TPM Vol. 32, No. 4, 2025
ISSN: 1972-6325
https://www.tpmap.org/

CYBERBULLYING EXPOSURE AND PSYCHOLOGICAL INFLUENCE ON ADOLESCENTS: A INDICATORS MENTAL HEALTH ANALYSIS IN MAKASSAR, INDONESIA

PUTRI MELINDA SUNUSI
STUDENT IN THE COMMUNICATION STUDIES PROGRAMME, HASANUDDIN UNIVERSITY, INDONESIA

MULIADI MAU
DEPARTMENT MEDIA AND COMMUNICATION HASANUDDIN UNIVERSITY, INDONESIA

MUH. IQBAL SULTAN
DEPARTMENT MEDIA AND COMMUNICATION, HASANUDDIN UNIVERSITY, INDONESIA.

Abstract
Introduction: This study investigates the impact of cyberbullying exposure on five mental health indicators that depression, anxiety, decreased energy, cognitive impairment, and somatic symptoms among adolescents in Makassar City. Using a descriptive quantitative design, 400 junior high school students completed a Likert-based survey examining exposure frequency and psychological symptoms. Results show that negative comments and sarcastic posts are the dominant cyberbullying forms, while anxiety and decreased energy emerge as the most prevalent mental health symptoms. Cross-regional comparison indicates higher vulnerability in denser urban areas. Correlation analysis reveals significant positive associations between cyberbullying exposure and all symptom indicators mental health, while simple linear regression explains 8.6% of mental health variance. Findings align with Klapper's Exposure Media Theory and Stress–Coping Theory, demonstrating that repeated exposure functions as a cumulative psychological stressor within a visual-digital ecosystem. The study underscores the need for digital literacy, early detection systems, and school-based psychosocial support.
Keywords: Cyberbullying Exposure; Mental Health; Adolescents; Instagram; Makassar.

I. INTRODUCTION

The development of the global digital ecosystem over the past decade has changed the communication patterns of the younger generation and created a new environment fraught with risks, including the increasing prevalence of cyberbullying, which has now become a significant public health issue [1], [2], [3]. Social media facilitates the rapid and widespread dissemination of negative messages, thereby amplifying the psychological impact experienced by victims. Instagram, which is widely used by teenagers, has become one of the platforms most vulnerable to forms of digital bullying such as aggressive comments, sarcastic posts, negative tagging, and the unauthorised dissemination of personal content [4], [5]. This phenomenon shows that digital media is not only a space for expression but also an arena for intense social conflict. The negative impact of cyberbullying is increasingly evident in the mental health of teenagers. Various studies show that exposure to digital aggression correlates with increased anxiety, depression, loneliness, emotional distress, and insecurity [6], [7], [8]. In addition, long-term consequences such as decreased self-esteem, behavioural disorders, somatic disorders, and even thoughts of self-harm have become a global concern [9], [10].

Other studies also confirm that the cumulative effects of cyberbullying include psychological fatigue, cognitive impairment, and decreased energy, which impact adolescents' academic performance and social functioning [11], [12]. The growth of research in the field of digital analytics shows that cyberbullying can now be analysed through automatic detection technology based on machine learning, deep learning, and linguistic analysis [13], [14], [15], [16]. This research maps patterns of aggressive language, forms of hate speech, and characteristics of violent messages circulating on social media. In Indonesia, research on the identification of negative comments, offensive content, and public sentiment on digital platforms shows that adolescent users are the group most vulnerable to risk [17], [18], [19]. These findings emphasise that the digital environment they face is far more complex than that of previous generations.

In addition to detecting digital aggression, international and national research shows consistent patterns regarding the psychosocial impact of cyberbullying. Various studies have found that victims of cyberbullying often experience more severe emotional distress than victims of traditional bullying, due to the permanent, widespread, and uncontrollable nature of the internet [20], [21]. Other studies also confirm that exposure to cyberbullying not only affects short-term mental health but also has the potential to affect the quality of social relationships, character development, and social adaptation skills in adolescents [22], [23]. Therefore,

cyberbullying is a multidimensional phenomenon that is interrelated with psychological, social, and technological aspects.

In Indonesia, the rapid increase in social media users has not only expanded opportunities for digital expression but also increased the risk of adolescents being exposed to online bullying [24], [25]. However, most national studies still focus on the general population or upper secondary school students, while specific studies on lower secondary school adolescents who are very active on visual platforms such as Instagram are still rare. Findings from cross-national studies also show that higher social media access among adolescents is closely related to a vulnerable adolescence in terms of risk-taking, unstable emotions and the emergence of mental health conditions such as depression [6], [26], [27].

In a geographical context, the city of Makassar is a relevant area for research because it has unique social, demographic and digital characteristics. As an economic and educational centre in Eastern Indonesia, Makassar has a dense urban life, high mobility and intensive exposure to social media among teenagers. The diversity of this region, ranging from the west, which is bustling with commercial activity, to the north, which is densely populated, to the east, which is rapidly developing, to the south, which is filled with educational facilities, forms a social ecosystem that facilitates active and diverse digital interactions among adolescents [28] . The northern and western regions of Makassar are more developed and densely populated urban areas, dominated by the Bugis community, which has high economic and social activity. The southern region tends to be more suburban, dominated by the Makassar ethnic group and characterised by greater social homogeneity. Meanwhile, the eastern region is a developing area with more heterogeneous new settlements. The diversity of socio-cultural conditions and levels of urbanisation in these four regions has the potential to influence the intensity of digital media use and patterns of cyberbullying among adolescents.

Although existing research has provided an in-depth understanding of cyberbullying, there are still several research gaps that need to be explored further. First, studies that specifically examine the impact of cyberbullying on the mental health of adolescent Instagram users are still limited. Second, measurements of psychological impact often focus only on anxiety and depression, even though empirical evidence shows other effects such as decreased energy, cognitive impairment, and somatic disorders [29], [30]. Third, research on the dynamics of cyberbullying among adolescents in Makassar City is still minimal, even though this region has socio-digital characteristics that differ from other regions in Indonesia. Given these three gaps, this study offers a perspective by integrating multidimensional psychometric analysis to map the impact of cyberbullying on five indicators of adolescent mental health: depression, anxiety, decreased energy, cognitive impairment, and somatic disorders. Furthermore, this study focuses specifically on the Instagram platform among adolescents in Makassar City, thereby producing empirical findings that have not been discussed in previous studies. By centring the analysis on the highly digitalised context of Eastern Indonesia, this study enriches the literature on the geography of cyberbullying risk in Indonesia.

Therefore, this study aims to (1) describe the level of mental health among adolescents in Makassar, and (2) analyse the relationship between exposure to cyberbullying and mental health. The practical contribution of this study is to provide a basis for schools in designing digital literacy interventions that emphasise attention management and strengthen supportive communication between peers and teachers, in line with the social character of Makassar as a dynamic metropolis.

II. RESEARCH METHODOLOGY

2.1 Type and Design of Research

This study uses a quantitative approach with descriptive methods to provide a clear picture of the impact of cyberbullying on Instagram on the mental health of adolescents in the city of Makassar. A quantitative approach was chosen because the main objective of this study is to measure the prevalence and level of exposure to cyberbullying and its impact on the mental health of adolescents using five mental health indicators. The descriptive method allows researchers to collect and present data systematically without testing causality. In this study, the collected data will be analysed statistically to provide an overview of the level of exposure to cyberbullying and how it affects the mental health of adolescents.

2.2 Unit of Analysis

The unit of analysis in this study is adolescents in Makassar City who actively use Instagram social media. The focus of this study is to describe the level of cyberbullying experienced by adolescents through Instagram and its impact on their mental health. Data will be collected to determine how often adolescents experience cyberbullying and how it correlates with psychological disorders. Mental health measurements refer to five indicators of neurotic disorders according to national basic health research, namely: depression, decreased energy, cognitive disorders, and somatic symptoms [31]. This study will divide the observed variables into two main categories: first, the dependent variable, namely adolescent mental health, and second, the independent variable, namely the exposure to cyberbullying experienced by adolescents. An analysis will be conducted to explore the relationship between these two variables in the geographical and social context of Makassar City.

2.3 Data Sources and Collection Techniques.

The main data source in this study is adolescents in Makassar City who actively use Instagram social media. The sampling technique used is cluster random sampling, which ensures that each region in Makassar,

namely the western, northern, eastern, and southern regions, is proportionally represented. From a population of 59,796 adolescents, 400 respondents were selected using the Slovin formula to obtain a representative sample with a margin of error of 5%. Data collection was conducted through the distribution of a Likert scale-based questionnaire that measured the frequency of cyberbullying exposure on adolescent mental health. The questionnaire consisted of two parts: the first part measured the level of exposure to cyberbullying, while the second part measured its impact on adolescent mental health. The Likert scale used five options (Very Often, Often, Rarely, Not Often, and Very Rarely) to facilitate data processing and statistical analysis.

2.4 Data Analysis Procedures

Data analysis will be performed using descriptive statistical techniques to describe the prevalence of cyberbullying and its relationship with adolescent mental health. Data obtained from the Likert scale will be analysed by calculating the average score for each variable. The score range for the dependent variable (mental health) is divided into three categories: low (6–13), moderate (14–21), and high (22–30); while for the independent variable (cyberbullying exposure), the score range is divided into three categories: low (10–23), moderate (24–37), and high (38–50). This categorisation is used to interpret the extent to which adolescents experience cyberbullying exposure and mental health disorders. The results of this descriptive analysis will provide a clear picture of the level of cyberbullying exposure and its impact on the psychological condition of adolescents in Makassar.

III. FINDINGS RESEARCH

3.1 Participant Characteristics

This section begins with a presentation of the characteristics of the respondents involved in the study. A total of 400 adolescents participated in this study, consisting of junior high school students in Makassar City.

Table 1. Demographic Characteristics of Participants (N = 400)

Variable	Category	Frequency (F)	Percentage (%)
Gender	Male	182	45.5
	Female	281	54.5
Region	West	120	30.0
	South	96	24.0
	East	82	20.5
	North	102	25.5

The sample for this study consisted of 400 adolescents in Makassar City. The majority of participants were female (54.5%), while males accounted for 45.5% of the total respondents. In terms of regional distribution, most respondents came from the western region (30.0%), followed by the northern region (25.5%) and the southern region (24.0%), while the eastern region recorded the lowest figure at 20.5%.

3.2 Dominant Cyberbullying Forms

This analysis aims to describe the types of cyberbullying most commonly experienced by adolescents in Makassar City. posts/content, bullying through direct messages, negative tags, and the dissemination of photos without permission. The following is a complete distribution based on the types of cyberbullying experienced by respondents. The following table presents data on the frequency and percentage of each category.

Table 2. Dominant Cyberbullying Forms Experienced by Students

	Category	Frequency (F)	Percentage (%)
Dominant Cyberbullying Forms	Negative Comments	139	34.8
	Sarcastic Posts/Content	87	21.8
	Bullying Direct Messages	67	16.8
	Negative Tags/Mentions	59	14.8
	Dissemination of photos/videos without permission	48	12.0

Table 2 shows the distribution of the most dominant types of cyberbullying experienced by adolescents in Makassar City. Of the total 400 respondents, most adolescents experienced negative comments (34.8%), indicating that verbal abuse is the most common type of cyberbullying. Additionally, 87 adolescents (21.8%) reported being exposed to sarcastic posts or content, which is also a significant type of bullying. Bullying through direct messages was experienced by 67 adolescents (16.8%), while 59 adolescents (14.8%) experienced negative tags or mentions. Finally, 48 adolescents (12.0%) experienced the distribution of photos or videos without permission.

Overall, the distribution in this table shows that cyberbullying among adolescents in Makassar City is dominated by verbal and public forms, such as negative comments and sarcastic posts, which often affect the emotional and social well-being of adolescents. More personal forms, such as bullying through direct messages and the unauthorised distribution of photos/videos, although less common, have a more profound impact on individual privacy and emotional security.

3.3 Levels of Mental Health

To obtain an overview of the mental health conditions of adolescents in Makassar City, this study categorised mental health levels based on the total scores of five main indicators, namely depression, anxiety, decreased energy, cognitive impairment, and somatic symptoms. The categories used consisted of low, moderate, and high levels, allowing for a more structured identification of variations in adolescents' mental conditions. The complete distribution of mental health categories is shown in the following table.

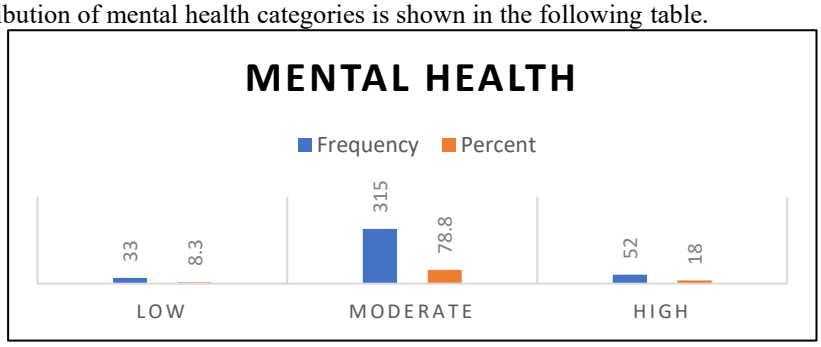

Figure 1. Distribution of Mental Health Levels

Figure 1 shows the distribution of mental health levels among junior high school students in Makassar City. Of the total 400 respondents, most students were in the moderate category, namely 315 people (78.8%). These findings indicate that most students experience moderate psychological symptoms, reflecting significant emotional and cognitive pressures in their daily lives. In addition, there were 52 students (18%) in the high category, indicating that some of them experience more serious mental health disorders, which could have a significant impact on their academic and social functioning. Meanwhile, only 33 students (8.3%) were in the low category, indicating that the proportion of respondents who were in a stable psychological condition was relatively small.

Overall, this distribution shows that students' mental health tends to be at a moderate to high level. This confirms the need for greater attention to the mental health of adolescents, especially through school-based interventions to detect and treat symptoms early.

3.4 Differences Mental Health Levels of Adolescents between Male and Female

The following section presents an analysis of differences in mental health levels based on gender. These differences are important because male and female adolescents often show different emotional and psychological responses to daily stressors and digital exposure. By comparing the distribution of mental conditions in both groups, this study provides a clearer picture of patterns of psychological vulnerability and strength in adolescents. The following table shows differences in mental health levels based on gender.

Table 3. Differences Mental Health Levels between Male and Female

No	Gender	Mental Health			Total
		Low	Moderate	High	
1	Male	18	133	31	182
		9,9%	73,1%	9,6%	100%
2	Female	15	182	21	218
		6,9%	83,5%	17,0%	100%
Total		33	315	52	400
		8,3%	13,0%	78,8%	100%

Table 3 shows the distribution of mental health levels based on gender. Of the total 182 male students, 18 students (9.9%) were in the low category, 133 students (73.1%) were in the moderate category, and 31 students (17.0%) were in the high category. Meanwhile, of the 218 female students, 15 students (6.9%) were in the low category, 182 students (83.5%) were in the moderate category, and 21 students (9.6%) were in the high category. These data show that both males and females are dominated by the moderate mental health category, but females have a higher proportion of the high category than males. These differences can be attributed to gender tendencies in expressing psychological pressure and managing emotional responses. Female adolescents are often more emotionally expressive, while males tend to suppress or hide stress due to masculinity norms that emphasise assertiveness and self-control [32].

3.5 Differences Mental Health Levels of Adolescents Based Regions in Makassar City

This analysis aims to describe the distribution of mental health conditions among adolescents in Makassar City based on their geographical location. Respondents were divided into several regions, namely west, south, east, and north. This study aims to identify differences in mental health levels among adolescents from

different regions. The following figure shows the distribution of mental health levels among adolescents by region.

Table 4. Differences Mental Health Levels between Based Regions

No	Based Regions	Mental Health			Total
		Low	Moderate	High	
1	West	13	89	18	12
		10,8%	74,2%	15,0%	100%
2	South	5	79	12	96
		5,2%	82,3%	12,5%	100%
3	East	11	63	8	82
		13,4%	76,8%	9,8%	100%
4	North	4	84	14	102
		3,9%	82,4%	13,7%	100%
Total		33	315	52	400
		8,3%	78,8%	13,0%	100%

Table 4 shows the distribution of mental health levels among students based on their residential areas in Makassar City. In the western region, most students were in the moderate category (74.2%), with 10.8% in the low category and 15.0% in the high category. The southern region was also dominated by the moderate category (82.3%), followed by 12.5% in the high category and only 5.2% in the low category. In the eastern region, 76.8% of students were in the moderate category, 13.4% in the low category, and 9.8% in the high category. Meanwhile, the northern region had the highest proportion of students in the moderate category (82.4%), with 13.7% in the high category and 3.9% in the low category.

Overall, the majority of adolescents in all regions are in the moderate mental health category, with slight differences between regions in the distribution of the high and low categories. However, the western and northern regions show a higher proportion in the moderate category, while the eastern and southern regions have slightly more in the high category.

3.6 Mental Health Indicators

To provide a clearer picture of the mental health conditions of adolescents in Makassar City, this analysis was conducted using various mental health indicators. These indicators include symptoms of depression, anxiety, decreased energy, cognitive impairment, and somatic disorders that affect adolescent mental health. Each indicator provides insight into specific aspects of adolescent mental health, allowing for a deeper understanding of the psychological challenges they face. The table below shows the distribution of mental health indicators measured in respondents.

Table 5. Mental Health Scores (Descriptive Statistics)

Indicator	Mean	SD
Depression	6.38	1.566
Anxiety	6.63	1.697
Decreased Energy	6.54	1.587
Cognitive Disorders	6.10	1.525
Somatic Disorders	5.76	1.546

The table above shows the mean and standard deviation of various mental health indicators among adolescents in Makassar City. The mean scores for depression, and decreased energy are in the moderate range, with anxiety showing the highest value. Cognitive and somatic disorders are also at moderate levels, but with less variation. Overall, these data indicate a fairly high level of mental health problems with variation among adolescents.

Overall, the average values for all indicators show a moderate level of mental health problems among adolescents, with significant variation between individuals, indicating that mental health management needs to be tailored to the specific needs of each adolescent.

3.7 Correlation Between Cyberbullying Exposure and Mental Health

As a step towards understanding the relationship between exposure to cyberbullying and mental health, this analysis aims to explore the extent to which such exposure affects adolescents' mental health. This study measures various aspects of mental health, such as anxiety, depression, and decreased energy, cognitive and somatic disorders, to assess the correlation with the level of cyberbullying exposure experienced by adolescents. The table below shows the results of the analysis of the relationship between the two variables.

Table 6. Correlation Matrix

Variabel	CB Exposure	Depresi	Kesemasan	Penuruna Energi	Gangguan Kognitif	Gangguan Somatik
Cyberbullying Exposure	1.00	r=0.249	r=0.227	r=0.233	r=0.165	r=0.258

The table above shows the correlation between exposure to cyberbullying and various mental health indicators among adolescents in Makassar City. From the analysis results, it was found that exposure to cyberbullying has a positive correlation with all mental health indicators measured, albeit with varying degrees of strength. The correlation with depression (r=0.249) shows a moderate relationship, meaning that the higher the exposure to cyberbullying, the greater the depression experienced by adolescents. The same applies to anxiety (r=0.227) and decreased energy (r=0.233), where the higher the exposure, the greater the level of anxiety and fatigue felt by adolescents. Meanwhile, the correlation with cognitive impairment (r=0.165) is lower, but still shows a positive relationship, indicating the impact of cyberbullying exposure on thinking or concentration abilities. The highest correlation was found in somatic disorders (r=0.258), indicating that cyberbullying exposure is more closely related to physical or somatic disorders in adolescents. Overall, these results indicate that exposure to cyberbullying has a significant effect on various aspects of adolescent mental health.

3.8 Regression Linear Analysis

Regression analysis was conducted to identify the relationship between the level of exposure to cyberbullying and various mental health indicators. This approach allows us to measure the contribution of cyberbullying exposure to changes in adolescents' psychological conditions, as well as determine the extent to which it affects their overall mental health. The following table presents the results of a regression analysis that measures this influence.

Table 7. Linear Regression Predicting Mental Health from Cyberbullying Exposure

R	R Square	Adjusted R Square	Std. Error Of the Estimate
0.292	0.086	0.083	5.663

The table above shows the results of a regression analysis measuring the effect of cyberbullying exposure on adolescents' mental health. An R value of 0.292 indicates a low correlation between the two variables. An R Square value of 0.086 indicates that only 8.6% of the variation in adolescents' mental health can be explained by cyberbullying exposure. The slightly lower Adjusted R Square value (0.083) indicates that other factors may influence these results. The Standard Error of the Estimate value of 5.663 indicates a fairly large margin of error in the prediction. Overall, although exposure to cyberbullying has an impact, other factors also influence adolescents' mental health.

IV. DISCUSSION

The results of the study show that most adolescents experience digital aggression with a frequency sufficient to cause emotional distress, although not to an extreme degree in most cases. The most common type is negative comments (34.8%), followed by sarcastic posts (21.8%), bullying via direct messages (16.8%), negative tagging (14.8%), and the distribution of photos/videos without permission (12.0%). This pattern shows that digital aggression is more dominant in the eyes of many people. Given that Instagram is a visual platform based on comments, the high number of negative comments indicates that the area of social interaction among teenagers has become a competitive arena that is vulnerable to social judgement. In the context of Makassar as a large city with high social media usage, this exposure increases in line with widespread digital connectivity. Overall, this data proves that cyberbullying has become an inherent element in the digital lives of teenagers in Makassar.

Mental health analysis shows that 78.8% of teenagers are in the moderate category, 13.0% in the high category, and only a small portion in the low category. Five mental health indicators show average scores: anxiety (Mean = 6.63; SD = 1.697), depression (Mean = 6.38; SD = 1.566), decreased energy (Mean = 6.54; SD = 1.587), cognitive impairment (Mean = 6.10; SD = 1.525), and somatic impairment (Mean = 5.76; SD = 1.546). These values indicate consistent and interrelated patterns of disturbance. Anxiety is the most dominant indicator, suggesting that adolescents feel a strong social threat related to their digital activities. Decreased energy and cognitive impairment indicate emotional exhaustion and decreased executive function. Meanwhile, somatic disturbances indicate that emotional stress has transformed into physical responses. Therefore, these five indicators provide a comprehensive picture of the psychological impact experienced by students.

Klapper (1960) explicitly confirmed the assumption that media effects do not appear instantly, but are formed through a process of repeated and consistent exposure. This theory assumes that individuals are influenced by the media when they continuously see, read, or hear certain messages over a long period of time, so that these stimuli enter their cognitive and affective systems [33], [34], [35]. The results of the study show that

adolescents in Makassar experience cyberbullying through various forms of digital content, ranging from negative comments and sarcastic posts to direct messages that are often encountered every day on platforms such as Instagram. This pattern of repeated exposure is in line with Klapper's assumption that repeated exposure creates a cumulative effect, whereby negative messages are not only received once, but are noticed, interpreted, and ultimately internalised by individuals. The intensity of exposure also determines the strength of its impact in this context. The presence of aggressive messages that appear repeatedly through notifications, public comments, or interactions on timelines encourages adolescents to pay greater emotional attention to them. In line with this thinking, the mechanism of exposure accumulation seems to function when adolescents begin to view aggressive content as part of the social dynamics they must face every day. The findings of this study not only verify Klapper's theory but also place it in the context of the modern digital environment, where the active, fast-paced, and repetitive characteristics of social media accelerate the cumulative effect process described in exposure media theory.

Furthermore, in dialogue with the Stress and Adjustment Theory proposed by Lazarus and Folkman (1984), there is strong support for the assumption that psychological stress arises when individuals assess environmental demands to exceed their ability to cope with them [36], [37], [38], [39]. This theory assumes that stress responses are formed through two main processes, namely primary appraisal, which is an individual's initial assessment of whether an event is a threat, and secondary appraisal, which is an evaluation of an individual's ability to cope with it. Research findings show that adolescents exposed to cyberbullying experience various psychological disorders, such as anxiety, depression, decreased energy, cognitive impairment, and somatic symptoms, which reflect a failure of the adjustment process when digital bullying stimuli repeatedly appear in their online activities. When adolescents receive negative comments or sarcastic posts, they tend to perceive them as threats to their self-esteem and social relationships, which is a strong primary assessment process. If they do not have adequate coping strategies such as social support or stable emotional regulation, stress will develop into a greater emotional and physical burden. This is in line with the theoretical assumption that a lack of coping strategies causes maladaptive psychological reactions, which are expressed in the form of excessive anxiety, emotional exhaustion, and concentration disorders. Thus, the results of this study not only confirm the stress and coping theory but also contextualise it within the digital environment of adolescents in Makassar, where the rapid and repetitive flow of aggressive news limits the space for adaptive coping strategies and accelerates the transition from mild psychological pressure to more complex emotional disorders, as described by Lazarus and Folkman.

The integration between media exposure theory and stress and coping theory can be clearly observed in the statistical patterns of this study. Positive correlations on five mental health indicators show that adolescents experience significant difficulties in coping with these pressures. Despite the relatively small coefficient of determination ($R^2 = 0.086$), the regression model remains statistically significant. This is common in psychological and social research, as adolescent mental health is shaped by a variety of ecological, interpersonal, and individual factors. The small R^2 reflects the multidimensional nature of mental health, while statistical significance indicates that exposure to cyberbullying made a consistent and meaningful contribution across the sample. These findings support the interpretation that cyberbullying is a relevant psychological stressor, although not a dominant determinant of mental health outcomes. Thus, the statistics in this study describe a series of processes, namely stress, assessment, coping strategy failure, and mental health disorders. This model shows consistency between theory and empirical findings.

The results of this study are in line with global research showing that cyberbullying increases the risk of mental disorders in adolescents [1], [4], [9]. The moderate correlation found in this study is consistent with the results of a study by Al-Turif & Al-Sanad (2023), which shows that exposure to digital aggression has a direct effect on depression and anxiety [2]. National studies such as those conducted by Veronika & Kaloeti (2021) show that digital exposure during school age can trigger symptoms of anxiety and difficulty concentrating, which is in line with the results of this study [7]. Another study by Young et al. (2024) shows a relationship between intensive social media use and an increased risk of suicide, reinforcing the argument that digital media is a serious risk factor [6]. This study expands the literature by adding five mental health indicators simultaneously, which is rarely found in previous studies, especially in Eastern Indonesia.

Interestingly, this study found differences in mental health patterns between men and women. In general, women tend to be in the higher mental health category, while men are more often found in the lower category. Women also dominate the middle category, which describes a relatively more stable mental condition. This pattern is consistent with the literature showing that adolescent women tend to express their feelings more expressively and openly, making symptoms of stress and anxiety easier to recognise [32],[40]. In contrast, men tend to suppress or hide their emotional burdens because masculine norms emphasise self-control and assertiveness [41], [42]. These differences in how emotions are expressed and dealt with may explain the differences in mental health found in this study and could form the basis for strengthening gender-sensitive psychosocial support in school environments.

The results of this study also show differences in stress levels and mental health according to region, with the western part of Makassar having the highest stress levels, followed by the northern, southern, and eastern parts. This distribution pattern is consistent with the geographical and social characteristics of Makassar, where the western and northern parts are the most densely populated areas with high commercial activity and are dominated by the Bugis community, which is socially and economically active, resulting in greater

intensity of digital interaction in these areas. This is in line with the findings of Irwanto et al. (2025), which show that areas with high digital activity tend to have higher levels of online aggression [28]. Conversely, the more suburban southern region and the more heterogeneous eastern region have lower exposure, which is in line with lower social mobility compared to the city centre. Thus, the geographical context of Makassar confirms that regional structure, population density, and digital media use play a role in exacerbating the impact of cyberbullying on adolescent mental health.

These results provide a strong basis for schools to develop digital literacy programmes that focus not only on digital safety, but also on adolescents' ability to cope with challenges. An approach based on Lazarus & Folkman's theory requires students to be taught adaptive coping strategies such as emotion regulation, stressor identification, and problem solving. Schools can offer counselling services that are more responsive to students' psychological and somatic problems. The involvement of teachers, parents, and the community is important because the impact of digitalisation does not only occur in virtual spaces but also affects the daily lives of adolescents. Measures to increase digital awareness, peer support systems, and school guidelines to combat cyberbullying are relevant steps. Thus, this study has strong practical implications for Makassar as a growing metropolitan city.

CONCLUSION

This study confirms that cyberbullying is an inherent component of adolescents' digital experiences in Makassar and significantly impacts five mental health indicators, particularly anxiety and decreased energy. Empirical findings also indicate that although most adolescents fall within the moderate exposure and mental health categories, repeated exposure still results in substantial psychological distress. Integrating these findings with Media Exposure Theory and Stress-Coping Theory suggests that consistent digital exposure acts as a cumulative stressor that impairs adolescents' self-assessment and the effectiveness of their coping strategies, thereby increasing the likelihood of developing emotional, cognitive, and somatic symptoms. Furthermore, the visual-social nature of media such as Instagram amplifies psychological impacts through open interaction, public commentary, and content circulation, thereby increasing sensitivity to social evaluation. In addition to its empirical contribution in mapping the dominant forms of cyberbullying and mental health symptoms, this study also paves the way for further research on other predictors including family support, friendship quality, and intensity of digital activity to build a more comprehensive model of adolescent mental health dynamics in a rapidly evolving digital ecosystem.

FUNDINGS
This research was not funded by any party. All costs related to this research, including data collection, analysis, and article writing, were fully covered by the authors. We declare that there was no financial support or resources from other institutions, organisations, or individuals that influenced the design, implementation, or results of this research.

ACKNOWLEDGEMENTS
This research would not have been possible without the support of various parties. I would like to express my deepest gratitude to all respondents for their openness and personal experiences. I would also like to thank my co-authors, Muliadi Mau and Muh. Iqbal Sultan from the Department of Media and Communication at Hasanuddin University for their guidance and critical input. I am also grateful to the lecturers and colleagues in the Communication Studies programme at Hasanuddin University for their intellectual support and resources. Although self-funded, this institutional support was invaluable in overcoming various challenges. Finally, I would like to thank my family and friends for their patience and irreplaceable motivation.

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