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Anxiety, Self-Esteem, Bullying, and Peer Problems as Correlates of Self-Harm Behavior Among Adolescents in Kampar Regency, Riau Province, Indonesia

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ABSTRACT

Adolescents are a vulnerable population experiencing significant psychological and social changes, often leading to emotional difficulties and maladaptive behaviors such as self-harm. This study aims to analyze the associations and predictive factors of bullying, self-esteem, anxiety, and peer relationship problems with self-harm behavior among high school students in Kampar Regency, Riau Province, Indonesia. A cross-sectional study was conducted, involving 678 adolescents aged 15–18 years who met the inclusion criteria. Data were collected using validated structured questionnaires, including the Olweus Bullying Scale, Rosenberg Self-Esteem Scale, Hamilton Anxiety Rating Scale, and Peer Relationship Scale. Univariate analysis showed that 40% of respondents had experienced bullying, 30% had low self-esteem, 25% reported moderate to severe anxiety, and 35% had peer relationship problems. The prevalence of self-harm behavior was 18%. Bivariate analysis using the chi-square test revealed significant associations between all independent variables and self-harm behavior ($p < 0.05$). Multivariate logistic regression identified moderate to severe anxiety as the strongest predictor of self-harm (OR 3.7; 95% CI: 2.3–5.8), followed by low self-esteem (OR 3.1; 95% CI: 2.0–4.9), bullying experience (OR 2.8; 95% CI: 1.9–4.2), and peer relationship problems (OR 1.8; 95% CI: 1.2–2.9). These findings establish a clear evidence base for developing comprehensive, school-based psychosocial interventions aimed at mitigating these specific risk factors to reduce the prevalence of self-harm among adolescents in Kampar Regency, Riau Province, Indonesia.

Key Messages:

- Comprehensive psychosocial interventions in schools, targeting bullying prevention, self-esteem enhancement, anxiety management, and peer relationship improvement, are urgently needed to reduce self-harm among adolescents.
- Early identification and support for at-risk students should be prioritized to address the complex interplay of psychosocial factors underlying self-harm behaviors.
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GRAPHICAL ABSTRACT

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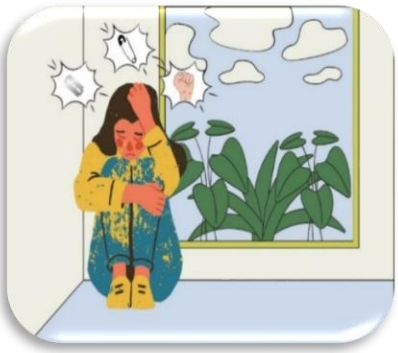
- **Bullying**
- **Self-esteem**
- **Anxiety**
- **Peer Problems**



Self Harm in Adolescents

Recommendations:
Early detection and support for at-risk students are essential to address the complex psychosocial factors underlying self-harm behavior

INTRODUCTION

Adolescence is a transitional phase from childhood to adulthood, typically ranging from 10 to 19 years of age (1). During this period, adolescents often experience identity conflicts and difficulties in emotional regulation, which can lead to negative behaviors such as self-harm, social deviance, and substance abuse (2). Self-harm behavior, frequently referred to as non-suicidal self-injury (NSSI), is defined as the deliberate, self-inflicted damage of body tissue without suicidal intent, often serving as a coping mechanism for overwhelming emotional pain (3). While not a suicide attempt, NSSI can indicate future suicidal tendencies (4) and represents an escalating global mental health concern, with approximately 17% of U.S. adolescents engaging in it (3).

A substantial body of research consistently identifies several psychosocial factors significantly associated with adolescent self-harm. These include bullying, which places adolescents at a heightened risk (5), with prevalence rates around 30% in Southeast Asia (6) and a clear link to increased self-injury risk in Indonesia (7). Low self-esteem also plays a critical role, as negative self-perceptions make adolescents more vulnerable to emotional stress and often lead to self-harm as a coping mechanism (8). Furthermore, anxiety and emotional distress are key triggers (9), evidenced by meta-analyses showing over half of depressed adolescents (often with co-occurring anxiety) have a history of self-harm (10). Poor peer relationships, fostering loneliness and lack of support, likewise contribute to self-harm risk (11). These factors often interact, aligning with the stress and coping theory where self-harm emerges when conventional coping is overwhelmed by stressors (12**,** 13**,** 14)**.** Bullying victims suffer from negative self-concept, prejudice toward the perpetrator, and fear of being hurt, leading to emotional and psychological disturbances (15). Despite this collective understanding, there remains a critical research gap in comprehensively understanding the combined impact of these specific psychosocial challenges on adolescent self-harm within localized contexts.

This phenomenon is also a growing concern in Indonesia, particularly in Kampar Regency, Riau Province. Recent local data highlight a rising prevalence of adolescent mental health disorders, including anxiety and self-harm (15**,** 16)**.** For instance, 10% of Kampar adolescents experience anxiety disorders, and nearly 6% engage in self-harm as a response to social pressures (16). Bullying also persists as a significant problem, affecting approximately 20% of adolescents in Kampar (18). These challenges are compounded by barriers such as lower parental education influencing mental health literacy (19) and limited access to mental health services due to stigma, lack of support, professional scarcity, and geographical hurdles in

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rural areas (19, 20). These local contextual factors underscore the urgent need for targeted research to inform effective interventions.

Based on this background, the present study aims to investigate the associations between bullying, self-esteem, anxiety, and peer relationship problems as contributing factors to self-harm behavior among adolescents in Kampar Regency, Riau Province, Indonesia. This research is crucial given the notable local prevalence of self-harm and the identified dearth of studies specifically addressing these psychosocial influences within the region. Understanding these relationships will provide a robust, scientifically-driven basis for developing tailored community- and school-based mental health interventions.

METHODS

This study employed a cross-sectional design to analyze the relationship between the independent variables (bullying, low self-esteem, moderate to severe anxiety, and peer relationship problems) and the dependent variable (self-harm behavior). The study population comprised all high school adolescents aged 15 to 18 years in Kampar Regency. The sample in this nursing research was determined based on inclusion and exclusion criteria.

The inclusion criteria were as follows: adolescents aged 15 to 18 years; adolescents who were still actively enrolled as high school students in Kampar Regency; adolescents who were able to communicate effectively; and adolescents who had obtained written consent from their parents or guardians to participate in the study. The exclusion criteria were: adolescents who were no longer enrolled or were inactive in high school in Kampar Regency; adolescents with a history of chronic illness requiring prolonged hospitalization; and adolescents in high schools in Kampar Regency who were unwilling to participate as respondents.

The sample size was calculated using G*Power Software Version 3.1.9.7 with an assumed $\alpha = 0.05$ (medium effect size according to Cohen et al., 1995), and a power level of 0.80, based on the study by (22). The required minimum sample was 616, with an additional 10% (62) for anticipated dropout, resulting in a final target of 678 participants.

A multi-stage sampling design was employed. First, a subset of high schools in Kampar Regency was selected via cluster sampling. Second, within these selected schools, participants were recruited through purposive sampling to ensure they met all inclusion criteria. This approach was chosen to ensure the selected sample met the required conditions while maintaining practical feasibility in a school-based setting.

Data collection utilized validated structured questionnaires, each with clearly defined measurement objectives and classification criteria. Bullying was assessed using the Olweus Bullying Scale, which measures the frequency and types of bullying experiences—including verbal, physical, and social forms. Participants were categorized as having experienced bullying if they endorsed any item indicating victimization according to the scale's established frequency thresholds. Self-esteem was measured using the 10-item Rosenberg Self-Esteem Scale, which evaluates global self-worth through both positive and negative self-perceptions; scores below 15 were classified as indicating low self-esteem. Anxiety was evaluated with the Hamilton Anxiety Rating Scale (HAM-A), a 14-item instrument assessing both psychic and somatic symptoms of anxiety, where a total score of 18 or above indicated moderate to severe anxiety. Peer relationship problems were measured using the Peer Relationship Scale, which examines issues related to social interaction, trust, and peer acceptance; scores exceeding the threshold for social maladjustment were categorized as having peer relationship problems. Lastly, self-harm behavior was assessed through a self-report question inquiring whether participants had ever intentionally engaged in self-injurious actions such as cutting, burning, or hitting themselves, with responses categorized dichotomously as “yes” or “no.”

All raw scores were transformed into categorical variables according to validated cut-off points provided by each instrument’s scoring manual. This allowed for consistent analysis and interpretation. Descriptive statistics were used in univariate analysis to present the distribution of study variables. Chi-square tests were applied for bivariate analysis to examine the relationships among variables. Finally, multivariate logistic regression identified the most significant predictors of self-harm behavior.

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RESULTS

Respondent Characteristics

This study involved a total of 678 high school adolescents in Kampar Regency who met the inclusion criteria (n = 678). The mean age of respondents was 16.5 years (SD ± 1.0), with 55% female and 45% male. Regarding grade level, 33% were in grade X, 34% in grade XI, and 33% in grade XII. The distribution of the main study variables is presented in Table 1. Among the 678 participants, 40% (n = 271) reported having experienced bullying, 30% (n = 203) had low self-esteem, 25% (n = 170) experienced moderate to severe anxiety, and 35% (n = 237) had peer relationship problems. Additionally, 18% (n = 122) of respondents reported having engaged in self-harm behaviors.

Table 1. Distribution of Research Variables among High School Adolescents in Kampar Regency (n=678)

Variable	n	%
Ever Experienced Bullying	271	40
Never Experienced Bullying	407	60
Low Self-Esteem	203	30
Moderate-High Self-Esteem	475	70
Moderate-Severe Anxiety	170	25
Mild/No Anxiety	508	75
Peer Relationship Problems	237	35
No Peer Relationship Problems	441	65
Self-Harm	122	18
No Self-Harm	556	82

Bivariate Analysis

Chi-square tests demonstrated statistically significant associations between all independent variables and self-harm behavior ($p < 0.05$). Self-harm behavior was reported more frequently among adolescents with negative psychosocial characteristics. For instance, 32% of those who had experienced bullying reported self-harm, compared to only 9% among those who had not. Similarly, 36% of adolescents with low self-esteem engaged in self-harm, while the rate was only 11% among those with moderate to high self-esteem. The highest prevalence was observed among respondents with moderate to severe anxiety, at 41%, versus 11% among those with mild or no anxiety. Peer relationship problems also showed a substantial effect, with 29% of affected adolescents reporting self-harm, compared to 13% among those without such problems. These findings suggest strong bivariate associations between each psychosocial factor and self-harming behavior, setting the foundation for multivariate analysis.

Table 2. Association Between Independent Variables and Self-Harm Behavior

Independent variable	Category	Self-Harm (n (%))	No Self-Harm (n (%))	p-value
Bullying Experience	Ever Experienced	87 (32%)	184 (68%)	<0.001
	Never Experienced	35 (9%)	372 (91%)	
Self-Esteem	Low	73 (36%)	130 (64%)	<0.001
	Moderate–High	49 (11%)	426 (89%)	
Anxiety Level	Moderate–Severe	70 (41%)	100 (59%)	<0.001
	Mild/No Anxiety	52 (11%)	456 (89%)	
Peer Relationship Problems	Yes	69 (29%)	168 (71%)	0.002
	No	53 (13%)	373 (87%)	

Note: Chi-square test was used to assess associations. Percentages represent the proportion within each subgroup. n = 678.

Multivariate Analysis

Multivariate logistic regression analysis was performed to identify the most influential factors associated with self-harm behavior among adolescents. All independent variables remained statistically

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significant after simultaneous adjustment, confirming their independent contributions to self-harming outcomes.

Moderate to severe anxiety emerged as the strongest predictor, with adolescents experiencing this condition being 3.7 times more likely to engage in self-harm compared to those with mild or no anxiety (OR = 3.7, 95% CI: 2.3–5.8; $p < 0.001$). Low self-esteem was also a strong contributor, with an adjusted odds ratio of 3.1 (95% CI: 2.0–4.9; $p < 0.001$), indicating more than threefold increased risk. A history of bullying was associated with a 2.8-fold increase in self-harm risk (95% CI: 1.9–4.2; $p < 0.001$). Finally, peer relationship problems were associated with a 1.8 times higher likelihood of self-harming behavior (95% CI: 1.2–2.9; $p = 0.004$).

These findings underscore the multifactorial nature of self-harm behavior among adolescents, with psychological distress and interpersonal adversity playing key roles. Targeted school-based mental health interventions addressing anxiety, self-esteem, bullying, and social integration may help reduce the burden of self-harm in this vulnerable population.

Table 3. Multivariate Logistic Regression Analysis of Factors Associated with Self-Harm Behavior (n = 678)

Variable	OR	95% CI	p-value
Bullying	2.8	1.9–4.2	<0.001
Low Self-Esteem	3.1	2.0–4.9	<0.001
Moderate-Severe Anxiety	3.7	2.3–5.8	<0.001
Peer Relationship Problems	1.8	1.2–2.9	0.004

Note: Multivariate logistic regression was used to estimate adjusted odds ratios (OR) and 95% confidence intervals (CI). All variables in the model were adjusted simultaneously. OR > 1 indicates increased odds of self-harm behavior.

This study found that bullying, low self-esteem, moderate to severe anxiety, and peer relationship problems were significant contributing factors to self-harm behavior among high school adolescents in Kampar Regency. Among these, moderate to severe anxiety emerged as the most dominant predictor, followed by low self-esteem, a history of bullying, and peer relationship problems. These findings, based on multivariate logistic regression analysis, emphasize the importance of considering the magnitude of risk (effect sizes) rather than relying solely on statistical significance. The results highlight the urgent need for targeted mental health support and school-based psychosocial interventions to address these risk factors and reduce self-harm behaviors among adolescents.

DISCUSSION

This study aimed to analyze the relationship between bullying, self-esteem, anxiety, and peer relationship problems with self-harm behavior among high school adolescents in Kampar Regency. The results indicate that all four variables showed significant associations with self-harm in both bivariate and multivariate analyses. These findings contribute valuable insights into the psychosocial risk profile of self-harm in Indonesian adolescents and support global trends reported in recent literature.

Our findings support the tenets of stress and coping theory, which posits that individuals engage in self-harm as a maladaptive coping mechanism when faced with stressors they feel unable to manage effectively (23). Self-harm behavior among adolescents is not a sudden occurrence but rather the complex outcome of interacting psychosocial and environmental factors. This complexity is evident in how factors like anxiety and low self-esteem can internalize the impact of external stressors like bullying and peer problems, intensifying emotional distress and increasing the likelihood of resorting to self-harm as a means of emotional regulation or escape. In this context, bullying, low self-esteem, anxiety, and peer relationship problems are considered significant influences that can increase the risk of self-harm. Adolescence, a highly vulnerable age group due to profound biological, psychological, and social changes, often presents various adjustment challenges. The inability to cope with such pressures can trigger self-harming behavior as a form of escape or an attempt to alleviate emotional pain (24).

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Bullying is one of the main risk factors for self-harm behaviour in adolescents. The results of this study show that adolescents who have experienced bullying are 2.8 times more likely to engage in self-harm than those who have never experienced bullying. These findings align with the results of a meta-analysis involving 23,388 adolescents from various countries, which found that bullying victims are 2.15 times more likely to engage in self-harm than those who have not experienced bullying (aOR=2.15; 95% CI=1.61–2.85; p<0.001) (25). Bullying, whether physical, verbal, or cyber, contributes to chronic stress, depression, social isolation, and feelings of worthlessness, all of which are recognized triggers for self-harm. Research in China further corroborates this, showing that school bullying is directly associated with non-suicidal self-injury (NSSI), with negative affect and sleep quality mediating this relationship (10). A broader meta-analysis by Holt et al. (2015) (26) highlights that any involvement in bullying significantly increases the risk of suicidal ideation and attempts, underscoring the critical need for bullying prevention and intervention. From a stress and coping perspective, bullying acts as a severe external stressor that overwhelms an adolescent's usual coping resources, pushing them towards maladaptive responses like self-harm to manage the intense psychological pain.

Low self-esteem was also significantly associated with self-harm behavior, with adolescents experiencing low self-esteem 3.1 times more likely to self-harm than those with moderate to high self-esteem. This supports findings by Delrosso et al. (27), that identify low self-esteem as a strong predictor, particularly among female adolescents. Low self-esteem, characterized by negative self-views and feelings of worthlessness, increases vulnerability to stress and can lead to self-harm as a maladaptive coping mechanism (28). This aligns with stress and coping theory, as low self-esteem can diminish an individual's perceived ability to cope with challenges, making stressors feel more overwhelming and self-harm a more readily accessed, albeit harmful, coping strategy.

Anxiety emerged as a particularly strong correlate in this study, with an odds ratio (OR) of 3.7, indicating adolescents with moderate to severe anxiety were nearly four times more likely to self-harm. This aligns with international research showing strong associations between anxiety, depression, and self-harm (29). Adolescents under emotional distress often use self-harm to reduce negative feelings. While anxiety demonstrated the largest odds ratio in this specific model (OR=3.7), it is crucial to recognize that the magnitude of an OR can be influenced by the chosen cutoff points for categorization. Thus, while statistically prominent, the findings underscore the importance of understanding anxiety as an integral part of a comprehensive risk profile, rather than an isolated, singularly dominant factor. All four psychosocial factors are important components of a multifaceted risk landscape for adolescent self-harm. Research also indicates that social anxiety can mediate the relationship between peer problems and self-harm, as discomfort in peer interactions can push adolescents towards self-harm as an escape (30). Within the stress and coping framework, high anxiety signifies an elevated level of internal distress, which, if not managed through healthy mechanisms, can directly lead to maladaptive coping behaviors like self-harm as an attempt to rapidly alleviate overwhelming emotional states.

Problems in peer relationships also significantly contributed to self-harm behavior, with adolescents facing such difficulties being 1.8 times more likely to engage in self-harm. This is supported by studies showing that poor social relationships can increase self-harm risk through heightened negative affect and sleep disturbances (31). Adolescents heavily rely on peer support for identity formation and security. Disrupted peer relationships can lead to loneliness, isolation, and a lack of emotional confidants, triggering emotional stress that manifests as self-harm (32). Group Counseling integrated with Cognitive Behavioral Therapy significantly enhances self-efficacy among individuals who have experienced bullying (33). Parents should pay attention and always ask about the activities they are carrying out and understand their children's feelings so that they trust them and do not hesitate to talk about their children's problems (34). It is important to acknowledge the potential for bidirectional relationships among these factors; for instance, while anxiety can predict self-harm, the act of self-harming itself could subsequently exacerbate anxiety, further diminish self-esteem, or strain peer relationships. Similarly, being bullied can lead to self-harm, but engaging in self-harm could also lead to further social isolation or victimization. From a stress and coping perspective, disrupted peer relationships represent a significant social stressor, undermining an adolescent's social support resources and making them more vulnerable to internalizing distress, which

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can precipitate self-harm if effective social coping strategies are absent.

In many parts of Indonesia, particularly non-urban areas, mental health stigma remains pervasive, and access to appropriate psychological services is limited. These barriers are compounded by cultural taboos surrounding emotional expression and a general lack of mental health literacy among adolescents and their families. As a result, distress stemming from issues such as anxiety, peer rejection, or bullying may not be addressed through healthy coping strategies or professional support. Instead, these unresolved psychosocial stressors may manifest as maladaptive behaviors, including self-harm. Such cultural and systemic dynamics may partially explain the strength of the associations observed in this study and highlight the need for future research to include qualitative approaches that explore these lived experiences more deeply.

The study also presents several practical implications for intervention. First, in terms of school-based policies, educational institutions should prioritize the implementation of anti-bullying programs, the establishment of peer-support systems, and the cultivation of inclusive school environments. These initiatives should involve collaboration among teachers, counselors, students, and parents to ensure a comprehensive and sustainable approach. Second, for mental health practitioners, particularly school counselors and psychologists, targeted training is needed to enhance early detection of psychological vulnerabilities such as anxiety, low self-esteem, and bullying involvement. Evidence-based interventions, including cognitive-behavioral therapy (CBT), resilience-building programs, and self-esteem enhancement modules, should be integrated into school counseling frameworks. Third, future research should adopt longitudinal designs to examine causal pathways underlying adolescent self-harm and explore protective and resilience factors that may buffer at-risk individuals from engaging in such behaviors.

Nevertheless, this study is not without limitations. Its cross-sectional design restricts the ability to establish causality, and the potential for bidirectional or cyclical relationships between key variables—such as self-harm and self-esteem—must be acknowledged. Additionally, reliance on self-reported data introduces risks of recall bias and social desirability bias. Finally, because the study was conducted within a single regency, the generalizability of its findings to adolescents in other geographic or cultural settings should be approached with caution.

CONCLUSION

This study demonstrates that bullying, low self-esteem, moderate to severe anxiety, and peer relationship problems are all significantly associated with an increased risk of self-harm behavior among high school adolescents in Kampar Regency. While all these factors showed significant associations, multivariate analysis identified moderate to severe anxiety as the statistically strongest link in this cohort, followed by low self-esteem, bullying, and peer relationship problems. These findings highlight the complex interplay of psychosocial factors contributing to self-harm in adolescents and underscore the urgent need for comprehensive preventive interventions, given the vulnerability of adolescents during this critical developmental period and the potential for self-harm to lead to severe long-term consequences**.** Such interventions should focus on reducing bullying, enhancing self-esteem, managing anxiety, and strengthening positive peer relationships within the school environment. Ultimately, these findings call for integrated, multi-level interventions within educational systems and broader community support to foster resilience and mitigate the risk of self-harm among adolescents, contributing to their overall well-being and a healthier society**.**

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CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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