

# Relationship between stress, anxiety, and depression with suicidal ideation in adolescents

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## ABSTRACT

**Introduction:** Suicide is a significant mental health problem in adolescents worldwide that requires comprehensive treatment. This study examined the relationship between stress, anxiety, and depression with suicidal ideation among Indonesian adolescents.

**Methods:** This cross-sectional study examined 869 high school adolescents. Suicide ideation was a dependent variable, while stress, anxiety, and depression were independent variables in this study. The instrument used to measure stress, anxiety, and depression is the Depression Anxiety Stress Scale (DASS-21), while the idea of suicide was measured using the Scale for Suicide Ideation (SSI) instrument. Data were analyzed with Spearman statistical test to examine the association between variables.

**Results:** The results showed that teenagers who had suicidal ideation were 23.7% of respondents, while 12.4% had a high intention of suicidal ideation. A total of 44.4%, 72.7%, and 71.4% of teens experienced stress, anxiety, and depression in the mild to very severe categories, respectively. There was a significant relationship between suicidal ideation with stress levels (p-value < 0.001; r value = 0.267), anxiety (p-value < 0.001; r value = 0.237), and level of depression (p-value < 0.001; r value = 0.233) in adolescents.

**Conclusions:** The study's findings revealed that stress, anxiety, and depression significantly affect suicide ideation in adolescents. Therefore, to prevent increased suicide ideation in adolescents, mental and psychological health support measures must be given to deal with stress, anxiety, and depression.

**Keywords:** adolescents; anxiety; depression; stress; suicidal ideation

## Introduction

Mental health problems in adolescents have become a worldwide concern. In the last few decades, research on mental health problems in adolescents has been carried out (Bruha et al., 2018), such as in the United States (Mojtabai and Olfson, 2020), UK (Fink et al., 2015), Italy (Frigerio et al., 2009), Australia (Allen and McKenzie, 2015), Korea (Roh et al., 2016), China (Wang, Zhang and Zhang, 2020), and Malaysia (Ahmad et al., 2015). Mental health problems in adolescents are very complex, consisting of bullying, gaming or internet addiction,

emotional disorders (anxiety, depression, frustration, anger), and suicide-self harm (WHO, 2019a).

In 2015, suicide became the 20th most common cause of death globally. Data from WHO (2019) report that around 800,000 people die from committing suicide each year, accounting for 1.5% of all deaths and the second leading cause of death at 15-29 years (WHO, 2019b). In North America, suicide is the 10th most common cause of death (Fazel and Runeson, 2020). In recent years in Indonesia, the phenomenon of suicide has been increasingly worrisome. The WHO estimates that the suicide rate in Indonesia could reach 3.4% of 100,000



people if it does not receive serious attention from various parties (WHO, 2018). Meanwhile, data in East Java province in 2018 showed that as many as 549 suicide cases occurred in East Java (Badan Pusat Statistik, 2019).

Suicide is an action to end life intentionally and is carried out consciously (Wuryaningsih et al., 2018). Suicide consists of various terms, such as self-injury, suicide ideas, suicide plans, and completed suicide. Suicidal ideation is the thought of death caused by oneself. Suicidal ideation can be passive when there are only thoughts of suicide without the intention to act or can be expressed directly, verbally, or not shown at all (Stuart, 2016). Suicidal ideation was found prevalent in adolescents (Strandheim et al., 2014). Someone who has the idea of suicide experiences social isolation, low self-esteem, and lack of trust with others, tends to think negatively, is inflexible, and feels powerless over his life (Austin andKunyk, 2019). Suicidal ideation is positively and significantly related to the occurrence of suicide attempts (Ziaaddini, Navadeh and Saeedi, 2009). So, it is crucial to look at factors related to suicidal ideation.

Among adolescents, the prevalence of suicide attempts, suicide ideation, and self-harm reaches 6%, 18% 13.5%, respectively, where suicide behavior is influenced by internal and external factors such as low individual coping, misuse of smartphones, nutrition imbalance, bad lifestyle, low interaction in family, bullying, and social problems (Lim et al., 2019; Rohmana, Estelina and Iskandar, 2020; Ati, Paraswati and Windarwati, 2021). However, the risk of suicide is also related to attitude toward problems and personality aspects (Sharif et al., 2014), namely hostility, impulsivity, depression, and despair, while anti-social symptoms and depression often appear at a young age (Stuart, 2016). Research related to suicidal ideation among university students in Tehran showed that depression, anxiety, and daily stress were positively associated with suicidal ideation (Izadinia et al., 2010).

Stress is an intrinsic and extrinsic stimulus that causes a biological response and compensatory response to the stimulus (Stewart et al., 2019). Stress can cause various actions on the body, ranging from homeostasis changes to life-threatening effects (Stewart et al., 2019). Exposure to focus is at the core of the theory of suicide, and stress is associated with suicidal ideation, especially in adults and adolescents (Yaribeygi et al., 2017). Anxiety is a normal human emotion, which involves behavior, affective, and cognitive responses when facing the perception of danger. Anxiety is considered excessive or pathological when it causes significant distress or distraction. Anxiety often co-exists with depression (Craske and Stein, 2016). Depression is a common mental disorder characterized by constant sadness and a lack of interest or pleasure in previously beneficial or enjoyable activities (WHO, 2019). Depression is associated with substantial current and future morbidity and increases the risk of suicide (Thapar et al., 2012).

Based on the importance of the risk factors for suicidal ideation in adolescents and the limited research conducted on this topic, especially in Indonesia, the present study aimed to examine the relationship between stress, anxiety, depression, and associated factors with the emergence of suicidal ideation in adolescents. The study's results are expected to be a catalyst in providing healthcare for adolescents with suicidal ideation in Indonesia.

## Materials and Methods

### Study Design

A cross-sectional survey design was employed in this study.

### Respondent

The population and sample were all adolescents aged between 15-16 years from five high schools in East Java Province, Indonesia. The total sampling method was employed to select respondents from five high schools in this study, with sample size of 869 adolescents. The inclusion criteria in this study were 1) high school first-grade adolescents aged 15-16 years, 2) willing to take part in the study, and 3) completing the questionnaire.

### Instrument

Data were gathered using a questionnaire to determine the respondents' demographic data, suicide ideation, stress, anxiety, and depression.

Stress, anxiety, and depression were measured using the Depression Anxiety Stress Scale (DASS-21), validated, and translated into the respondents' national language (Indonesian language). DASS-21 is a well-established instrument for measuring depression, anxiety, and stress symptoms in clinical and non-clinical samples (Lovibond and Lovibond, 1995). The instrument consists of 21 questions with an answer rating scale of 0 (never), 1 (sometimes), 2 (often), and 3 (always). The score on DASS-21 will be multiplied by two to calculate the final score. The cut-off score for depression was 0-9 (normal), 10-13 (mild), 14-20 (moderate), 21-27 (high), and > 28 (very high). The cut-off points for anxiety were 0-7 (normal), 8-9 (mild), 10-14 (moderate), 15-19 (high), and > 20 (very high). The cut-off points for stress were 0-14 (normal), 15-18 (mild), 19-25 (moderate), 26-33 (High), and > 34 (Very High) (Lovibond and Lovibond, 1995; Brumby et al., 2011). The DASS-21 Indonesian version questionnaire has passed the validity and reliability test (Cronbach's alpha > 0.7).

Furthermore, suicide ideation was measured using the Scale for Suicide Ideation (SSI) instrument, validated, and translated into the respondents' national language (Indonesian language). The SSI instrument is an ideal tool in the psychological and clinical investigation of suicidal ideation and differentiates individuals based on their level of suicidal ideation (Beck, Kovacs and

Weissman, 1979). The cut-off points for suicide ideation were 0 (did not have suicide ideation), 1 (low/minimal suicide ideation), and >1 (high suicide ideation). The SSI Indonesian version questionnaire has passed the validity and reliability test (Cronbach's alpha > 0.7).

### Data Analysis

The data analyses conducted were univariate and bivariate. Descriptive analysis as frequency and percentage were used for categorical variables. Spearman Rank Analysis was used to see the correlation between the two variables. Suicide ideation was a dependent variable, while stress, anxiety, and depression were independent variables in this study. Correlation analysis was said to be significantly related if the p-value < 0.05. Data analysis was performed using Statistical Package for Social Sciences (SPSS) version 16.

### Ethical Consideration

This study was approved by the Health Research Ethics Committee of the Health Polytechnic of the Ministry of Health Malang with an Ethical Approval Certificate ("Ethical Approval") Reg. Number. 335 / KEPK-POLKESMA / 2019. Before participating in the research, participants were given an explanation related to the research to be conducted. For ethical reasons, informed consent was sent to the participants. Participants who agreed to participate in this research signed the informed consent. The participation of respondents in this study was voluntary. This study followed ethical research principles, which include beneficence, justice, and respecting human dignity.

### Results

Mostly, adolescents in this study did not have suicidal ideation (76.3%). However, as many as 23.7% of adolescents had the intention of suicide ideation, while 12.4% of respondents had high suicide ideation. Most participants did not experience stress (55.6%) or depression (28.5%). In the anxiety variable, it can be seen that the majority of adolescents' experience anxiety in the very high category (36.1%), and as many as 27.3% of adolescents did not have anxiety. In conclusion, 44.4%, 72.7%, and 71.5% of adolescents experienced minimal to very high stress, anxiety, and depression, respectively (Table 1).

Table 2 shows as many as 413 (47.5%) of adolescents who did not intend suicide ideation also did not experience stress. In contrast, 3% of students had a high intention of suicide ideation and very high-stress levels. The bivariate analysis results in Table 2 concluded a significant relationship between stress levels with suicidal ideation in adolescents, as indicated by the p-value of < 0.001. In addition, the correlation coefficient of 0.267 indicated a positive direction between variables.

Table 1 Characteristics of research respondents (N = 869)

Characteristics	n	%
<b>Sex</b>		
Female	426	49.0
Male	443	51.0
<b>Suicidal ideation</b>		
High	108	12.4
Low	98	11.3
None	663	76.3
<b>Stress</b>		
Very high	65	7.5
High	96	11.0
Moderate	131	15.1
Mild	94	10.8
Normal/none	483	55.6
<b>Anxiety</b>		
Very high	314	36.1
High	104	12.0
Moderate	119	13.7
Mild	95	10.9
Normal/none	237	27.3
<b>Depression</b>		
Very high	190	21.9
High	112	12.9
Moderate	205	23.6
Mild	114	13.1
Normal/none	248	28.5

Based on Table 2, the analysis concluded a significant relationship between the level of anxiety with suicidal ideation in adolescents, as indicated by the value of p-value < 0.001. Furthermore, the correlation coefficient of 0.237 indicates a positive relationship between variables.

In terms of depression, it showed a significant relationship between the level of depression with suicidal ideation in adolescents, as indicated by the value of p-value < 0.001. The correlation coefficient of 0.233 shows a positive relationship between variables. This study concluded that stress, anxiety, and depression have a significant and positive relationship with suicide ideation in adolescents. This showed that the lower the stress, anxiety, and depression level, the suicidal ideation in adolescents was also getting lower, and vice versa.

### Discussions

The present study investigates the relationship between stress, anxiety, and depression with the emergence of suicidal ideation in adolescents. Based on the findings, this study indicated that stress, anxiety, and depression had a significant and positive relationship with suicide ideation in adolescents. The results of this study were in line with research conducted by Izadinia et al. (2010), which showed that stress, anxiety, and depression correlate positively and significantly with thoughts of suicide. In addition, other studies also indicated that stress, depression, and anxiety were the major risk factors for suicidal behavior (Nguyen et al., 2013; Lew et al., 2019).

The idea of adolescent suicide arises because, at this stage, the emotional development that occurs is still unstable (Asante et al., 2017). The percentage of suicide ideas, suicide plans, and attempted suicides have a high

Table 2 Spearman rank correlation analysis of stress, anxiety, and depression with suicidal ideation

		Suicidal ideation								P-value	r
		High		Low		None		Total			
		n	%	n	%	n	%	n	%		
<b>Stress</b>	Very High	26	3.0	4	0.5	35	4.0	65	7.5	<0.001	0.267
	High	16	1.8	14	1.6	66	7.6	96	11		
	Moderate	25	2.9	26	3.0	80	9.2	131	15.1		
	Mild	15	1.7	10	1.2	69	7.9	94	10.8		
	Normal	26	3.0	44	5.1	413	47.5	483	55.6		
Total		108	12.4	98	11.3	663	76.3	869	100		
		Suicidal ideation								P-value	r
		High		Low		None		Total			
		n	%	n	%	n	%	n	%		
<b>Anxiety</b>	Very High	69	7.9	42	4.8	203	23.4	314	36.1	<0.001	0.237
	High	17	2.0	12	1.4	75	8.6	104	12.0		
	Moderate	5	0.6	12	1.4	102	11.7	119	13.7		
	Mild	7	0.8	14	1.6	74	8.5	95	10.9		
	Normal	10	1.2	18	2.1	209	24.1	237	27.3		
Total		108	12.4	98	11.3	663	76.3	869	100		
		Suicidal ideation								P-value	r
		High		Low		None		Total			
		n	%	n	%	n	%	n	%		
<b>Depression</b>	Very High	49	5.6	25	2.9	116	13.3	190	21.9	<0.001	0.233
	High	14	1.6	18	2.1	80	9.2	112	12.9		
	Moderate	27	3.1	21	2.4	157	18.1	205	23.6		
	Mild	6	0.7	14	1.6	94	10.8	114	13.1		
	Normal	12	1.4	20	2.3	216	24.9	248	28.5		
Total		108	12.4	98	11.3	663	76.3	869	100		

rate at 17 years and 18 years and above (Asante et al., 2017). The percentage of suicide risk rates are high at ages 15 until 18 years, and this age range is a stage of late adolescence (Yeomans and Christensen, 2017), where, in this study, the age of the respondents was between 15-16 years. The previous research stated that stress occurs a lot in adolescence, accompanied by depression and anxiety (Duarte et al., 2019). Youth is a period that often elicits stressful conditions because, during this time, puberty hits as the peak of growth and development, both physically and mentally (Miller and Prinstein, 2019). Stress can occur due to pressure on unwanted thoughts such as the burden or problems inside the family environment (Windarwati et al., 2020). Stress also happens to those who suppress their feelings and refrain from openly expressing emotions (Kim, Bassett and Voisin, 2019). Emotional status in adolescence is still changing between behavior that shows maturity with childish acts. Academic stress factors can play an essential role in determining adolescent mental health (Waghachavare et al., 2013). About 26% of high school students in the study had high levels of educational stress. Stress is a significant risk factor causing depression (Asante et al., 2017). Stress is related to anxiety and depression and is a significant risk factor for teen suicidal ideation.

This study suggested that the lower the stress level, the lower the suicide idea, and vice versa. Various work stressors and related life stressors, such as stressful events, loss, unemployment, and other environmental stressors, link to suicidal ideation (Ibrahim, Amit and Suen, 2014). This study showed that stress was positively related to suicidal ideation. The problem is how to adapt

to stress without experiencing distress because distress can trigger psychological effects such as anxiety and depression. Interaction of various aspects of stress can complicate optimal stress management and generate suicidal ideation (Ibrahim, Amit and Suen, 2014).

The lower the anxiety indicated, the lower the suicidal ideation in adolescents. Adolescents who experience anxiety tend to have a higher level of vigilance and concern about something that has not yet happened. Adolescents who experience anxiety can affect daily activities related to weakness and powerlessness (Craske et al., 2017). Adolescence is a period where individuals are worried about their future and face various pressures from family, school environment, and peers. This situation makes adolescents feel anxious, with emotions that are still unstable, and difficulty in solving difficult problems can make teens have ideas for suicide or self-injury as a way out of anxiety experienced. People with anxiety were more likely to have suicidal ideation, attempted suicide, and completed suicide than those who did not experience anxiety (Malik et al., 2014).

There was a significant relationship between the level of depression with suicidal ideation in adolescents. The lower the depression level indicated, the lower the suicide idea. Depression in adolescents occurs due to overflowing emotions and immaturity in making decisions and continuing the physiological development process. The high incidence of depression is caused by the increased responsibility they have to bear, both responsibility to parents, teachers, and those closest to them. There are various physical, social, emotional, and academic challenges in adolescents. This stage is also the peak age of onset of many mental health disorders (Ibrahim, Amit

and Suen, 2014). Furthermore, psychological conditions of students generally cause depression in adolescents, relationship problems with friends (boy/girlfriend), academic problems at school, relationship problems with parents and family, relationship problems with classmates, financial issues, relationship problems with teachers, and physical health problems (Magklara et al., 2015). Lack of parental supervision, alcohol abuse, and smoking are also significant risk factors for teenage depression (Asante et al., 2017). Suicidal ideation in late teens is caused by depression (Asante et al., 2017). Depression is a significant cause of suicide in adolescents (Towsend, 2018). Depression is associated with feelings of individual despair, helplessness, and lack of social support and skills to overcome difficulties and a stressful life (Ibrahim, Amit and Suen, 2014). Depression can also be a response to the loss of parents, relatives, friends, or the end of a relationship with a lover (Towsend, 2018).

Early adolescence is the initial stage of puberty, the regulation system itself is still immature, so it tends to exhibit unstable emotions (Curtis, 2015). The frontal lobe, which is part of the brain to regulate reasoning and decision-making, begins to develop during early adolescence. Consequently, adolescents tend to act impulsively and think uncritically (UNICEF, 2011). In the late adolescence stage, emotions that are not yet sufficiently stable and a self-regulation system that is still developing gives this age stage an emotional status that is ever-changing between behavior that shows maturity and acting like children (Curtis, 2015). More complex problems in late adolescence lead to a higher prevalence of depression and a higher risk of suicide at this age. However, physical development and growth will continue at this stage, including the frontal lobe, which is part of the brain that governs reasoning and decision-making. Frontal lobes that experience further development cause late adolescents to tend to have the power of reasoning and the ability to make their own decisions well (Curtis, 2015). Therefore, coping mechanisms must be strengthened at this age. Anxiety and depression are related to the idea of suicide and self-injury. Adolescents with suicidal ideation and self-injury tendencies have higher depression, anxiety, and stress levels.

The use of a cross-sectional survey design in the present study is not without limitations. For instance, it cannot determine the causal relationship among variables. However, this study was conducted in a population with a large enough number and the same respondents (10th grade) characteristics, so the results are expected to reduce possible bias. Furthermore, this study can also add to the literature on risk factors for suicide in adolescents in Indonesia, which is still very limited.

## Conclusions

This present study indicated that stress levels, anxiety, and depression correlated positively and significantly with suicidal ideation in adolescents. Stress, anxiety, and depression comprise a condition that is closely related to adolescent activities and is close to teenage life. Therefore, nurses have to provide mental health education in the form of counselling, psychoeducation, and screening to adolescents, teachers, and parents of students who are healthy and at-risk of mental health problems. At the same time, students who experience mental health problems that can cause suicide ideas should be given psychotherapy in the form of cognitive-behavioral therapy to overcome their problems. Mental Health Service Providers have to pay great attention to adolescents regarding psychological issues due to emotional burdens experienced by adolescents either at school, at home, or in the environment that can cause mental health problems, especially stress, anxiety, and depression in adolescents. Schools need to develop a school mental health unit to promote and prevent stress in adolescents through early detection, mental health therapy, and psychosocial support. Lastly, further research is needed to identify the causal relationship between stress, anxiety, depression with suicide ideation in Indonesia. It is hoped that a decrease in adolescent suicide ideation has implications for decreasing the incidence of suicide in adolescents.

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