



Hope as a Mediator in the Relationship between Gratitude and Life Satisfaction among Science Students

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ABSTRACT

Purpose of the study: This study aimed to examine the effect of gratitude on life satisfaction among students and to investigate whether hope mediates this relationship. The study also sought to clarify the psychological mechanism through which gratitude contributes to life satisfaction.

Methodology: This quantitative survey involved 475 science students selected using an accidental sampling technique. Data were collected using the Gratitude Questionnaire-6 (GQ-6), Snyder's Hope Scale (SHS), and the Satisfaction with Life Scale (SWLS). Mediation analysis with 5,000 bootstrap resamples was performed using Jamovi version 2.6.

Main Findings: These findings suggests that efforts to improve adolescent life satisfaction need to consider developing hope in addition to gratitude. The findings showed that hope significantly mediated the relationship between gratitude and life satisfaction. The indirect effect of gratitude on life satisfaction through hope was significant ($\beta = 0.28379$, $p < 0.001$), whereas the direct effect became non-significant after hope was included in the model ($\beta = -0.00332$, $p = 0.955$), indicating full mediation. These findings suggest that gratitude contributes to students' life satisfaction primarily by strengthening hope.

Novelty/Originality of this study: This study provides empirical evidence that hope functions as a full mediator in the relationship between gratitude and life satisfaction among students. The findings extend the application of Hope Theory by clarifying the psychological mechanism through which gratitude enhances life satisfaction and provide practical implications for developing interventions that integrate gratitude and hope to promote students' psychological well-being.

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1. INTRODUCTION

Life satisfaction is a cognitive component of subjective well-being which refers to an individual's global evaluation of the quality of his or her life based on standards set by himself or herself [1]. Life satisfaction not only reflects an individual's assessment of various aspects of their life but also reflects the extent to which the life they live aligns with their hopes and goals. During Student, life satisfaction becomes an important aspect because it is related to psychological well-being, adaptability, mental health, and success in undertaking developmental task [2].

Student is a period of development marked by physical, psychological and social changes that occur simultaneously, making students a group that is vulnerable to experiencing various psychological problems and decreased well-being, including life satisfaction [3], [4]. This vulnerability is evident in the high prevalence of mental health problems in students, where approximately one in seven students experience mental health disorders [5]. Various factors, such as academic pressure, family conflict, and exposure to media and social media, can increase stress, anxiety, and depression, which ultimately lead to low life satisfaction [6]-[10].

Life satisfaction is an important aspect of psychological well-being because it reflects an individual's evaluation of their overall quality of life. During Student, life satisfaction plays a role in the formation of identity, commitment to life values and goals, motivation, and psychological and social well-being [11], [12]. Therefore, life satisfaction is an important indicator that describes the psychological functioning and quality of life of students. Teenagers who have high life satisfaction tend to be better able to control their emotions, establish positive relationships with others, develop creative thinking, have independence, feel useful, and show better adaptability in academics and interpersonal relationships [13], [14]. Conversely, low life satisfaction is associated with increased vulnerability to stress, anxiety, and depression, low self-esteem, feelings of loneliness, difficulty building positive social relationships, and increased risky behaviors such as risky sexual behavior, alcohol use, and drug abuse [14]-[19].

Indonesia's life satisfaction level still requires attention. According to the Gallup World Poll, Indonesia scored 5.5 on a 0–10 scale in 2018–2019 and 2021–2022, indicating that Indonesians' life satisfaction remains relatively low compared to the countries compared in the report [20]. In addition, the level of life satisfaction of the people of Yogyakarta is 74.51 and the level of life satisfaction of Indonesian youth is 71.92, both of which are still below the global average of 75.16 [21]. This condition indicates that subjective well-being, especially in students, still requires attention. In line with this, World Health Organization [22] emphasized that mental health is an important part of an individual's well-being. Understanding psychological factors that promote life satisfaction is essential because adolescence is a critical developmental period in which psychological well-being influences academic achievement, mental health, and future adjustment. Identifying protective factors may contribute to preventive mental health programs for adolescents. However, the report Ministry of Health of the Republic of Indonesia [23] reported that the 15–24 age group is the group most vulnerable to experiencing psychological disorders, while various social, academic and family pressures during Student can also affect their level of life satisfaction [24]. This condition indicates that life satisfaction in students remains an issue that requires attention, particularly in the context of the psychological factors that influence it.

The Special Region of Yogyakarta is a region with unique characteristics as a student city with high academic and social dynamics. The abundance of educational institutions and intense academic competition means that students in Yogyakarta face various developmental demands that can impact their psychological well-being [25], [26]. Furthermore, the collectivist nature of Javanese culture, which upholds social values, fosters a unique relationship between gratitude, hope, and life satisfaction. This situation has the potential to increase psychological demands, which can influence students' evaluations of their lives, including life satisfaction. Therefore, research on life satisfaction among students in the Special Region of Yogyakarta is crucial.

Life satisfaction in students is influenced by various factors, such as supportive social relationships, individual characteristics, culture, socio-economic conditions, and psychological factors, including self-esteem, hope, and gratitude [27]-[33]. Among these factors, gratitude is one of the positive psychological factors that is consistently associated with increased social support, self-esteem, hope, emotional well-being, and life satisfaction [33]-[36], gratitude is a positive emotion that improves well-being by strengthening social relationships and creating feelings of satisfaction with life. Various studies show that gratitude increases positive emotions, strengthens social relationships, reduces negative emotions, and contributes to adolescent life satisfaction [37], [38]. Individuals who have high levels of gratitude tend to be better able to manage stress, have healthier psychological conditions, receive better social support, and show higher levels of life satisfaction [33], [36], [39].

The relationship between gratitude and life satisfaction is thought to be less direct and more mediated by hope [33]. According to Hope Theory, hope is an individual's ability to set goals (agency) and find strategies to achieve them (pathways). Snyder et al [40] Hope enables individuals to maintain motivation, view the future more positively, and increase life satisfaction [41]. Students who exhibit high levels of gratitude and hope tend to demonstrate higher levels of life satisfaction, supported by increased positive emotions, social support, and orientation toward life goals [12], [33], [42], [43]. Many previous studies have established that gratitude is positively associated with life satisfaction and that hope is associated with psychological well-being. However, empirical evidence regarding the mediating role of hope in the relationship between gratitude and life satisfaction remains limited, particularly among Indonesian adolescents. Most existing studies were conducted in China or involved university students, disaster survivors, or other specific populations. Consequently, it is still unclear whether the same psychological mechanism applies to Indonesian adolescents, who experience different sociocultural and educational contexts.

Several studies have supported the role of hope as a mediator in the relationship between gratitude and life satisfaction. Zhou et al. [33] found that hope mediated the relationship in adolescent disaster survivors in China, while Cui [43] demonstrated that hope was a significant mediator between gratitude and subjective well-being. Other studies have also shown that the influence of gratitude on life satisfaction can occur through social support, self-esteem, reduced emotional distress, and the quality of parent-child relationships [33], [36], [44]. These findings suggest that gratitude enhances life satisfaction through various psychological mechanisms, with hope being an important one.

However, most previous studies have been conducted in different cultural contexts and with different respondent characteristics, such as adolescent disaster survivors, college students, or students in other countries [33], [36], [44]. Unlike previous studies that focused on disaster survivors, university students, or non-Indonesian populations, this study examines whether hope functions as a mediator between gratitude and life satisfaction among Indonesian adolescents. The findings extend Hope Theory within a different cultural setting and clarify the psychological mechanism linking gratitude and life satisfaction.

2. RESEARCH METHOD

This study employed a quantitative approach with a survey design to examine the mediating role of hope in the relationship between gratitude and life satisfaction among students [45]. The target population comprised students aged 12–22 years residing in the Special Region of Yogyakarta. The minimum required sample size was determined using the Krejcie and Morgan table [46], resulting in a minimum of 383 participants. A total of 475 adolescents participated in this study. Participants were selected using accidental sampling, a non-probability sampling technique in which respondents were recruited based on their accessibility and willingness to participate, provided they met the inclusion criteria [47].

Data were collected between February and April 2026 through both online and offline surveys. The online questionnaire was distributed via Google Forms through social media platforms, while the offline survey was administered directly to eligible participants in schools, universities, and public places across all regencies and municipalities in the Special Region of Yogyakarta. Before completing the questionnaire, all participants were informed about the purpose of the study and voluntarily agreed to participate. This study involved three variables: gratitude as the independent variable, life satisfaction as the dependent variable, and hope as the mediating variable. Gratitude was measured using the Indonesian adaptation of the Gratitude Questionnaire-6 (GQ-6), originally developed by McCullough et al. Hope was measured using the Indonesian adaptation of Snyder's Hope Scale (SHS), adapted by Izzaty and Ayryza. Life satisfaction was measured using the Indonesian adaptation of the Satisfaction with Life Scale (SWLS), originally developed by Diener et al. and adapted by Muttaqin. Internal consistency reliability was assessed using Cronbach's alpha. The reliability coefficients obtained in this study were 0.714 for the GQ-6, 0.846 for the SHS, and 0.815 for the SWLS, indicating acceptable reliability for all instruments.

Data analysis was conducted using Jamovi version 2.6. Descriptive statistics were first performed to summarize participant characteristics and study variables. Assumption tests, including normality, heteroscedasticity, and multicollinearity tests, were subsequently conducted to ensure that the data met the assumptions required for regression analysis. The hypotheses were tested using simple regression analysis and mediation analysis based on the bootstrapping method with 5,000 resamples. Statistical significance was determined at a significance level of $p < 0.05$.

3. RESULTS AND DISCUSSION

This study involved 475 students aged 12–22 years living in the Special Region of Yogyakarta. Descriptive statistics showed that the average score for life satisfaction was 22.60 (SD = 5.50), gratitude was 35.50 (SD = 4.91), and hope was 45.40 (SD = 8.35). In general, respondents' levels of life satisfaction were in the moderate category, while gratitude and hope were in the high category. A summary of the descriptive statistics is presented in Table 1.

Table 1. Descriptive Statistics

Variables	Min	Max	Mean	Elementary School
Life satisfaction	5	35	22.60	5.50
Gratitude	6	42	35.50	4.91

Prior to hypothesis testing, regression assumption tests were conducted, including normality, multicollinearity, and heteroscedasticity. The results of the normality test showed a normally distributed residual (Kolmogorov–Smirnov = 0.034; $p = 0.630$). The multicollinearity test showed a VIF value of 1.25 and a

tolerance of 0.799, indicating no signs of multicollinearity. Furthermore, the Breusch–Pagan test results indicated no heteroscedasticity (Statistic = 4.15; $p = 0.125$). Thus, all regression assumptions were met, allowing for mediation analysis.

Table 2. Results of Regression Hypothesis Testing

Track	Estimate	β	t	p	R ²
Gratitude → Hope	0.763	0.448	10.90	<0.001	0.201
Hope → Life satisfaction	0.371	0.564	14.84	<0.001	0.318
Gratitude → Life satisfaction	0.280	0.250	5.62	<0.001	0.063

The results of the regression analysis showed that gratitude had a positive and significant effect on hope ($\beta = 0.448$; $p < 0.001$). Hope also had a positive and significant effect on life satisfaction ($\beta = 0.564$; $p < 0.001$). In addition, gratitude had a positive effect on life satisfaction ($\beta = 0.250$; $p < 0.001$). Thus, the first, second, and third hypotheses were accepted.

Table 3. Results of Expectancy Mediation Analysis

Effect	Estimate	95% CI	p	Mediation
Indirect effect (a × b)	0.28379	0.194–0.375	<0.001	98.84%
Direct effect (c')	-0.00332	-0.121–0.106	0.955	1.16%
Total effect (c)	0.28047	0.159–0.382	<0.001	100%

The results of the mediation analysis showed that the indirect effect of gratitude on life satisfaction through hope was significant (Estimate = 0.284; 95% CI = 0.194–0.375; $p < 0.001$). Conversely, the direct effect of gratitude on life satisfaction was not significant (Estimate = -0.003; $p = 0.955$). These results indicate that hope fully mediates the relationship between gratitude and life satisfaction in students in the Special Region of Yogyakarta. The significant indirect effect of gratitude on life satisfaction through hope indicates that hope functions as a key psychological mechanism linking gratitude to life satisfaction. Although gratitude was positively associated with life satisfaction, its direct effect became non-significant after hope was included in the mediation model, suggesting that gratitude enhances life satisfaction primarily by fostering hope rather than through a direct pathway. This finding demonstrates that hope fully mediates the relationship between gratitude and life satisfaction among students.

The positive association between gratitude and hope suggests that students who are more grateful are more likely to develop stronger motivation and greater confidence in achieving their future goals. Although gratitude explained only a modest proportion of the variance in hope, the findings imply that hope is also influenced by other psychological and environmental factors, such as self-esteem, social support, and life experiences [33], [43], [48]. These factors may work together to shape students' beliefs about their ability to pursue meaningful goals and overcome challenges.

Theoretically, this relationship can be explained through the perspective of positive psychology and Hope Theory [48], which conceptualizes hope as consisting of two components: agency, referring to the motivation to achieve goals, and pathways, referring to the perceived ability to generate strategies for reaching those goals. Gratitude encourages individuals to interpret life experiences more positively, appreciate available resources, and recognize opportunities despite difficulties [49]. Such positive cognitive appraisal strengthens agency and pathways thinking, enabling students to maintain motivation and identify alternative strategies when facing obstacles. Consequently, gratitude contributes to the development of hope, which subsequently enhances life satisfaction [33], [43], [48].

The present findings are consistent with previous studies reporting that gratitude is positively associated with hope. Zhou et al. [33] who demonstrated a positive relationship between gratitude and hope. Gratitude-based interventions, such as counting blessings, have been shown to improve subjective well-being [49]. Strengthening gratitude has also been shown to increase hope, which impacts life satisfaction [12]. Research by You et al. [36] further supports these findings by demonstrating that gratitude and hope act as mediators in helping students adapt to difficult life experiences.

Hope also emerged as a significant predictor of life satisfaction and explained a larger proportion of the variance in life satisfaction than gratitude. This finding suggests that cognitive-motivational processes play a more substantial role than positive emotions alone in shaping students' evaluations of their lives. Nevertheless, life satisfaction is influenced by multiple factors beyond hope, including social support, family relationships, psychological well-being, life experiences, and the broader social environment [1], [50]. Theoretically, these results align with Snyder's [48]. Hope Theory, which states that hope consists of two main components: agency and pathways. Agency reflects the motivational drive to achieve goals, while pathways relate to an individual's ability to devise strategies to achieve them. The combination of these two components makes hope a source of cognitive-motivational strength that enables individuals to have not only desires but also a clear direction in life.

In the context of Student, the existence of hope becomes very important because this phase is marked by various developmental demands, both from academic and social aspects, as well as identity formation [51], [52]. Teenagers with high hopes tend to be able to set clear life goals, maintain motivation, and find alternative solutions when faced with obstacles. This helps them remain adaptive in the face of stress, enabling them to maintain a more positive evaluation of their lives.

These findings suggest that hope acts not only as a positive emotion but also as a cognitive mechanism that provides direction and meaning to students' lives. This explains why hope contributed more than gratitude in this study. While gratitude helps individuals see the positive side of life, without hope, they may not have the drive to move toward a better future. Hope serves as a key driver, translating positive psychological states into more stable life satisfaction. The results of this study are also supported by various empirical studies showing that hope has a positive relationship with life satisfaction. Students with high levels of hope tend to have better subjective well-being and higher levels of happiness [53], [54]. Hope also functions as a protective factor that helps students reduce the negative impact of psychological and social pressures, so that they are able to maintain life satisfaction [42], [44]. Overall, the results of this study confirm that hope is a key factor in increasing life satisfaction among students in Yogyakarta.

The results of the study indicate that gratitude has a positive and significant influence on life satisfaction among students in the Special Region of Yogyakarta. This finding indicates that the higher the level of gratitude in students, the higher their level of life satisfaction. The coefficient of determination (R^2) value indicates that the contribution of gratitude in explaining variations in life satisfaction is relatively small compared to other factors outside the study. This finding indicates that the hypothesis stating that there is an influence of gratitude on life satisfaction is acceptable, although its contribution is not as large as other variables. This relatively small contribution indicates that life satisfaction in students is not only influenced by gratitude, but also by other factors, such as hope, social support, family relationships, psychological conditions, and life experiences that also shape an individual's evaluation of the quality of their life [1], [33], [50].

Theoretically, these results align with the concept of gratitude from a positive psychology perspective proposed by Emmons and McCullough [55] who stated that gratitude is a positive emotion that plays a role in improving well-being by strengthening social relationships and fostering feelings of satisfaction with life. Individuals who exhibit gratitude tend to be more appreciative of life experiences, interpret positive aspects, and reduce their focus on shortcomings, thus forming a more positive evaluation of their lives. In the context of Student, gratitude serves as a source of positive emotions that help individuals cope with various developmental pressures. Students with high levels of gratitude tend to be better able to see the positive side of life experiences, thus less easily trapped by negative emotions. This condition supports the formation of greater life satisfaction, although its influence is not as strong as cognitive factors such as hope. This finding aligns with research showing that individuals with high levels of hope tend to be more grateful, which in turn impacts increased life satisfaction [33], [43], [56], thus showing a close relationship between gratitude, hope, and life satisfaction.

The results of this study are also supported by various empirical studies showing that gratitude has a positive relationship with life satisfaction in students. Gratitude is known to increase positive affect and decrease negative emotions, thereby strengthening positive evaluations of life [36], [37] Affective Mediators of the Influence of Gratitude on Life Satisfaction in Late Adolescence. Students with high levels of gratitude also tend to have better social support and fewer emotional difficulties, which ultimately contribute to increased life satisfaction [36]. The influence of gratitude on life satisfaction also occurs through various psychological mechanisms. Gratitude can improve the quality of interpersonal relationships, including relationships with parents, which ultimately contributes to life satisfaction [9]. Gratitude is also associated with increased mindfulness, self-esteem, and emotional well-being, which indirectly strengthen life satisfaction [33], [34]. These findings suggest that the influence of gratitude is not always direct, but often operates through more complex psychological pathways.

The findings of this study also indicate that gratitude contributes relatively less to life satisfaction than other variables, such as hope. This indicates that in students, positive emotions such as gratitude are not entirely sufficient to establish stable life satisfaction without the support of other, more cognitive and motivational factors. Overall, the results of this study confirm that gratitude is an important factor in increasing life satisfaction in students, although its contribution is not dominant. The results of this study indicate a significant indirect effect between gratitude and life satisfaction through hope, with a confidence interval (CI) that does not cross zero. This finding indicates that hope acts as a significant mediator in the relationship between gratitude and life satisfaction among students in the Special Region of Yogyakarta. This mediating role suggests that gratitude does not directly increase life satisfaction but first forms hope, which then contributes to increased life satisfaction.

This condition can be influenced by the developmental characteristics of students who are in the phase of forming identity, life goals, and future orientation [57]. Cultural factors can also play a role, especially in the context of Indonesian society, which tends to be collectivist, where gratitude is often related to the meaning of social relations, family support, and shared values that can strengthen hope for the future and ultimately increase

life satisfaction [58], [59]. These findings suggest that the relationship between gratitude and life satisfaction in students is influenced not only by emotional factors, but also by cognitive processes, development, and the sociocultural context that shapes expectations.

The direct effect value indicates that the direct influence of gratitude on life satisfaction becomes insignificant after the hope variable is included in the model. This finding suggests that the relationship between gratitude and life satisfaction does not occur directly, but rather entirely through hope as a mediator (full mediation). The total effect value indicates that gratitude still has an influence on life satisfaction, but this influence is largely channeled through hope. The very high percentage of mediation further confirms that gratitude's contribution to life satisfaction operates almost entirely through increased hope. This finding can be explained through McCullough et al [60] theory of gratitude, which states that gratitude is a positive emotion that encourages individuals to interpret life experiences more positively and strengthen social relationships. In this context, gratitude does not directly increase life satisfaction but first forms a more constructive perspective on life. This positive perspective then becomes the basis for hope for the future.

Based on Snyder's Hope Theory [40], hope is a cognitive system consisting of agency and pathways, namely the belief in achieving goals and the ability to design strategies to achieve them. Gratitude, which has shaped positive emotions and cognitions, will encourage individuals to have clearer goals, more focused strategies, and stronger motivation. Hope becomes a psychological mechanism that translates gratitude into a concrete future orientation. Within the framework of Diener's Subjective Well-Being Theory (1985; 2008), life satisfaction is an individual's cognitive evaluation of the overall quality of their life. This evaluation is influenced not only by positive emotions but also by how an individual interprets life experiences and views their future. Hope is a crucial factor because it provides direction, purpose, and confidence in the future, ultimately enhancing life satisfaction.

The results of this study are also supported by various empirical findings indicating that hope is an important mediator in the relationship between gratitude and life satisfaction. Zhou et al. [33] and Cui [43] found that gratitude increases life satisfaction through hope, as well as through other mechanisms such as social support and self-esteem. Froh et al. [49] and Barkauskienė et al [12] also showed that gratitude-based interventions can increase hope, which in turn impacts subjective well-being. Psychologically, when students experience gratitude, they tend to be better able to recognize positive experiences, appreciate the support they receive, and see opportunities in every situation [36], [49]. This condition encourages the formation of hope, namely the belief that goals can be achieved through proper planning and effort [61]. Students with high levels of hope tend to have a clear direction, strategies for achieving them, and motivation to continue working, resulting in a more optimal level of life satisfaction [41], [42]. The results of this study confirm that gratitude contributes to increased life satisfaction in students, but this influence is almost entirely channeled through hope. Hope is a key mechanism explaining how positive emotions like gratitude can translate into life satisfaction. These findings suggest that improving adolescent well-being requires more than just cultivating gratitude; it also requires strengthening hope, particularly in helping students develop life goals, achievement strategies, and confidence in the future. Overall, these findings confirm that gratitude is a crucial factor in increasing hope in students. Gratitude not only serves as a positive emotion but also as a psychological foundation that forms a more optimistic future orientation, thus helping students face developmental challenges more adaptively.

The findings regarding the effect of gratitude on hope align with Hope Theory (Snyder, 2000), which explains that hope consists of agency (motivation to achieve goals) and pathways (the ability to find ways to achieve goals). Gratitude helps individuals interpret life experiences more positively, thereby increasing confidence in their ability to achieve goals. The results of this study are also consistent with research by Zhou et al. [33] and Cui [43] which showed that individuals with high levels of gratitude tend to have better hope. During Student, which is characterized by various developmental demands, such as the search for identity, academic pressure, and social change, gratitude can be a psychological resource that helps build a more optimistic future orientation.

The results also showed that hope is a stronger predictor of life satisfaction than gratitude. This finding supports Snyder's [48] view that hope is a cognitive-motivational mechanism that drives individuals to set goals, maintain motivation, and find strategies when facing obstacles. Students with high hope tend to be more adaptive in facing developmental challenges, resulting in more positive life evaluations. These results align with previous studies showing that hope is positively related to life satisfaction and psychological well-being in students [41], [44], [53]. Although gratitude significantly influences life satisfaction, its direct contribution is relatively small compared to the indirect effect through hope. After hope was included in the model, the direct effect of gratitude on life satisfaction became insignificant. This finding indicates that hope is a key psychological mechanism explaining how gratitude enhances life satisfaction. These results are consistent with research by Zhou et al. [33], Cui [43], and You et al. [36], which showed that the relationship between gratitude and subjective well-being often operates through psychological mediators, such as hope, social support, and self-esteem. Therefore, gratitude not only generates positive emotions but also builds confidence in the future, which ultimately increases life satisfaction.

The findings of this study have practical implications for efforts to improve adolescent psychological well-being. Intervention programs should not only cultivate gratitude through exercises such as gratitude journaling or counting blessings, but also strengthen hope through activities that help students set goals, develop achievement strategies, and maintain motivation. Approaches that integrate the development of gratitude and hope are expected to be more effective in improving life satisfaction than interventions that focus solely on one aspect. These findings also expand the empirical evidence regarding the psychological mechanisms underlying adolescent well-being, particularly in the Indonesian cultural context. This study has several limitations. The distribution of respondents was dominated by women, mostly in the 16–17 year age range, and predominantly from Sleman Regency. Furthermore, the use of accidental sampling techniques limits the generalizability of the study results. Future research is recommended to use probability sampling techniques, involving a more proportional distribution of respondents by gender, age, and region, and to examine other psychological variables, such as social support, self-esteem, or resilience, which could potentially influence adolescent life satisfaction.

4. CONCLUSION

This study examined the effect of gratitude on life satisfaction, with hope serving as a mediator among students. The findings demonstrated that gratitude positively influenced hope, hope positively influenced life satisfaction, and hope fully mediated the relationship between gratitude and life satisfaction. These results indicate that gratitude contributes to students' life satisfaction primarily by strengthening hope. This study extends the application of Hope Theory by providing empirical evidence that hope functions as a key psychological mechanism linking gratitude and life satisfaction among Indonesian students. The findings contribute to the positive psychology literature by clarifying how gratitude promotes life satisfaction through hope rather than through a direct effect. Practically, the findings suggest that programs aimed at improving students' life satisfaction should integrate gratitude- and hope-based interventions, particularly those that encourage goal setting, strategic planning, and sustained motivation. Future research is recommended to employ longitudinal or experimental designs, use probability sampling techniques to improve generalizability, and examine additional psychological factors, such as resilience, self-esteem, and social support, that may influence students' life satisfaction.

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AUTHOR CONTRIBUTIONS

Conceptualization, NT and KNF; Methodology, NT; Software, NT; Validation, KNF, H., and HA; Formal Analysis, NT; Investigation, NT; Resources, NT; Data Curation, NT; Writing – Original Draft Preparation, NT; Writing – Review & Editing, KNF, H., and HA; Visualization, NT; Supervision, KNF, H., and HA; Project Administration, NT; Funding Acquisition, Not applicable.

CONFLICTS OF INTEREST

The author(s) declare no conflict of interest.

INFORMED CONSENT STATEMENT

Informed consent was obtained from all participants involved in the study. Before completing the questionnaire, participants received a detailed explanation of the study objectives, procedures, potential risks, benefits, and their rights as research participants. Participation was voluntary, and all participants provided informed consent prior to data collection. For participants who were minors, the study was conducted in accordance with the applicable institutional ethical requirements. All images in this article have been authorized and are the property of the authors.

USE OF ARTIFICIAL INTELLIGENCE (AI)-ASSISTED TECHNOLOGY

The authors declare that no artificial intelligence (AI) tools were used in the generation, analysis, or writing of this manuscript. All aspects of the research, including data collection, interpretation, and manuscript preparation, were carried out entirely by the authors without the assistance of AI-based technologies.

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