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Quantitative Research Article

Emotion regulation as mediator between information and technological factors and self-esteem among nursing students: A structural equation model

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Keywords

Emotion regulation; Self-esteem; Nursing student; Model

Abstract

Background: Several factors influence nursing students' self-esteem. Emotion regulation is moderator between individual factors, social factors, information and technology and self-esteem.
Objective: The aim of this research was to analyze emotion regulation as moderator between individual factor, social factor, information and technology factor and self-esteem.
Methods: This study used quantitative with explanatory methods with a cross ectional design. The target population in this study were nursing students in Mojokerto Regency, Indonesia. Total sample in this study was 216 nursing students. The variable in the study were individual factor variables (X1), social factors (X2), and information technology factors (X3) on Self-esteem (Y) through the mediator emotion regulation (Z). Data were analyzed using the Structural Equation Modeling - Partial Least Square. It was used to analyze inner model (the effect between variables). We used a t-statistic value (t>1.96) and the direction was measured using path coefficient.
Results: Most of the respondents in this study were female students (83.3%), aged 18 to 21 years (91.2%). Emotion regulation was influenced by individual factors and information and technology factor (t>1.96). Emotion regulation was mediator between information technology and self-esteem (t: 7.327, Path coefficient: 0.544).
Conclusion: Effective emotion-regulation is essential for managing information and technology factors to enhance self-esteem among nursing students. By regulating social media exposure, improving social media literacy, and controlling access to social media, emotion-regulation can positively influence the development of self-esteem.to provide precise operational definitions, refine ambiguous concepts within a theory, and provide a more basic and deeper understanding of underlying caregiver strain in schizophrenic patients.

Introduction

The use of digital technology brings positive impacts, such as opportunities for creativity, improved communication, and more efficient problem-solving. However, it also has negative effects on psychosocial well-being, particularly in terms of low self-esteem. This is characterized by feelings of worthlessness, insecurity, lack of confidence, inferiority, and vulnerability (Strimbu & O'Connell, 2019).

Nursing students are among the largest groups of digital technology users, frequently accessing social media and being vulnerable to low self-esteem. A previous study found that 60% of teenagers who used social media never created videos, while 40% actively made videos. Among them, 52% felt confident using social media, while 48% lacked confidence. Additionally, 52% reported feeling ashamed or afraid of receiving negative comments, while 48% were unaffected by such comments (Islami et al., 2022). A preliminary study of 22 nursing students at Universitas Bina Sehat PPNI Mojokerto revealed that 17 students experienced situational low self-esteem, often comparing themselves to others when viewing social media content, such as photos of friends who appear more attractive, have luxurious lifestyles, or achieve higher accomplishments.

Several factors influence nursing students' self-esteem was recognition and acceptance by others (social factor). Self-esteem is shaped by the influence of important people in an individual's life, who provide the first social interactions (individual factor). Values and personal interpretation of experiences also affect self-esteem but is filtered through the individual's goals and values. Responses to evaluations. Individuals can reduce the impact of negative evaluations by rejecting others' rights to define their worth. Positive emotion-regulation is essential to improve self-esteem.

The theoretical foundation for the development of an emotion-regulation model is based on Leventhal's emotion-regulation model (Ogden, 2007). Leventhal's emotion-regulation model describes emotion-regulation as a process of managing emotions, thoughts, and behaviors to address challenges. This enables individuals, including students, to manipulate their thinking and actions to achieve goals, set targets, pursue objectives, and evaluate progress. Previous study mentioned that emotion regulation had effect on well-being, including self-esteem, by reducing negative emotions and enhancing adaptive emotional responses (Gross & John, 2003). Emotion-regulation is influenced by internal, external factors, and information technology. Internal factors include cognitive abilities, motivation, emotional stability, and self-efficacy (Ogden, 2007). External factors consist of social interactions and social support (Ogden, 2007). Meanwhile information technology is based on Goffman's theory. It is foundational in understanding how individuals present themselves strategically in both real-life and digital contexts. It bridges sociology, psychology, and marketing, making it highly relevant to self-branding discussions (Goffman, 2002).

Applying evidence-based to explore the relationship between emotion regulation, digital influences, and self-esteem among nursing students. A model helps health professionals assess self-esteem and create strategies

to support nursing students (Cohen & Wills, 1985). This study specifically focuses on nursing students, a population with unique vulnerabilities due to their developmental stage and educational stressors. This study also providing empirical evidence of the mediating role of emotion regulation to enhance students' self-esteem.

Based on this background, the aim of this research was to analyze emotion regulation as moderator between individual factor, social factor, information and technology factor and self-esteem.

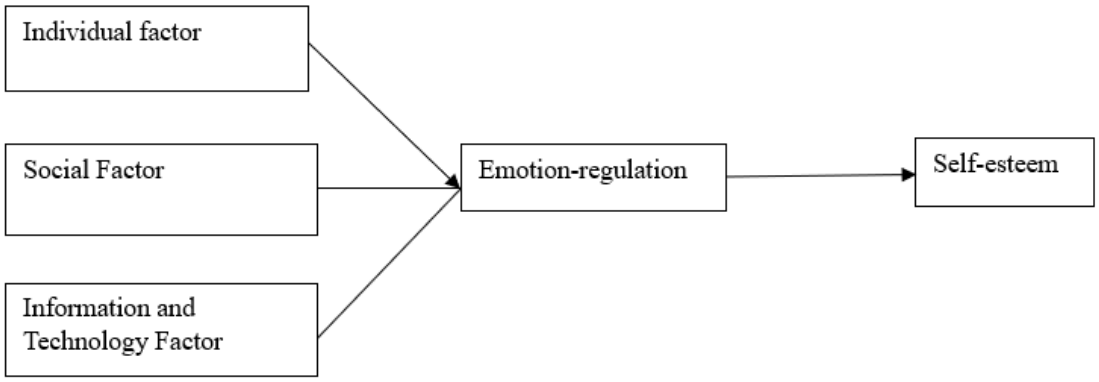

Figure 1. Factors that affecting self-esteem: tested (Ogden, 2007; Goffman, 1959)

Methods and Material

Research design

This study used quantitative with explanatory methods with a cross ectional design. The purpose of this study is to analyze the influence of individual factor variables (X1), social factors (X2), and information technology factors (X3) on Self-esteem (Y) through the mediator emotional response (Z).

Table 1. Observed variable

Variable	Indicator
Individual factor (X_1)	Experience
	Emotional stability
	Cognitive ability
	Motivation
	Self-efficacy
Social factor (X_2)	Social interaction
	Social support
	Community's acceptance

Information technology factor (X_3)	Social media exposure
	Social media knowledge
	Ease of access to social media
Emotion-regulation (Z)	Fear
	Anxiety
	Depression
Self Esteem (Y)	Power
	Significance
	Virtue
	Competence

Participants

The target population in this study were nursing students in Mojokerto Regency, Indonesia. The study was conducted in three school of nursing, namely Bina Sehat PPNI, Dian Husada, Majapahit. The sample used in this study was part of nursing students in Mojokerto Regency who were selected with the inclusion criteria: undergraduate nursing students residing in Mojokerto Regency, social media users, and willing to be respondents. The total sample was measured by multiplying the indicator by 5-10 respondents (Kline, 2023). This study had 18 indicators. Therefore, the minimum sample of this study was 90 respondents. Total sample in this study was 216 nursing students. We selected the university students using multistage random sampling.

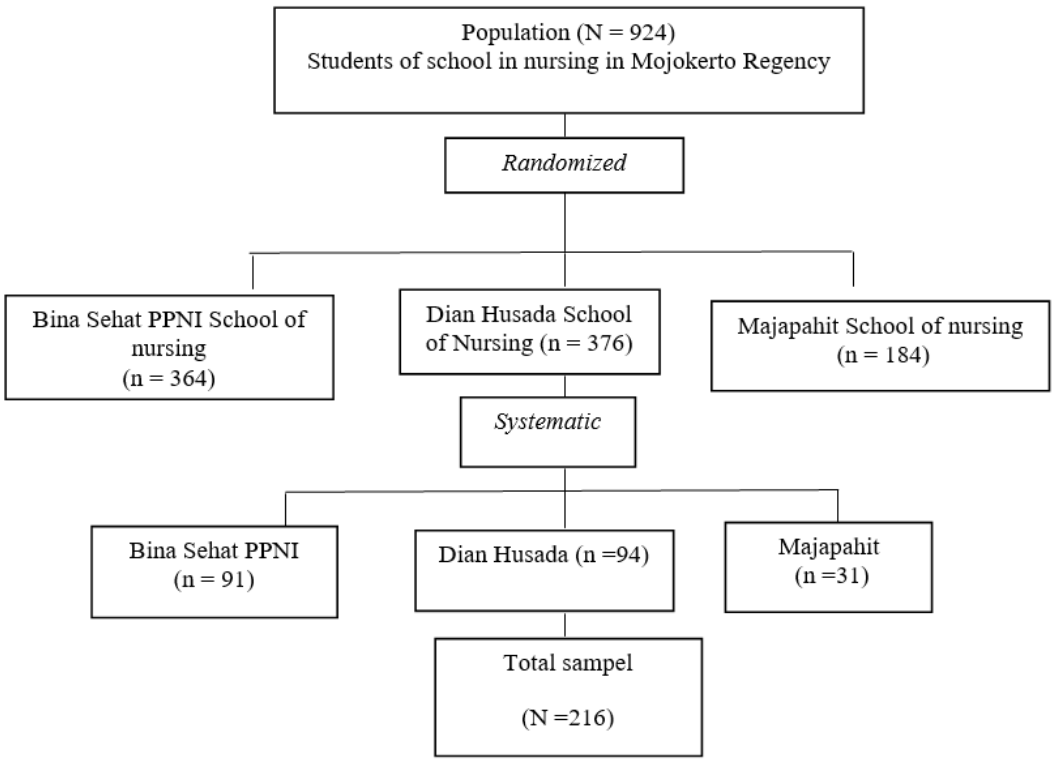

Figure 2. Flowchart of selected sample

Data collection

This research was granted by ethical clearance from the Faculty of Nursing, Universitas Airlangga with number 3111-KEPK. All of the participants agreed to join in this study and signed the informed consent. This study used a questionnaire as a data collection tool. The questionnaire was used to measure individual factor variables, social factors, information and technology factors, emotional response, and self-esteem. The collection was conducted using google form.

Instruments

The questionnaire scale used a Likert scale with a scale of 1 to 5 (Strongly disagree to Strongly Agree). All questionnaires were tested using content validity and corrected item-total correlation. It fulfilled the requirements ($r > 0.5$). Further, the questionnaires were also tested using reliability, and the results of the Cronbach alpha were > 0.7.

The study utilized self-report questionnaires to collect data on individual factors, social factors, information and technology, emotional response, and self-esteem. Individual factors included age, gender, education, and income. Age was categorized into early and late adolescents, gender was classified as male or female, education was measured in years of study, and income was assessed using the regional minimum wage.

Social factor, adapted from Cohen's framework (Cohen & Wills, 1985), was defined as the feedback individuals receive through being loved, cared for, appreciated, respected, and included in communication networks. This construct was measured using two key indicators: appraisal support and tangible support. The scores were categorized into three levels: poor (12–24), fair (25–37), and good (38–48). The questionnaire demonstrated excellent reliability, with a Cronbach's alpha of 0.951 (Appendix 1).

Information and technology exposure referred to social media use, modified from Baria's research (Baria, 2021). The indicators included the extent of social media use, frequency of usage, and duration. Scores were divided into poor (15–35), fair (36–56), and good (57–75). The reliability of this questionnaire was strong, with a Cronbach's alpha of 0.876 (Appendix 2).

Emotion regulation had several indicators such as fear of missiong out (FOMO), anxiety, and depression. Fear is measured to identify feelings of worry, fear of missing out on trends, and a persistent desire to follow the latest updates. This measurement uses a closed-ended questionnaire adapted from Przybylski, A. K., Murayama, K., DeHaan, C. R., and Gladwell, V. (2013) (Przybylski et al., 2013). It had 10 items. Scoring 1 (not at all true of me), 2 (slightly true of me), 3(moderately true of me), 4 (very true of me). Respondents select one of the provided answers, and their responses are categorized into three levels: low (scores between 10-23), medium (scores between 24-37), and high (scores between 38-50) (appendix 3.1). Anxiety is assessed to evaluate intense, excessive, and persistent worry or fear related to everyday situations. This measurement is conducted using a closed-ended questionnaire adapted from the Depression Anxiety Stress Scales 21 (DASS-21). Respondents select one of the available answers, and their responses are categorized into low (scores between 7-16), medium (scores between 17-25), and high (scores between 26-35) (Osman et al., 2012). Depression is measured to assess mood, which refers to a prolonged emotional condition that influences a person's thinking, feelings, and behavior. This measurement also uses a closed-ended questionnaire adapted from the Depression Anxiety Stress Scales 21 (DASS-21). Respondents choose one of the available answers, and their responses are categorized into low (scores between 7-16), medium (scores between 17-25), and high (scores between 26-35) (Osman et al., 2012) (appendix 3.2).

Self-esteem was assessed using a framework modified from Coopersmith's theory (Coopersmith, 1981), focusing on indicators such as power, significance, virtue, and competence. This questionnaire measured individuals' ability to influence others, take initiative, understand themselves, behave according to standards, and achieve tasks aligned with their goals. It also demonstrated good reliability, with a Cronbach's alpha of 0.832 (Appendix 4).

Data analyse

Data were analyzed using the Structural Equation Modeling - Partial Least Square (SEM-PLS). It was used to analyze inner model (the effect between variables). We used a t-statistic value (t>1.96) and the direction was measured using path coefficient.

Results

Characteristic of Responden

Most of the respondents in this study were female students (83.3%), aged 18 to 21 years (91.2%), Muslim (96.8%), and earning a monthly income below the minimum wage (55.6%). Table 2 provides a detailed of the respondents' characteristics, including gender, age, religion, institution, and monthly income.

Tabel 2. Characteristic of Respondent

Characteristic	Total	Percentage
Gender		
Male	36	16.7%
Female	180	83.3%
Age (Year)		
18 – 21	197	91.2%
22 – 25	19	8.8%
Religion		
Islam	209	96.8%
Christian	3	1.4%
Catholic	4	1.6%
School		
Universitas Bina Sehat PPNI Mojokerto	91	42.1%
STIKes Majapahit	31	14.4%
STIKes Dian Husada Mojokerto	94	43.5%

Outer Model

The convergent validity test results indicate that the cognitive ability indicator in the individual factor variable has a loading factor below 0.5 and a significance value above 0.05. As a result, this indicator was excluded from the analysis. Additionally, the AVE values for all four variables are above 0.5, indicating good discriminant validity for each variable. The composite reliability test shows that all constructs have a composite reliability value above 0.6, confirming that the model has no unidimensional. Therefore, this study demonstrates a high level of reliability.

Inner Model

The study found that the adjusted R square value for emotional responses was 0.654, while the R square value for self-esteem was 0.766, with a total Q^2 of 0.918. This indicates that individual, social, and information technology factors, mediated by emotional responses, accounted for 91.9% of the influence on self-esteem. The remaining 8.1% was due to other variables not included in the study. Therefore, the research model shows a good fit (Table 3).

Table 3. R^2 of Variable

Variable	*R Square*	*Goodness of Fit* (Q^2)
Emotion-regulation	0.654	0.919
Self Esteem	0.766	

Overview of path analysis

The direct effect test was conducted to evaluate the first through fifth hypotheses. The criteria state that if the t-statistic value exceeds the t-table value (1.960) or the p-value is less than 0.05, a significant effect is present. Based on the test results, first, third, and fourth hypotheses were accepted. The significance values for these three hypotheses were less than 0.05 ($p<0.05$), and their t-values exceeded 1.960 ($t>1.960$) (table 4, Figure 2).

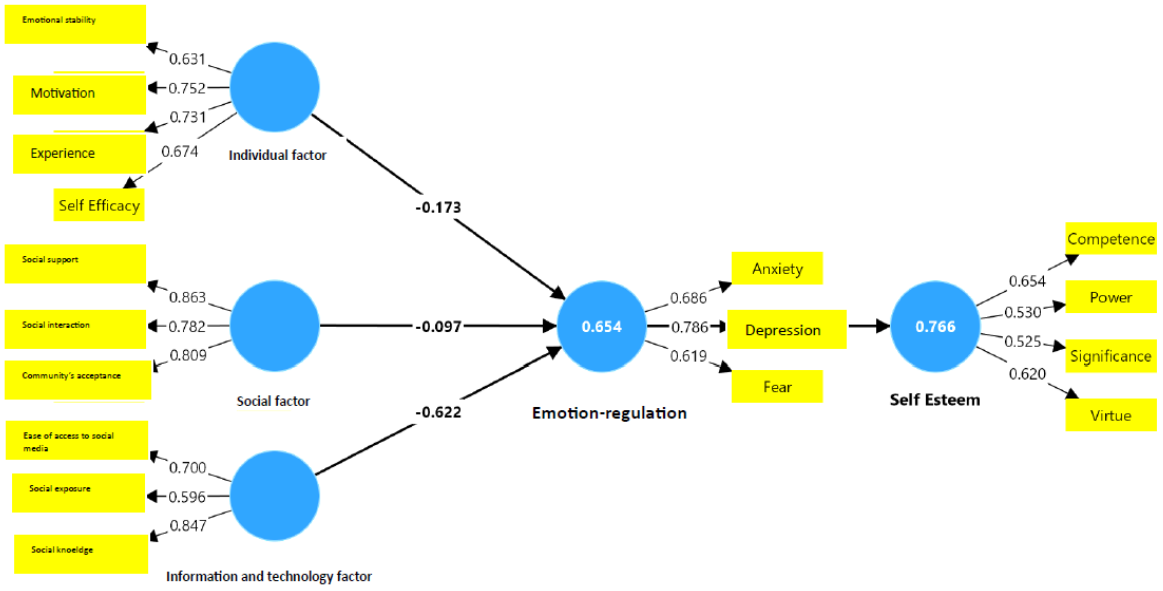

Figure 3. Overview of path analysis

Table 4. The final model of a hypothesis test

	Hypothesis	Path coefficient	T Statistics	P Values	Result
H1	Individual factor → emotion-regulation	-0.173	1.972	0.049	Significant
H2	Social factor → emotion-regulation	-0.097	1.390	0.165	Not Significant
H3	Information and technology factor → emotion-regulation	-0.622	7.407	0.000	Significant
H4	emotion-regulation → *Self Esteem*	-0.875	44.760	0.000	Signifikan

Indirect Effect

The indirect effect test is used to analyze the sixth and seventh hypotheses, in table 5 shows that emotional emotion-regulation is a partial mediator between the influence of information and technology factors on self-esteem. However, for the influence of individual and social factors on self-esteem, emotion-regulation cannot be a mediator, either completely or partially (Table 5).

Table 5. Mediator effect

	Hypothesis	Path coefficient	T Statistics	P Values	Result	Mediator effect
H5	Individual factor → emotion-regulation → Self Esteem	0.152	1.949	0.051	Not significant	Not mediation
H6	Social factor → emotion-regulation → Self Esteem	0.085	1.387	0.166	Not significant	Not mediation
H7	Information and technology factor → emotion-regulation → Self Esteem	0.544	7.327	0.000	Significant	Partial mediation

Discussion

This research aimed to examine how individual and information and technology factors influence self-esteem in nursing students, specifically focusing on the role of emotion-regulation as a mediator. The findings revealed that individual factors significantly impact nursing students' emotion-regulation. Individual factors related to motivation (Oh & Syn, 2015), experience (Treem et al., 2015), emotional stability (Bowden-Green et al., 2021), cognitive ability (Kurt & Eskimez, 2022), and self-efficacy (Hay et al., 2017) in the context of social media engagement. It is necessary to pay attention to the level of knowledge of nursing students regarding social media (Kurt & Eskimez, 2022), knowing the level of ability and experience of nursing students on social media, fostering a positive attitude towards self-esteem which has an impact on motivation (Hay et al., 2017). Individual factors regarding social media had effect on self regulation (Kurt & Eskimez, 2022), such as anxiety, fear and depression.

Regarding information and technology factors, the study found that these elements also significantly affect emotion-regulation (Brady et al., 2017; Fardouly et al., 2015; Lissak, 2018). Information and technology

factors consist of social media exposure, social media knowledge, and ease of access to social media (Yu et al., 2017). Previous studies have indicated that regular use of social media had effect on emotion (Sampasa-Kanyinga & Lewis, 2015). Nursing students, being in a developmental stage, are especially influenced by their surroundings and often express their emotions and feelings more freely through online interactions. Information technology had effect on depression, anxiety, and fear (Keles et al., 2020).

The study further demonstrated that emotion-regulation is a partial mediator between the influence of information and technology factors on self-esteem. Higher emotion-regulation was associated with good self-esteem among students. Frequent use of social media related to information and technology, and it was associated with low self-esteem. Ease to access social media refers to overload information consumption and can trigger stress, depress, anxious, and fear (Andreassen et al., 2017). Students also compare their life with their peer (Chua & Chang, 2016). It has effect on low self-esteem. Emotion-regulation management is needed to prevent it. The study acknowledges several limitations. Since self-report questionnaires were used, the results rely on the respondents' subjective assessments. Additionally, the cross-sectional design limits the ability to establish causal relationships. Despite these limitations, the study underscores the importance of emotion-regulation as a mediator between information and technology factors on self-esteem. Emotion-regulation management is essential for addressing self-esteem.

Conclusion

The findings revealed that individual factors and information technology significantly impact nursing students' emotion-regulation. Individual factors related to motivation, experience, emotional stability, cognitive ability, and self-efficacy. Information and technology factors had effect on self-esteem through emotion-regulation. Information and technology factors consist of social media exposure, social media knowledge, and ease of access to social media. Effective emotion-regulation is essential for managing information and technology factors to enhance self-esteem among nursing students. By regulating social media exposure, improving social media literacy, and controlling access to social media, emotion-regulation can positively influence the development of self-esteem.

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