support						
No	3,323	55.08	3,176	64.78	6,514	59.77
Yes	2,538	43.79	1,680	34.11	4,228	39.10
Missing or not reported	*77*	*1.13*	*63*	*1.12*	*141*	*1.13*
Bullying victimization						
No	4,644	78.67	3,476	70.85	8,139	74.89
Yes	975	16.27	1,043	21.08	2,024	18.61
Missing or not reported	*319*	*5.06*	*400*	*8.06*	*720*	*6.50*
Loneliness						
No	5,505	93.02	4,641	94.29	10,170	93.63
Yes	406	6.59	234	4.82	641	5.73
Missing or not reported	*27*	*0.38*	*44*	*0.89*	*72*	*0.64*
Anxiety-induced sleep disturbance						
No	5,684	95.86	4,686	95.31	10,395	95.59
Yes	249	4.08	223	4.52	473	4.30
Missing or not reported	*5*	*0.07*	*10*	*0.17*	*15*	*0.12*
Psychological distress						
No	5,386	91.13	4,545	92.34	9,954	91.70
Yes	521	8.43	323	6.65	846	7.58
Missing or not reported	*31*	*0.44*	*51*	*1.02*	*83*	*0.72*
Suicidal behaviors						
No	5,376	91.05	4,494	91.36	9,891	91.18
Yes	562	8.95	425	8.64	992	8.82
Total	5,938	100.00	4,919	100.00	10,883	100.00

weighted percentages; 26 observations with missing values on gender

Mediation by psychological distress on the association between bullying victimization and suicidal behaviors could be explained by previous study findings on the association between bullying victimization and psychological distress, and between psychological distress and suicidal behaviors. Previous studies found that bullying is associated with psychological distress, including loneliness and anxiety-induced sleep disturbance (Moore et al., 2017; Pengpid & Peltzer, 2019; Putra & Dendup, 2020). Bullying victimization is a negative form of peer interactions and a stressful life event that can lead to psychological distress (Plexousakis, Kourkoutas, Giovazolias, Chatira, & Nikolopoulos, 2019). Those who are bullied also tend to have low self-esteem and be more anxious about peer interactions (Tsaousis, 2016). Bullying victimization can negatively impact socio-emotional functioning and adjustment that can lead to difficulties in making friends. This situation can further deliver low-quality interactions with peers and less social support, increasing the feeling of loneliness (Putra & Dendup, 2020).

Table 3.
Mediation by the measures of psychological distress in the association between bullying victimization and suicidal behaviors

Candidate mediators	All samples AOR (95% CI)	Females AOR (95% CI)	Males AOR (95% CI)
Loneliness			
Natural direct effect (NDE)	2.09 (1.76 – 2.45)	2.05 (1.73 – 2.41)	1.86 (1.47 – 2.36)
Natural indirect effect (NIE)	1.17 (1.11 – 1.27)	1.17 (1.11 – 1.27)	1.22 (1.13 – 1.41)
Total effect	2.44 (2.08 – 2.89)	2.39 (2.05 – 2.85)	2.27 (1.83 – 3.00)
Proportion mediated (%)	24.58	24.92	32.24
Anxiety-induced sleep disturbance			
Natural direct effect (NDE)	2.15 (1.83 – 2.51)	2.10 (1.81 – 2.45)	1.94 (1.55 – 2.48)
Natural indirect effect (NIE)	1.16 (1.10 – 1.27)	1.16 (1.10 – 1.27)	1.14 (1.08 – 1.27)
Total effect	2.49 (2.15 – 2.99)	2.43 (2.11 – 2.93)	2.20 (1.80 – 2.86)
Proportion mediated (%)	23.03	23.40	22.42
Psychological distress			
Natural direct effect (NDE)	2.03 (1.75 – 2.38)	1.99 (1.71 – 2.35)	1.82 (1.44 – 2.29)
Natural indirect effect (NIE)	1.21 (1.15 – 1.31)	1.21 (1.15 – 1.32)	1.21 (1.14 – 1.41)
Total effect	2.46 (2.11 – 2.88)	2.41 (2.09 – 2.90)	2.21 (1.77 – 2.81)
Proportion mediated (%)	29.27	29.68	31.79

aOR=adjusted odds ratio; CI=confidence interval
Separate mediation models were developed for each measure of psychological distress. The model was adjusted for age, gender, the experience of hunger, parental support, and peer support. Proportion mediated was calculated using the following formula: NDE*(NIE-1)/(NDE*NIE-1).

Psychological distress might be an intermediate outcome of bullying victimization, which can further trigger suicidal behaviors (Putra & Dendup, 2020). Findings from past work suggest that loneliness and/or anxiety-induced sleep disturbance are associated with suicidal behaviors among adolescents in different study settings (McClelland et al., 2020; Putra, Karin, & Ariastuti, 2019). Psychological distress, such as loneliness might negatively influence social lives among adolescents that play essential roles in the development of suicidal risk. Adolescents with loneliness are more likely to present low social skills in maintaining social relationships (Lodder, Goossens, Scholte, Engels, & Verhagen, 2016). They are also more likely to suffer from other mental health problems and have increased feelings of discomfort and conflict (Loades et al., 2020). This psychological distress may increase the level of painful feelings, leading to suicidal behaviors (Putra & Dendup, 2020; Putra, Karin, & Ariastuti, 2019).

This study also highlighted that proportions mediated by loneliness and combined psychological distress was higher among boys. Even though the prevalence of self-reported loneliness and psychological distress was higher among girls (Table 2), the influence of loneliness and psychological distress on suicidal behaviors might be more significant among boys. These findings can be interpreted within the socio-cultural contexts of Indonesia. In most Asian countries, including Indonesia, males are expected to be strong emotionally. This social expectation can make them less open up and less likely to share their feelings with friends and families. In addition, they are less frequent than females to seek help when experiencing psychological distress (McKenzie, Collings, Jenkin, & River, 2018). Further investigation is needed to explore gender differences in the mediation by psychological distress on the association between bullying victimization and suicidal behaviors among adolescents.

Findings from this study suggest the importance of anti-bullying programs implemented in schools that should play roles in preventing bullying and mitigating the detrimental effects of bullying among adolescent victims. The implementation of anti-bullying programs is essential to avert bullying, its intermediate consequences (e.g., psychological distress), and the subsequent adverse outcomes (e.g., suicidal behaviors). A collaboration between teachers, parents, related stakeholders in the education, child protection, health sectors, and non-governmental organizations (NGOs) is needed to design and implement the programs in a targeted manner.

Research Limitations

Findings from this study should be carefully interpreted because of its limitations. This study was cross-sectional in design which implies that the causal relationship can not be deduced. Findings might also be subjected to reverse causation due to the nature of cross-sectional data. In addition, samples were predominantly collected in Java and Sumatera islands, and hence, findings might not be widely generalized to all Indonesian school-going adolescents.

The different recall period between the measure of bullying victimization (in the last 30 days), psychological distress and suicidal behaviors (in last 12 months) might affect the findings to some extent. In addition, a long recall period of 12 months might also lead to recall bias. It is also important to note that the findings might be influenced by social desirability bias. Having suicidal behaviors might not be viewed as appropriate due to cultural and religious values in Indonesia (Putra, Karin, & Ariastuti, 2019), which might lead suicidal behaviors to being under-reported. However, the use of anonymous self-administered questionnaires might help minimize this bias. Furthermore, only psychological distress was examined in this study, signalling more investigation on other potential pathways is warranted. Future studies need to take into account the limitations of this study.

CONCLUSION

Psychological distress partially mediated the associations between bullying victimization and suicidal behaviors. Anti-bullying programs implemented in school settings might help reduce bullying and the occurrence of psychological distress, which in turn prevent suicidal behaviors among adolescents. Future studies with rigorous methodology (e.g., longitudinal study), and testing other potential pathways are warranted.

CONFLICT OF INTEREST

The author declares that there is no conflict of interest.

AUTHOR CONTRIBUTIONS

IGNEP: conceptualization, methodology, formal analysis, writing-original draft preparation, writing-reviewing and editing; NNAA: writing-original draft preparation.

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