

## Meta Analysis: The Effect of Bullying on Adolescents on Mental Health and Depression

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### ABSTRACT

**Background:** Bullying is an act of aggression that is intentional and repeated physically, psychologically, verbally, and cyber which can cause various health problems. Bullying is one of the causes of poor mental health conditions in adolescents whose impact can continue into adulthood. This study was aimed to assess the magnitude of the effect of bullying on mental health and depression based on the scores obtained from several previous similar studies.

**Subjects and Method:** The design of this research study was a systematic review and meta-analysis. The primary articles used were obtained from online databases (PubMed, Google Scholar, ResearchGate, and Springer Link) published in 2012-2022. Population: teenagers. Intervention: bullying. Comparison: not experiencing bullying. Outcomes: mental health and depression. The keywords used in the primary article search were "Bullying" AND "Mental Health Problem" OR "Psychological Disorder" OR "Psychological Distress" AND "Depression" OR "Depressive Disorder" AND "Adolescent" OR "Teenager". This study uses full-text articles with a cross-sectional design and contains an aOR (adjusted Odds Ratio) value. The selection of articles was carried out using PRISMA flow diagrams. Articles were analyzed using the Review Manager 5.3 application.

**Results:** There are 7 articles from Saudi Arabia, Taiwan, Italy, Morocco, Sweden, Australia, and Ethiopia on bullying and adolescent mental health, as well as 8 articles from Saudi Arabia, US, Italy, China, Brazil, Canada, Australia, and Malaysia on bullying and depression in adolescents. The results of the meta-analysis showed that bullying was statistically significant in increasing the occurrence of mental health disorders (aOR= 2.48; 95%CI= 1.64 to 3.74; p< 0.001) and depression (aOR= 2.74; 95%CI= 2.29 to 3.28; p< 0.0001) in teenagers.

**Conclusion:** The experience of bullying can increase the risk of mental health disorders and depression in adolescents.

**Keywords:** Bullying, mental health, depression, youth.

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### BACKGROUND

Currently, mental health is getting more and more attention, including mental health in adolescents which is considered increasingly worrying (Bruckauf, 2017).

Globally, one in seven children aged 10-19 years has a mental disorder, and accounts for 13% of the global burden of disease in this age group (WHO, 2021). Mental health conditions that include behavioral and

mental health problems are the leading cause of adjustment disorders in adolescents and young people worldwide (Bradshaw et al., 2014).

Adolescence is an important period for developing social and emotional habits that are important for mental well-being. At this time, physical, emotional and social changes can make adolescents vulnerable to mental health problems (WHO, 2021). Various aspects of life including poverty, bullying, traumatic events, and conflict experiences can have an adverse impact on mental health conditions among adolescents (Bradshaw et al., 2014).

Bullying or bullying is defined as an intentional and repeated act of aggression that is physical (e.g. hitting, stealing), verbal (e.g. harassing, threatening, teasing or mocking in name mention) and relational (e.g. spreading rumors, affecting social relationships) (Bradshaw et al., 2014). Bullying consists of four types, namely emotionally, physically, verbally, and cyber (Budhi, 2016). Some acts of bullying that are often experienced by teenagers are physical and psychological/ emotional intimidation both directly and virtually through social media (cyberbullying) (Ipsos MORI, 2015).

Meanwhile, the risk factors that cause bullying according to the results of the study by Qian et al. (2020) include consuming alcohol, poor emotional management, having poor relationships with friends, lack of security, poor family relationships, parental neglect, and a punishing and persuasive parenting model. According to Budhi (2016) bullying in school children is usually caused by seeking attention from peers and parents, feeling important and feeling in control, and many are motivated by imitating the actions of adults or television programs.

Bullying if not handled immediately can have various negative impacts on individual health, not only physically but also

psychologically, and at worst it can lead to death (Budhi, 2016; Department for Education, 2017). In adolescents, the impact of bullying can continue into adulthood (Budhi, 2016). In many cases of bullying, although the perpetrator may also experience mental health problems, the victim may have more serious mental health problems (Bradshaw et al., 2014).

Research by Krusell et al. (2019) shows that adolescents who are victims of bullying (bullying) are more likely to have mental health problems that have a negative impact on daily life. The more often teens are bullied, the higher the risk of developing worse mental health problems. In addition, research by Ngo et al. (2021) also showed that school children who had experiences of being victims of bullying had a higher likelihood of developing depression. This needs to be considered because depression is a major risk factor for suicide in adolescents and the second to third cause of death and has caused worrying losses including social and educational disturbances as well as physical and mental health problems of adolescents in the future (Thapar et al., 2012).

Based on this background description, the researcher wants to conduct a study that discusses a comprehensive study of various primary studies on the effect of bullying on mental health and depression in adolescents. This study aims to assess the magnitude of the effect of bullying on mental health and depression based on the scores of several previous similar studies obtained globally using a meta-analysis.

## SUBJECTS AND METHOD

### 1. Study Design

The study design in this study was a systematic review and meta-analysis. The primary articles used in this study were obtained from online databases, including

PubMed, Google Scholar, ResearchGate, and Springer Link. The primary article search process in this study used the keywords “Bullying” AND “Mental Health Problem” OR “Psychological Disorder” OR “Psychological Distress” AND “Depression” OR “Depressive Disorder” AND “Adolescent” OR “Teenager”. From the total of all articles, the researcher filtered the articles that matched the researcher's criteria by using the PRISMA flow diagram.

## 2. Inclusion Criteria

The inclusion criteria of this study were full-text articles in English and using a cross-sectional study design, articles published in 2012-2022, there was an adjusted Odds Ratio (aOR) value with research results on mental health disorders and depression, and the research subjects were teenagers. In this case, the age range of adolescents follows the WHO limit, which is 10 to 19 years.

## 3. Exclusion Criteria

The exclusion criteria for this study were articles that were incomplete and not in English, research studies using cohort or case control studies, and articles published before 2012.

## 4. Definition Operational of Variable

The primary article search process in this study was based on criteria determined by the PICO model. Population: teenagers. Intervention: bullying. Comparison: not experiencing bullying. Outcomes: mental health, depression.

**Bullying** is defined as an act of intimidation in the form of physical, psychological, verbal, and cyber (internet) experienced by adolescents both at school and outside of school. The instrument used in the form of a questionnaire with bullying incidents reported by the victims themselves, the data scale is categorical.

**Mental health** is defined as an emotional, personality, and intellectual condition in

adolescents that can function optimally. The instruments used were different in the primary article, including the SDQ (Strengths and Difficulties Questionnaire), K10 (Kessler Psychological Distress Scale), as well as a questionnaire developed by the researcher himself. The mental health variable data scale is categorical.

**Depression** is defined as an adolescent condition that is usually characterized by deep sadness, feelings of worthlessness and guilt, withdrawal from others, sleeplessness, loss of appetite and interest and pleasure in usual activities. The instruments used in the primary articles are different, such as DASS-21 (Depression, Anxiety, and Stress Scale-21), CDI (Children's Depression Inventory), PHQ-9 (Patient Health Questionnaire), CES-DC (Center for Epidemiological Studies) -Depression Scale for Children), and a questionnaire developed by the researcher himself. Depression variable data scale is categorical.

## 5. Study Instruments

Research is guided by the PRISMA flow diagram and quality assessment using the Center for Evidence-Based Medicine (CEBMA, 2014).

## 6. Data Analysis

Analysis of the data in this study using the application Review Manager 5.3 (RevMan 5.3). Research data is presented in the form of narratives, forest plots, and funnel plots to determine the size of the relationship and heterogeneity of the data. The results of the analysis included in this study used a random effect model.

## RESULTS

Search for primary articles in this study through databases, including PubMed, Google Scholar, ResearchGate, and Springer Link. The process of screening articles according to the research criteria can be seen in the prism flow diagram (figure 1).

The initial search process obtained 3,065 articles, then after the screening process 120 articles were obtained which were considered as the primary articles of this study. The final result of the article screening process obtained 13 articles used in this study, including 5 articles related to the effect of bullying on adolescent mental health, 6 articles related to the effect of bullying on depression in adolescents, and 2 articles discussing the effect of bullying on mental health and depression in adolescents.

The study quality assessment was carried out quantitatively, which in this study used a study quality assessment for a cross-sectional design based on the Center for Evidence-Based Management (CEBMA) in 2014. The results of the study quality assessment based on the CEBMA can be seen in table 1. Meanwhile, table 2 contains a brief description of 7 articles related to the effect of bullying on the mental health of adolescents in various countries. While table 3 contains brief descriptions of 8 articles that discuss the effect of bullying on depression in adolescents from various countries.

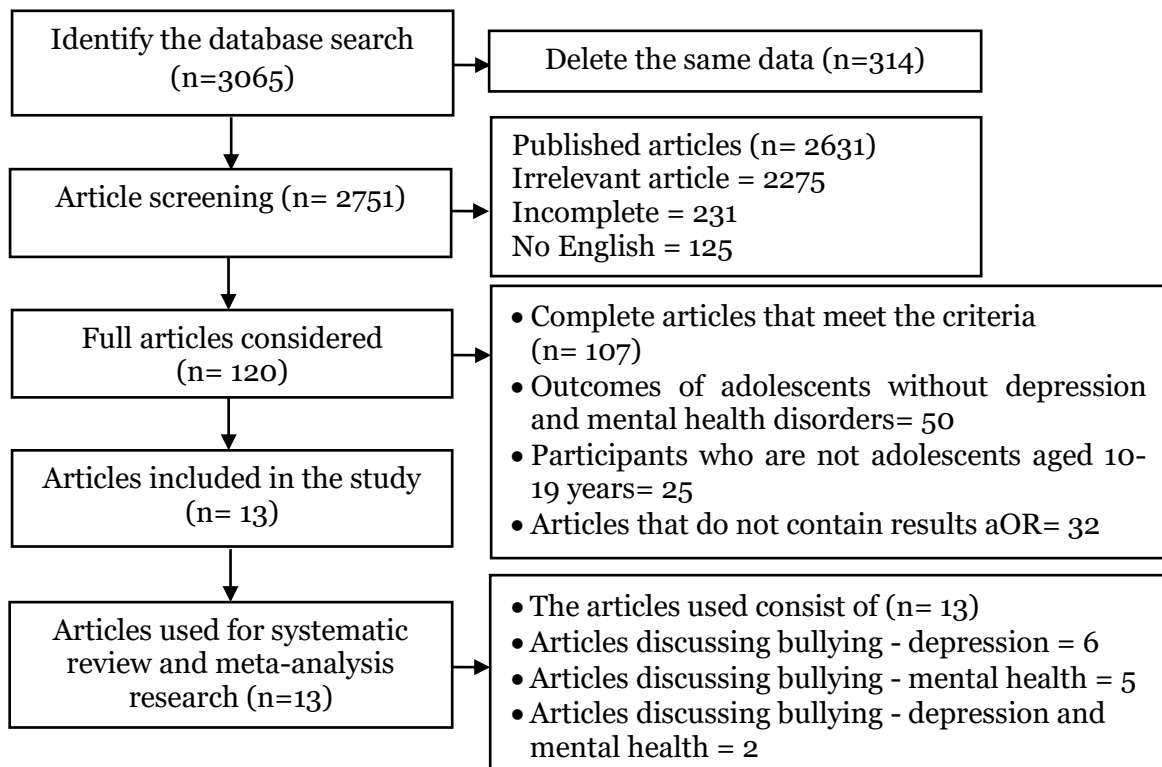
Based on the results of the analysis on the forest plot figure 3, it can be seen that from the 7 articles listed, there is a report on the effect of bullying on mental health disorders in adolescents. The results of the meta-analysis in this study were heterogeneous ( $I^2 = 97\%$ ), so that the data analysis used in the forest plot was a random effect model. The results of the forest plot show that the experience of bullying can increase the occurrence of mental health disorders

in adolescents by 2.48 times higher than adolescents who do not experience bullying and statistically significant (aOR= 2.48; 95%CI= 1.64 to 3.74;  $p < 0.001$ ).

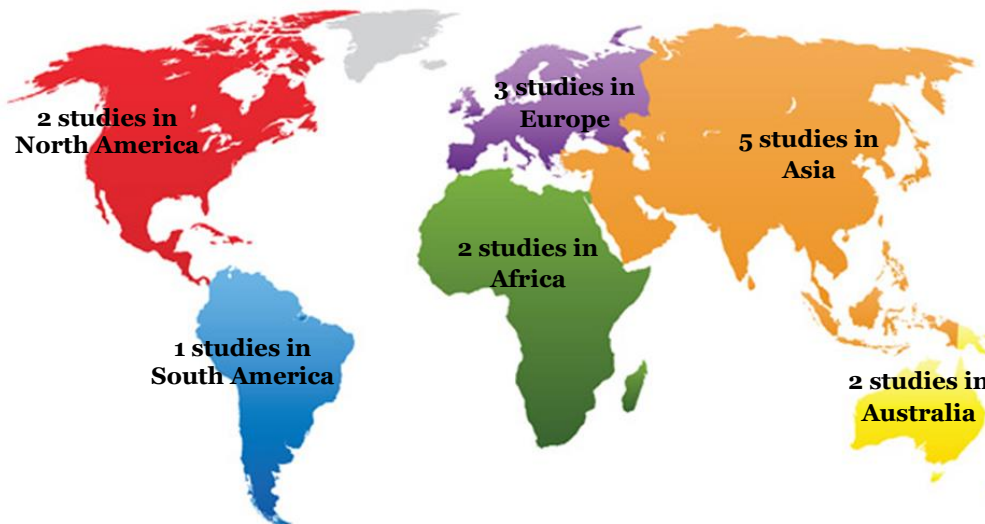
The results of the funnel plot analysis in Figure 4 show that the plot on the right is not symmetrical with the plot on the left. There are three plots on the right and four plots on the left. The plot on the right has a standard error (SE) between 0 and 0.2. While the plot on the left has a standard error (SE) between 0 and 0.3. This indicates that there is a publication bias in this study.

Based on the results of the forest plot figure 5, it can be seen that from the 8 articles listed, there is a report on the effect of bullying on the incidence of depression in adolescents. The results of the meta-analysis in this study were heterogeneous ( $I^2 = 87\%$ ), so the data analysis used in the forest plot was a random effect model. The results of the forest plot show that the experience of bullying can increase the incidence of depression in adolescents by 2.74 times higher than adolescents who do not experience bullying (aOR= 2.74; 95%CI= 2.29 to 3.28;  $p < 0.001$ ).

The results of the funnel plot analysis which can be seen in Figure 6 show that there is a publication bias which is indicated by the asymmetric distribution between the right and left plots. There are two plots on the right, three plots on the left, and three other plots that touch the vertical line. The plot on the right has a standard error (SE) between 0 and 0.8. While the plot on the left has a standard error (SE) between 0 and 0.4.



**Figure 1 PRISMA Flowchart**



**Figure 2. Map of Study Area**

**Table 1. Assessment of study quality based on Center for Evidence-Based Management (CEBMA)**

No.	Indicator	Publication (Author and Year)					
		AlBuhairan et al. (2017)	Schneider et al. (2012)	Wang et al. (2019)	Donato et al. (2021)	Liu et al. (2020)	Pengpid and Peltzer (2020)
1	Does the study address clearly focused questions/problems?	2	2	2	2	2	2
2	Is the research method (study design) appropriate to answer the research question?	2	2	2	2	2	2
3	Is the subject selection method clearly described?	2	2	2	2	2	2
4	Can the manner in which the sample is obtained cause selection bias?	2	2	2	2	2	2
5	Is the sample of subjects representative of the study population?	2	2	2	2	2	2
6	Was the sample size based on pre-study considerations of statistical power?	2	2	2	2	2	2
7	Was the response satisfaction level achieved?	2	2	2	2	2	2
8	Is the measurement (questionnaire) possible to be valid and reliable?	2	2	2	2	2	2
9	Was statistical significance assessed?	2	2	2	2	2	2
10	Is there a confidence interval for the main outcome?	2	2	2	2	2	2
11	Could there be confounding factors that have not been taken into account?	2	2	2	2	2	2
12	Can the research results be applied to your organization?	2	2	2	2	2	2
<b>Total</b>		<b>24</b>	<b>24</b>	<b>24</b>	<b>24</b>	<b>24</b>	<b>24</b>

**Note: 2= Yes; 1= Can't tell; 0= No**

**Table 2. Cont.**

No.	Indicator	Publication (Author and Year)						
		da Silva et al. (2020)	Kallmen and Hallgren (2021)	Romano et al. (2019)	Thomas et al. (2017)	Islam et al. (2020)	Gebremedhin et al. (2020)	Razak et al. (2019)
1	Does the study address clearly focused questions/problems?	2	2	2	2	2	2	2
2	Is the research method (study design) appropriate to answer the research question?	2	2	2	2	2	2	2
3	Is the subject selection method clearly described?	2	2	2	2	2	2	2
4	Can the manner in which the sample is obtained cause selection bias?	2	2	2	2	2	2	2
5	Is the sample of subjects representative of the study population?	2	2	2	2	2	2	2
6	Was the sample size based on pre-study considerations of statistical power?	2	2	2	2	2	2	2
7	Was the response satisfaction level achieved?	2	2	2	2	2	2	2
8	Is the questionnaire valid and reliable?	2	2	2	2	2	2	2
9	Was statistical significance assessed?	2	2	2	2	2	2	2
10	Is there a confidence interval for the main outcome?	2	2	2	2	2	2	2
11	Could there be confounding factors that have not been taken into account?	2	2	2	2	2	2	2
12	Can the research results be applied to your organization?	2	2	2	2	2	2	2
<b>Total</b>		<b>24</b>	<b>24</b>	<b>24</b>	<b>24</b>	<b>24</b>	<b>24</b>	<b>24</b>

**Note: 2= Yes; 1= Can't tell; 0= No**

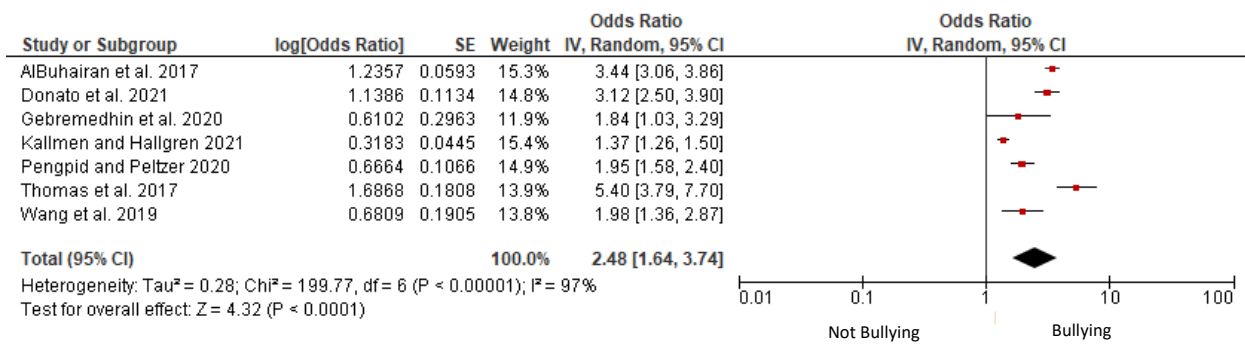
**Table 3. Description of primary research related to the effect of bullying on adolescent mental health**

Author (Year)	Country	Sample	Population	Intervention	Comparison	Outcome	aOR (95%CI)
AlBuhairan et al. (2017)	Saudi Arabia	9073	Adolescents in grades 7-12, mean age 15.80 years (SD=1.84)	Experienced bullying	Not experiencing bullying	Mental health disorders	3.44 (3.06 to 3.86)
Wang et al. (2019)	Taiwan	2028	Teenagers grade 10-11	Experienced bullying	Not experiencing bullying	Mental health disorders	1.98 (1.36 to 2.87)
Donato et al. (2021)	Italy	3002	10th graders, 15-16 years old	Experienced bullying	Not experiencing bullying	Mental health disorders	3.10 (2.50 to 3.90)
Pengpid and Peltzer (2021)	Morocco	6745	School youth, median age 15 years	Experienced bullying	Not experiencing bullying	Mental health disorders	1.95 (1.58 to 2.40)
Kallmen dan Hallgren (2021)	Sweden	32722	Teenagers in grades 9 and 11, ages 15-18 in 2014, 2018, and 2020	Experienced bullying	Not experiencing bullying	Mental health disorders	1.38 (1.26 to 1.50)
Thomas et al. (2017)	Australia	2967	Teenagers aged 11-17 years, average age 14.6 years	Experienced bullying	Not experiencing bullying	Mental health disorders	5.40 (3.79 to 7.70)
Gebremedhin et al. (2020)	Ethiopia	782	Teenagers in grades 9-12, 15-19 years old	Experienced bullying	Not experiencing bullying	Mental health disorders	1.82 (1.03 to 3.29)

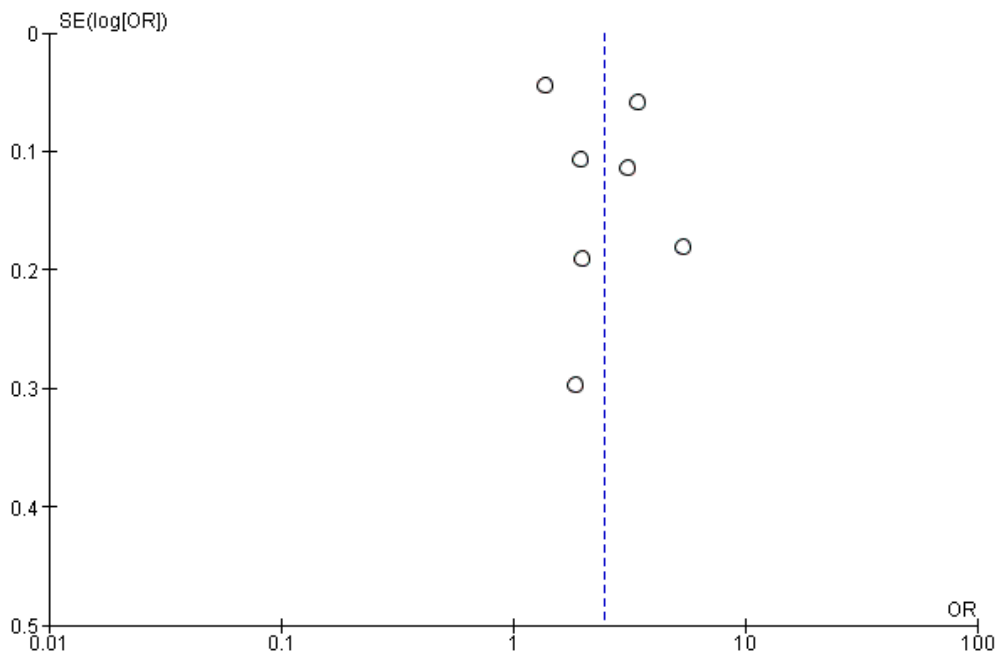


**Table 4. Description of primary research related to the effect of bullying on depression in adolescents**

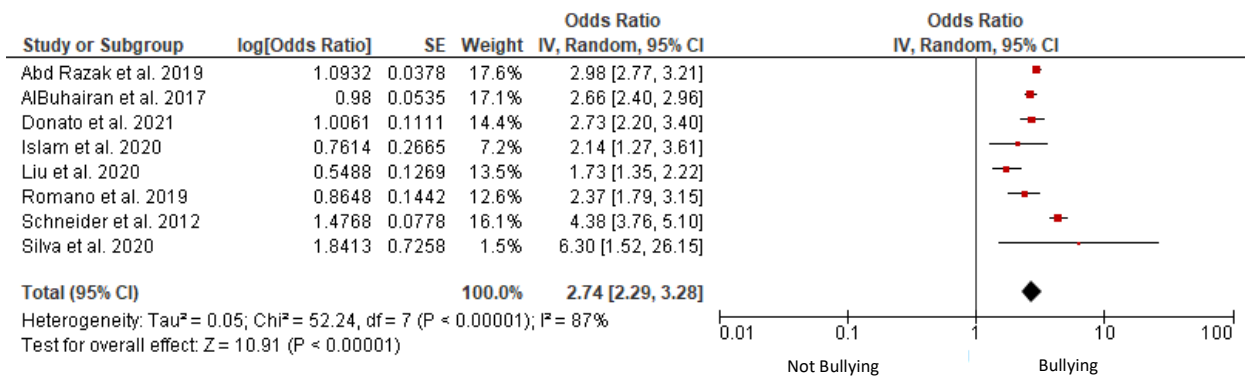
<b>Author (Year)</b>	<b>Country</b>	<b>Sample</b>	<b>Population</b>	<b>Intervention</b>	<b>Comparison</b>	<b>Outcome</b>	<b>aOR (95% CI)</b>
AlBuhairan et al. (2017)	Saudi Arabia	9073	Adolescents in grades 7-12, mean of age was 15 years (Mean= 15.80; SD= 1.84)	Experienced bullying	Not experiencing bullying	Depression	2.66 (2.39 to 2.95)
Schneider et al. (2012)	Massachusetts, United States	20406	Teenagers grade 9-12	Experienced bullying	Not experiencing bullying	Depression	4.38 (3.76 to 5.10)
Donato et al. (2021)	Italia	3002	10th graders, 15-16 years old	Experienced bullying	Not experiencing bullying	Depression	2.70 (2.20 to 3.40)
Liu et al. (2020)	China	5926	Teenagers in grades 7-12 who have at least 1 brother/sister who live in the same house, age 10-18 years old	Experienced bullying	Not experiencing bullying	Depression	1.73 (1.35 to 2.22)
da Silva et al. (2020)	Brazil	408	6th grader, median age 11.3 years	Experienced bullying	Not experiencing bullying	Depression	6.31 (1.52 to 26.15)
Romano et al. (2020)	Canada	6585	Teenagers grade 9-12	Experienced bullying	Not experiencing bullying	Depression	2.37 (1.79 to 3.15)
Islam et al. (2020)	Australia	2166	Teenagers in grades 7-12, ages 12-17	Experienced bullying	Not experiencing bullying	Depression	2.14 (1.27 to 3.61)
Abd Razak et al. (2019)	Malaysia	4783	Teenagers 13-17 years old	Experienced bullying	Not experiencing bullying	Depression	2.80 (2.77 to 3.21)



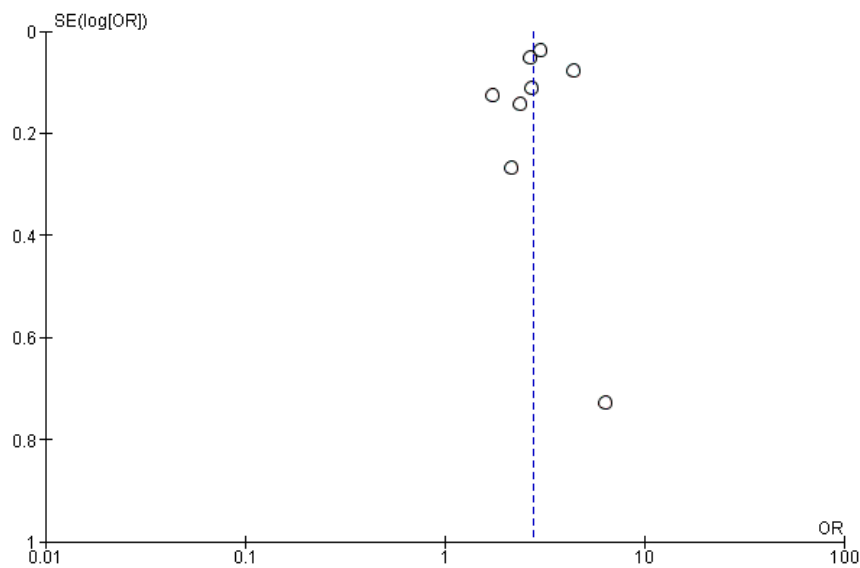
**Figure 3. Forest plot of the effect of bullying on mental health**



**Figure 4. Funnel plot of the effect of bullying on mental health**



**Figure 5. Forest plot of the effect of bullying on depression**



**Figure 6. Funnel plot of the effect of bullying on depression**

## DISCUSSION

This systematic review and meta-analysis discusses the topic of the effect of bullying on mental health and depression in adolescents aged 10-19 years. The independent variable in this study is the experience of bullying experienced by adolescents both in the school environment and outside of school. While the outcome that became the dependent variable in this study was mental health and depression in adolescent victims of bullying. The primary research results used in the analysis in this study were sourced from various countries and had a large sample size. This can lead to increased heterogeneity of the results of this study.

### 1. The effect of bullying on mental health

The primary studies used in this meta-analysis were 7 articles from Saudi Arabia, Taiwan, Italy, Morocco, Sweden, Australia, and Ethiopia with a cross-sectional study design. The results of the meta-analysis in this study showed a significant effect, namely the experience of bullying can increase the occurrence of mental health disorders in adolescents by 2.48 times higher than adolescents who did not

experience bullying (aOR= 2.48; 95%CI= 1.64 to 3.74;  $p < 0.001$ ).

According to Tsitsika et al. (2014) bullying in school-age children is a universal problem that continues to be a serious problem and a threat to the physical and emotional health of children and adolescents. Research by Al-Zawaadi et al. (2021) showed that the most cases of bullying in adolescents occurred at school (65.8%), followed by elsewhere (22.8%), and at home (11.4%).

The results of the study of Stewart-Tufescu et al. (2021) show that the experience of bullying can cause mental health disorders in both boys and girls, and the more often someone experiences bullying, the higher the risk for mental health disorders. As with the research of Annerback et al. (2014) which shows that the effect of bullying on adolescent girls' mental health problems increases when the frequency of bullying increases, namely bullying that is carried out once or more a week (aOR= 4.79; 95%CI= 2.07 to 11.06) has a higher potential to cause mental health problems. compared to bullying that was carried out

less than once a week (aOR= 2.98; 95%CI= 2.05 to 4.33).

According to research Politis et al. (2014) there is a positive association between victims of bullying and the experience of suffering from health problems in victims, including mental health problems. Research Callaghan et al. (2019) also shows that the experience of bullying in adolescents can increase the risk for experiencing mental health problems as much as 1.382 times greater than adolescents who have never been victims of bullying (95%CI= 1.16 to 1.65). In addition, victims of bullying are at risk of experiencing health problems not only psychological, but also physiological (Arslan et al., 2012).

Efforts that can be made to deal with mental health problems due to bullying in adolescents can be done by empowering families to improve psychological pressure that can threaten children's mental health, reducing the possibility of bullying by peers at school, and providing health education programs for adolescents (Lee et al., 2019). Vigilance regarding bullying behavior in adolescents is needed both at home and at school to prevent the negative impact of bullying that can harm adolescents both in terms of physical, mental, social well-being, as well as in terms of youth academics at school (Arslan et al., 2012).

## **2. The effect of bullying on depression**

This meta-analysis uses 8 primary studies sourced from Saudi Arabia, US, Italy, China, Brazil, Canada, Australia, and Malaysia with a cross-sectional study design. The results of the meta-analysis showed a significant effect, namely the experience of bullying can increase the incidence of depression in adolescents by 2.74 times higher than adolescents who did not experience bullying (aOR= 2.74; 95%CI= 2.29 to 3.28;  $p < 0.001$ ).

Depression is a major health problem that is most often found in adolescent victims of bullying (Tsitsika et al., 2014). Research by Ngo et al. (2021) showed that all types of bullying in adolescents had a statistically significant relationship with the incidence of depression, including physical bullying ( $p < 0.01$ ), verbal bullying ( $p < 0.01$ ), and sexual bullying ( $p = 0.01$ ). In addition, the study by Eyuboglu et al. (2021) also showed a significant relationship between cyberbullying and depression in adolescents ( $p < 0.001$ ). According to the research of Williams et al. (2017) of all teenagers who are victims of bullying, 42% of them experience depression.

The research results of Hansson et al. (2020) showed that the experience of being a victim of bullying in adolescents can increase the risk for depression by 3.84 times greater than adolescents who have never been victims of bullying (95%CI= 3.13 to 4.71). Similarly, the research of Tran et al. (2020) which showed that the experience of bullying in adolescents can increase the likelihood of adolescents experiencing various depressive symptoms (OR= 1.30; 95%CI= 1.10 to 1.50), and women have a higher likelihood of experiencing depression than men. In addition, the research of Wilson et al. (2012) also showed that the experience of bullying has the potential to increase the incidence of depression in adolescents by 1.63 times (95% CI = 1.27 to 2.09).

School adolescents who report being victims of bullying are, on average, twice as likely to experience depression, so that the more cases of bullying that occur in schools, the more symptoms of depression students can experience (Williams et al., 2017). Adults who work with children, such as teachers, social workers, medical personnel, or others, should focus not only on the form of bullying experienced by children and

efforts to overcome bullying behavior, but also its internal consequences for children such as symptoms depression and overall child health problems (Hansson et al., 2020).

This study has limitations, including publication bias, and the primary article sources used in this meta-analysis were only obtained from 4 databases, namely PubMed, Google Scholar, ResearchGate, and Springer Link.

#### **AUTHORS CONTRIBUTION**

Nurusyifa Afiana Zaen and Riya Ulin Nuha were the main researchers, contributing to topic determination, primary article search and collection, data processing and analysis, and research manuscript writing. Nindita Arum Veibiani acts as research assistant.

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#### **CONFLICT OF INTEREST**

There was no conflict of interest in this study.

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