

The Relationship Between Emotional Regulation and Patterns of Loneliness Among Senior College Students in Medan Using a Sentiment Analysis Algorithm

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Abstract

Senior college students face various academic demands, particularly the writing of their theses, which can trigger negative emotions such as stress, anxiety, and frustration. Emotional regulation skills are essential for adaptively managing emotional experiences, while difficulties in regulating emotions can increase the risk of loneliness. Loneliness arises from the gap between expected and actual social relationships. Previous research has generally focused on young adults in general and has not specifically examined senior students in Medan from various universities who are currently completing their theses. This study fills that gap by examining the relationship between emotional regulation and loneliness in this local context as a novel contribution. The purpose of this study is to determine the profile of emotional regulation, the profile of loneliness, and the relationship between the two among senior students in Medan. This study contributes theoretically to the advancement of psychology and practically to students, universities, and future researchers. The study's limitations include generalizability restricted to the city of Medan, a correlational design, the use of self-report measures, and the examination of only two variables. The method used was a quantitative correlational study involving 355 respondents selected through purposive sampling. The instruments, the Emotional Regulation Scale and the UCLA Loneliness Scale Version 3 were analyzed using Spearman's Rho. The results indicate that emotional regulation tends to be high and loneliness is moderate, and there is a significant negative correlation of moderate strength ($r = -0.425$; $p < 0.001$). Emotional regulation accounts for 18% of the variance in loneliness. These findings support the theories of Gross, Perlman, and Peplau, as well as Weiss. From a practical perspective, there is a need to improve students' emotional regulation skills and to implement psychological counseling programs at universities.

Introduction

Senior students are in a transitional phase toward early adulthood, marked by various academic demands, particularly the process of writing and completing their thesis. Academic pressure, repeated revisions, concerns about graduation, and uncertainty about the future often give rise to negative emotions such as stress, anxiety, frustration, and disappointment. In such situations, the ability to regulate emotions becomes crucial because it allows individuals to recognize, evaluate, and modify their emotional experiences to align with the demands of the situation (Ma et al., 2025). Students who have difficulty regulating their emotions tend to withdraw from their social environment or view situations negatively, thereby increasing their risk of experiencing loneliness. Loneliness arises when there is a gap between an individual's expected social relationships and the social relationships they actually have (Perlman & Peplau, 1981). Loneliness is not only related to the number of social relationships, but also to psychological states and the way individuals manage their emotional experiences (Cricenti et al., 2022). For senior students, reduced interaction with peers due to their focus on completing their final projects can increase the likelihood of feelings of loneliness, even though they are still on campus. The circumstances of senior students in Medan, who come from various public and private universities with diverse faculty and academic program backgrounds provide a relevant context for understanding the dynamics of emotion regulation and loneliness during the final phase of their studies. Therefore, research on the relationship between emotion regulation and loneliness among senior students is needed to deepen our understanding of the psychological factors that play a role in coping with academic pressure during the final years of college.

The objectives of this study are to examine the patterns of emotional regulation among senior college students in Medan, to examine the patterns of loneliness among senior college students in Medan, and to

examine the relationship between emotional regulation and loneliness among senior college students in Medan. This study is expected to provide both theoretical and practical benefits. Theoretically, this study contributes to the development of psychology, particularly in understanding the relationship between emotional regulation and loneliness among senior college students. Furthermore, this study enriches the theoretical literature on the psychological dynamics of students nearing the end of their studies and can serve as a foundation for future research related to emotional regulation, loneliness, and students' psychological well-being (Özcan, S., & Sakız, 2025). From a practical perspective, for seniors, this study is expected to raise awareness of the importance of emotional regulation skills in coping with academic stress and reducing the risk of loneliness. For universities and educational institutions, the results of this study can be used as a basis for designing psychological support programs, counseling, or activities that promote the mental health of senior students. Meanwhile, for future researchers, this study can serve as a reference and guide for developing further research on the factors that influence loneliness and strategies for improving emotional regulation among students (Mania, S., malik Ibrahim, M., & Dewi, 2024).

This study has several limitations that must be acknowledged. The study involved only senior college students in the city of Medan; therefore, the findings cannot be broadly generalized to students in other regions or at different educational levels. The study design was correlational, so it could only demonstrate the existence of a relationship between variables and could not explain a cause-and-effect relationship between emotional regulation and loneliness (Munguía et al., 2021). Data collection was conducted using self-report questionnaires, both offline and online, which may have led to response bias or dishonesty in completing the questionnaires. Furthermore, this study examined only two main variables; emotional regulation and loneliness, while other factors

that could potentially influence loneliness among senior undergraduates were not included. The characteristics of the respondents, who were predominantly students from a specific cohort and had an unbalanced gender distribution may also limit the overall representativeness of the sample. The study was conducted over a relatively short period, from April to May, so the dynamic psychological conditions of students throughout the semester may not have been fully represented.

Previous research on the relationship between emotion regulation and loneliness has largely focused on the general early-adult population and has not specifically examined senior college students who are facing the thesis completion phase and its unique academic pressures. Previous studies have tended not to pay special attention to the context of students in Medan who come from various public and private universities with diverse faculty and academic program backgrounds. Previous studies have emphasized general relationships, while the dynamics of emotional regulation and loneliness during the final phase of study, which are associated with reduced social interaction, thesis revisions, concerns about graduation, and uncertainty about the future have rarely been examined in depth. There remains a lack of local research linking emotion regulation theory and loneliness theory in the context of senior college students in Indonesia, particularly in the North Sumatra region. Few previous studies have focused on senior college students as the primary subjects in understanding how emotion regulation abilities play a role in coping with the risk of loneliness during the final stages of their studies (Fortuna & Nurmina, 2024).

Method

This study employs a quantitative approach using a correlational method. A quantitative approach was chosen because the research data consists of numerical scores that are statistically analyzed to test the hypotheses. According to (Costescu et al.,

2023) conducted on a specific population or sample using research instruments and statistical analysis. A correlational method was used to determine the direction and strength of the relationship between emotional regulation and loneliness among senior college students in Medan without manipulating the research variables (Tarigan & Apsari, 2022).

This study involves two variables: emotional regulation as the independent variable (X) and loneliness as the dependent variable (Y). Emotional regulation is posited as the variable suspected to be associated with high or low levels of loneliness among senior college students.

Emotional regulation is the ability of senior undergraduates to recognize, evaluate, control, and modify their emotional responses when facing academic pressure, particularly during the thesis writing process. Emotional regulation was measured using a scale comprising the aspects of emotional monitoring, emotional evaluation, and emotional modification. The higher the score obtained, the better the students' emotional regulation ability (Ema Fitriya et al., 2025).

Loneliness is an unpleasant emotional experience resulting from a gap between students' expected social relationships and their actual social relationships. Loneliness is measured using the UCLA Loneliness Scale Version 3, developed by (Yogman et al., 2018) with the aspects of trait loneliness, social desirability, and depression-related loneliness. The higher the score obtained, the higher the level of loneliness experienced by the students (Özdoğan, 2021).

The subjects in this study were male and female students in their final year, currently writing their theses, and enrolled at various universities in the city of Medan. These characteristics were selected because final-year students face various academic demands and changes in social interactions that may be related to their ability to regulate emotions and their experiences of loneliness (Al Awwali & Suyadi, 2024).

The study population consisted of students at public and private universities in

Medan, totaling approximately 282,794 individuals. The sample size was determined based on the Isaac and Michael table with a 5% margin of error, resulting in a minimum sample size of 348 respondents. In practice, data were successfully collected and analyzed from 355 respondents. The sampling technique used was purposive sampling, which involves selecting subjects based on criteria predetermined by the researcher. This technique was used to ensure that the respondents aligned with the research objectives, namely senior undergraduate students currently writing their theses and attending college in the city of Medan.

Research data were collected using psychological scales distributed via Google Forms. The research instruments consisted of a 22-item emotional regulation scale and a 20-item UCLA Loneliness Scale Version 3. Both instruments used a Likert scale with four response options (Kindness et al., 2024).

For favorable statements, "Strongly Agree" was scored as 4, "Agree" as 3, "Disagree" as 2, and "Strongly Disagree" as 1. For unfavorable statements, scoring was reversed, namely 1, 2, 3, and 4. The total score was obtained by summing all item scores on each scale. Mathematically, the total score can be expressed as:

$$X = \sum_{i=1}^n X_i \quad (1)$$

Let (X) denote the respondent's total score, (X_i) denote the score on each item, and (n) denote the number of items in the scale.

Before the study was conducted, both instruments were pilot-tested on 62 senior students at HKBP Nommensen University from August 2 to 8, 2023. The pilot test results showed that all 22 items on the emotional regulation scale and all 20 items on the loneliness scale had a minimum item correlation coefficient of 0.30 and were therefore deemed valid (Kořar & Kořar, 2025).

Item validity was calculated using the product-moment correlation formula:

$$r_{xy} = \frac{N \sum XY - (\sum X)(\sum Y)}{\sqrt{[N \sum X^2 - (\sum X)^2][N \sum Y^2 - (\sum Y)^2]}} \quad (2)$$

The notation (r_{xy}) represents the item-total correlation coefficient, (X) represents the item score, (Y) represents the total score, and (N) represents the number of test subjects. The reliability of the instrument was calculated using Cronbach's alpha coefficient with the formula:

$$\alpha = \frac{k}{k-1} \left(1 - \frac{\sum \sigma_i^2}{\sigma_t^2} \right) \quad (3)$$

The notation (α) represents the reliability coefficient, (k) represents the number of items, ($\sum \sigma_i^2$) represents the sum of the variances of each item, and (σ_t^2) represents the variance of the total score. The test results showed that the reliability coefficient for the emotional regulation scale was 0.931 and for the loneliness scale was 0.943. Both values were greater than 0.60, so the instruments were deemed reliable and suitable for use.

Data collection for the study was conducted from April 30 to May 27, 2024, via WhatsApp, Instagram, and TikTok. Each email account was allowed to complete the questionnaire only once to prevent duplicate entries. The collected data was then checked, scored, categorized, and analyzed using SPSS for Windows (Tranggono, 2022).

Data analysis consisted of descriptive analysis and inferential analysis. Descriptive analysis was used to provide an overview of the respondents' characteristics as well as the categories of emotional regulation and loneliness scores. Inferential analysis was used to test the relationship between the two variables (Rahmahdianti & Rusli, 2020).

Prior to hypothesis testing, normality tests were conducted using the one-sample Kolmogorov-Smirnov test and a linearity test (İme & Ümmet, 2024). Data were considered normally distributed if the significance value was greater than 0.05, while the relationship between the two variables was considered linear if the significance value for Deviation

from Linearity was greater than 0.05 (Stratman & Youssef-Morgan, 2019).

The results of the normality test showed that one of the variables was not normally distributed. Therefore, hypothesis testing was performed using Spearman's Rho nonparametric correlation. The formula for Spearman's correlation is:

$$r_s = 1 - \frac{6 \sum d_i^2}{n(n^2 - 1)} \quad (4)$$

(r_s) represents the Spearman correlation coefficient, (d_i) represents the rank difference between the emotional regulation variable and the loneliness variable, and (n) represents the number of respondents. The research hypothesis is accepted if the significance value is less than 0.05 and rejected if the significance value is greater than 0.05. A negative correlation coefficient indicates that an increase in emotional regulation is associated with a decrease in loneliness, while the absolute value of the coefficient indicates the strength of the relationship between the two variables.

Result and Discussion

The study was conducted from April 30 to May 27, both in person and online, until all data had been collected. The study participants consisted of 355 senior undergraduate students in the city of Medan. Before conducting further analysis of the variables of emotion regulation and loneliness, the researchers first described the respondents' characteristics based on gender, age, university, faculty, major, and student ID number. This demographic overview was provided to understand the context of the sample and assess the representativeness of the research findings.

Based on gender, the majority of participants were female, totaling 286 individuals or 80.5 percent, while males numbered 69 individuals or 19.5 percent. This predominance of female participation indicates a higher level of engagement among female students in completing the questionnaire, although both men and women contributed to describing the state of emotional

regulation and loneliness among senior students in Medan.

In terms of age, the respondents were between 20 and 25 years old, which aligns with the characteristics of senior college students in early adulthood. The 22-year-old age group was the largest, with 138 people (38.9 percent), followed by the 21-year-old age group with 130 people (36.6 percent), and the 23-year-old age group with 59 people (16.6 percent). There were 14 respondents aged 20 (4 percent), 11 aged 24 (3 percent), and only 3 aged 25 (0.9 percent). The concentration of respondents in the 21–22 age group reinforces that the sample reflects a population of students nearing the end of their studies (Adu, 2023).

The respondents' university affiliations were also quite diverse, encompassing both public and private universities in the city of Medan. Medan State University contributed the largest number with 35 respondents (9.9 percent), followed by the Indonesian Methodist University with 26 respondents (7.4 percent), Sari Mutiara University with 24 respondents (6.7 percent), and the University of North Sumatra with 23 respondents (6.5 percent). Muhammadiyah University of North Sumatra, UIN North Sumatra, Mikroskil, HKBP Nommensen, and Santo Thomas Catholic University also made significant contributions, while several other universities had smaller numbers of respondents (Ifdil et al., 2020). This diversity in university origins indicates that the sample is not concentrated in a single institution, thereby providing a more representative picture of the conditions of final-year students in Medan (Ryff & Singer, 2018).

The respondents' faculty backgrounds also reflect the diversity of academic disciplines. The Faculty of Law had the largest number of respondents with 37 (10.4 percent), followed by the Faculty of Economics and Business with 33 (9.3 percent) and the Faculty of Teacher Training and Education with 31 (8.7 percent). The Faculties of Agriculture, Computer Science, Social and Political Sciences, Languages and Arts, Pharmacy, Natural Sciences, and Engineering were also

represented in significant numbers. The presence of respondents from the social sciences, education, health, agriculture, and technology fields indicates that the sample covers a broad spectrum of academic disciplines, allowing findings on emotional regulation and loneliness to be viewed in a more comprehensive context.

At the program level, Information Systems ranked first with 43 respondents (12.1 percent), followed by Elementary School Teacher Education with 31 respondents (8.7 percent) and Law with 28 respondents (7.9 percent). The Computer Science, Management, Accounting, English Education, and Pharmacy programs also had a significant number of respondents, while many other programs were represented in smaller numbers. This pattern shows that respondents did not come solely from specific fields of study but were spread across various majors, reflecting the diversity of academic interests among senior students (Dani & Aryono, 2019).

Based on student records, nearly all respondents were from the class of 2022, 341 students, or 96.1 percent while the class of 2021 comprised only 14 students (3.9 percent). The predominance of the class of 2022 indicates that the majority of participants were students in the final stages of their studies during the research period (Park et al., 2020).

Based on the results of the descriptive analysis, the empirical mean score for emotional regulation (64.06) was higher than the hypothetical mean (55), with the empirical standard deviation also being slightly larger. This finding suggests that senior students in Medan tend to have better emotional regulation abilities than theoretically assumed, although there was still variation in scores among the respondents. For the loneliness variable, the empirical mean (50.45) was only slightly above the hypothetical mean (50), but the standard deviation was much higher (15.07 compared to 10). This indicates that the respondents' levels of loneliness tended to be above theoretical assumptions, with greater variability (Garcia et al., 2023).

Based on the results of a study of 355 senior college students in Medan, the respondents' emotional regulation generally fell into the high category, comprising 173 individuals (48.7%), followed by the moderate category with 146 individuals (41.1%) and the low category with 36 individuals (10.1%). These findings indicate that the majority of respondents have been able to adaptively manage and control their emotional responses when facing academic demands and daily life challenges. Based on demographic characteristics, emotional regulation among male and female respondents showed relatively similar patterns, but there were variations based on age, university, faculty, major, and enrollment year (Dwiputra & Kusumiati, 2021).

As for the respondents' loneliness levels, the majority fell into the moderate category, namely 140 people (39.4%), followed by the low category with 124 people (34.9%) and the high category with 91 people (25.6%). This indicates that most students still experience feelings of loneliness to some extent, but not at a high level. The moderate category also tended to dominate based on age and enrollment year, although there were variations across universities, faculties, and majors (Tohitin & Qudsyi, 2025).

Based on the results of the descriptive analysis, the emotional regulation of senior college students in Medan across all aspects tends to fall into the moderate to high categories. In terms of emotion monitoring, 46.8% of respondents fell into the moderate category and 46.5% into the high category. This indicates that the majority of students are able to recognize and be aware of the emotions that arise when facing stress during the completion of their studies. In the aspect of emotion evaluation, the majority of respondents 50.4% fell into the moderate category, indicating that students are reasonably capable of understanding the causes of their emotions and assessing their appropriateness for the situations they face. Meanwhile, the aspect of emotion modification was also dominated by the moderate category at 52.7%. These findings

suggest that students are reasonably capable of managing their emotional responses but are not always consistent in transforming negative emotions into more adaptive responses (Ramadhan & Coralia, 2022).

The results of the analysis of the loneliness variable showed different patterns across each aspect. The trait loneliness aspect was dominated by the high category at 56.9%, while 43.1% fell into the moderate category, and no respondents were in the low category (Karsay et al., 2019). These results indicate that the majority of students tend to experience relatively persistent feelings of loneliness, isolation, and a lack of emotional closeness. Regarding social desirability, the largest proportion of respondents fell into the moderate category at 36.6%, followed by the low category at 35.8% and the high category at 27.6%. This suggests that students exhibit a fairly moderate tendency to maintain their self-image and adjust their responses to social expectations, meaning that feelings of loneliness are not always openly expressed. As for the depression aspect, the "low" category dominated at 41.4%, indicating that the feelings of loneliness experienced by most students have not yet developed into severe symptoms of depression, although 28.2% of respondents still fell into the "high" category.

Based on the results of the One-Sample Kolmogorov-Smirnov test, the emotional regulation variable obtained a significance value of 0.278, which is greater than 0.05; therefore, it is deemed to be normally distributed. Meanwhile, the loneliness variable obtained a significance value of 0.001, which is less than 0.05; therefore, it is deemed not to be normally distributed. The research data did not meet the assumption of normality because one of the variables was not normally distributed. Therefore, the relationship between emotional regulation and loneliness was tested using Spearman's Rho nonparametric correlation (Suomi et al., 2024).

The results of the linearity test showed a significance value for Deviation from Linearity of 0.489, which is greater than 0.05. These results indicate that there is no significant

deviation from a linear pattern. The relationship between emotional regulation and loneliness can be considered linear; thus, the assumption of linearity in this study has been met (Al-Saggaf & Nielsen, 2014).

Based on the results of the Spearman's Rho correlation test conducted on 355 out-of-town students, a correlation coefficient of -0.425 was obtained with a significance level of less than 0.001. These results indicate that there is a significant negative relationship of moderate strength between emotional regulation and loneliness. This means that the higher the emotional regulation ability of out-of-town students, the lower their level of perceived loneliness. Conversely, the lower a student's emotional regulation, the higher their level of loneliness. Therefore, the hypothesis stating that there is a relationship between emotional regulation and loneliness among out-of-town students at HKBP Nommensen University in Medan is accepted.

The coefficient of determination, obtained by squaring the correlation coefficient, is approximately 0.180 or 18%. This indicates that emotional regulation accounts for 18% of the variation in loneliness, while the remaining 82% is attributed to other factors not examined in this study (R. Akbar & Prapita, 2021).

Discussion

Based on the results of the Spearman's Rho correlation test, a correlation coefficient of -0.425 was obtained with a significance level of less than 0.001. The results indicate that there is a significant negative relationship of moderate strength between emotional regulation and loneliness. Thus, the research hypothesis is accepted. The direction of the negative relationship suggests that the higher the emotional regulation ability of senior students, the lower their perceived level of loneliness. Conversely, students with low emotional regulation tend to experience higher levels of loneliness.

This finding is consistent with Gross's theory, which explains that emotional regulation is an individual's ability to

recognize, evaluate, and modify emotional experiences to suit the demands of a situation (Quynh Ho & Nguyen, 2023). Students who are able to manage negative emotions, such as stress, anxiety, frustration, and disappointment during the thesis-writing process will be better able to cope with academic pressure in an adaptive manner. This ability can prevent students from withdrawing from their social environment or viewing the situations they face in a negative light, thereby reducing the risk of experiencing loneliness.

The results of this study can also be explained through the theory (Perlman & Peplau, 1981) which states that loneliness arises when there is a gap between an individual's expected social relationships and the social relationships they actually have. Senior college students can still feel lonely even when they are in a social environment if their relationships do not provide the emotional closeness they expect. This is supported by (Weiss, 1975) which explains that loneliness is not only related to the number of social relationships, but also to psychological conditions and the way individuals manage their emotional experiences.

The findings of this study are consistent with research (Nuriyanti & Nugraha, 2025) which found a significant association between emotion regulation and loneliness in early adulthood. The use of adaptive emotion regulation strategies, such as cognitive reappraisal, is associated with lower levels of loneliness, whereas the use of expressive suppression is associated with increased loneliness. These findings are also consistent with research (Syahputra & Affandi, 2024) which indicates a negative relationship between emotional regulation and loneliness. Individuals with good emotional regulation skills tend to be better able to reduce the psychological impact of experiences of loneliness (Subba, 2014).

Based on a comparison of hypothetical and empirical means, senior students' emotional regulation falls into the high category, while their loneliness tends to fall into the moderate category. This suggests that

although students have fairly good emotional regulation skills, they are still at risk of experiencing loneliness while completing their final projects. Academic pressure, thesis revisions, reduced interaction with peers, concerns about graduation, and uncertainty about the future can trigger feelings of loneliness (Hood et al., 2018). However, good emotional regulation helps students manage the impact of these pressures so that the loneliness they experience does not develop into a more severe condition (Wang et al., 2019).

The results of the categorization of emotional regulation aspects show that the ability to monitor emotions falls into the high category, while the ability to evaluate and modify emotions mostly falls into the moderate category (S. K. Akbar & Abdullah, 2021). This means that students are generally able to recognize the emotions they are feeling but still need to improve in evaluating and transforming negative emotions into more adaptive responses. Meanwhile, regarding the loneliness variable, the trait loneliness aspect showed the highest percentage in the high category (Berg & Peplau, 2020). This indicates that some students have a relatively persistent tendency to feel lonely when facing academic pressure and changes in social relationships.

Conclusion

Theoretically, this study demonstrates a significant negative correlation of moderate strength between emotional regulation and loneliness among senior college students in Medan. These findings support Gross's (1998, 2014) theory, which explains that the ability to regulate emotions helps individuals manage negative emotions adaptively, thereby reducing the risk of loneliness. The results also reinforce the theories of Perlman and Peplau (1981) and Weiss (1975), which state that loneliness is determined not only by the number of social relationships but also by psychological conditions and an individual's ability to manage emotional experiences. Furthermore, these findings align with previous studies (Nuraini & Satwika,

2023) which identified a negative relationship between emotional regulation and loneliness among young adults. Emotional regulation has been shown to act as a protective factor that helps senior college students cope with academic stress, although loneliness may still arise due to the gap between expected and actual social relationships.

In practical terms, senior students need to improve their emotional regulation skills, particularly in the areas of emotional evaluation and modification, so they can better manage academic stress and reduce the risk of loneliness while completing their thesis. Universities and educational institutions are advised to develop psychological support programs, emotional regulation training, and counseling services focused on the mental health of senior students. Students are also encouraged to be more proactive in maintaining the quality of their social relationships and emotional closeness with peers and their surrounding community, even though their primary focus is on completing their final thesis. For future researchers, it is recommended to examine other factors beyond emotional regulation that contribute to loneliness, given that a proportion of the variation remains unexplained in this study.

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Author Contributions

This article was written by two individuals, Hutahaeen, N.V.O. & Rosito, A.C who have read and approved the published version of this manuscript, Hutahaeen, N.V.O. & Rosito,

A.C designed the study and analyzed the data, while Hutahaeen, N.V.O. & Rosito, A.C performed the laboratory work. Hutahaeen, N.V.O. & Rosito, A.C, wrote the manuscript. They drafted the original manuscript, prepared the introduction, results, discussion, methodology, and conclusion. Hutahaeen, N.V.O. & Rosito, A.C also contributed ideas to the research process, data processing, translation into English, review, and editing. All members of the research team collaborated at every stage until this article was completed.

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Conflicts of Interest

This research is conducted to provide information to the public regarding the research that has been conducted so that it can be used for educational purposes. In addition, this research is used by researchers for lecturer performance loads and accreditation needs of study programmes and institutions.

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