Tools for Measuring Academic Stress in Students Working on Their Thesis

Ade Ratri Fitria, Mochammad Reyhan Putra Damopoli, Jihan Salsabila

202110515101@mhs.ubharajaya.ac.id

Fakultas Psikologi Universitas Bhayangkara Jakarta Raya

Abstract

This study aims to develop and test the validity and reliability of academic stress measurement tools in students working on thesis, referring to the stress and coping theory from Lazarus & Folkman. This measuring tool consists of 10 items designed to evaluate various aspects of academic stress experienced by students during the thesis preparation process. A total of 150 respondents who are working on their thesis participated in this study. The results of the analysis showed that no items were declared disqualified based on the discrimination test, which indicates that all items were able to distinguish stress levels well among respondents. In addition, 8 out of 10 items showed the uniqueness of the measurement relevant to the characteristics of students working on the thesis, confirming that this measurement tool can be relied on to understand and identify specific academic stress in the context of thesis writing.

Keywords: Academic stress, Thesis Students, Stress analyzer

Introduction

Final year students have the responsibility to complete a thesis, a scientific writing which is an important requirement for obtaining a bachelor's degree. Even though it is a hope to graduate and get a degree, the process of writing a thesis often creates pressure for students (Kurniawti & Setyaningsih, 2020). Writing a thesis is considered the ability to combine knowledge and skills in understanding, analyzing and explaining problems in the field of science being studied. Completing complex academic assignments, meeting tight deadlines, conducting relevant literature searches, collecting and analyzing data, and writing in a

structured manner are challenges that often cause stress. Stress is a physical and psychological response to pressure from the environment that is considered to exceed an individual's ability to overcome or handle it (Arpina & Rahimsyah, 2021).

The stress experienced when writing a final assignment or thesis is often caused by nervous shocks and a decrease in optimism when writing an essay due to a lack of motivation to try, which causes completing the final assignment or thesis to always be considered a very difficult task for students (Fadillah, 2013). When someone experiences stress, it affects them physically, psychologically, and causes different behavioral changes depending on the level of stress they experience.

The academic stress experienced by students when completing their thesis is important in the world of higher education. When preparing a thesis, students need social support from peers, family and supervisors. The process of preparing a thesis often has a time limit which makes students rush or even delay completion, while they are expected to produce quality written work in a research process that is full of uncertainty (Nabila & Sayekti, 2021). In this case, a scale is needed that can measure academic stress in working on a thesis. The stress scale used should have gone through validity and reliability testing so that it can ensure whether the instrument measures the concept of stress validly and reliably. Creating a stress scale can also support the creation of valid and reliable measuring tools for measuring stress (Wicaksana & Rachman, 2018).

The stress experienced by students when working on their thesis will have a significant impact on mental health, especially related to fear of failure in completing their studies (Parastiara & Yoenanto, 2022). By understanding the factors that cause stress and how students deal with it, this research can provide insight into developing effective intervention and support strategies. This can also

help students manage academic stress and also improve overall well-being (Supriyantini & Nufus, 2018).

Literature Review

According to Santrock, stress is an individual's response to situations or events that trigger stress (stressors), which threaten and interfere with a person's ability to cope. Meanwhile, according to Lazarus and Folkman (1984), stress is an internal state that can be caused by physical demands such as illness or exercise, as well as by environmental and social conditions that are considered potentially dangerous. In the study conducted Grandgirard et al., (2002) It was explained that Lazaruz and Folkman's stress theory was also used to study stress among students. Deng et al., (2022) explains academic stress as a condition that arises from pressure and demands to achieve certain academic achievements. Academic stress is a response to tension that arises due to the academic demands that individuals must face (Olejnik & Holschuh, 2007). Academic stress is a condition that occurs due to demands and pressure to achieve certain academic achievements. Academic stress can occur when someone experiences tension due to the academic demands they have to face. This includes internal conditions, such as physical demands on the body or environmental and social conditions that are considered potentially detrimental. Academic stress can also affect a person's ability to handle academic tasks and can disrupt overall health. There is a change in stress levels in students when working on their thesis. For example, there are changes in cognitive aspects, physiological aspects, emotional aspects and behavioral aspects.

Lazarus and Folkman 1984 explained that there are 4 types of stress aspects, namely :

1. Cognitive Aspect

   Stress creates a cognitive response that involves evaluation, including assessing the threat or danger in a situation and its causes. Cognitive reactions also

include disorders such as loss of focus, difficulty thinking, excessive thinking, and persistent intrusive thoughts. Symptoms of stress in the cognitive aspect include difficulty concentrating.

2. Physiological Aspects

When experiencing stress, the body responds by increasing glucose production by the liver to provide energy to muscles, as well as releasing hormones to convert fat and protein into sugar. It increases the body's metabolism to prepare for physical energy, while increasing heart rate, blood pressure, breathing, and muscle tension. In addition, unnecessary body activities such as decreased digestive function and drying of saliva and mucus also occur to improve the quality of the inhaled air.

3. Emotional Aspect

Cognitive evaluation of the environment related to needs, goals, focus, or attention is a determining factor in how a person responds emotionally (Lazarus, 1982). Lazarus and Folkman (1984) noted that some negative emotions, such as anxiety, depression, and anger, arise when a person views a situation as a potential cause of stress and perceives its impact or loss. In other words, the situation is considered risky and can cause suffering or discomfort to the individual experiencing it.

4. Behavioral Aspects

Behavioral responses to stress involve individual actions to overcome perceived stress. These actions can include smoking, overeating or undereating, excessive exercise, or consumption of alcohol or illegal drugs. Behavioral responses depend on how the individual responds to the stressor, either by confronting it directly or avoiding the perceived danger.

Research Methods

This research collected data from 150 respondents who were students who were completing their thesis. Each respondent was asked to fill in a measuring instrument that had been adapted to variables that had been designed based on the research context. This measuring tool is used through a questionnaire with a special academic stress scale for students who are completing their thesis. The Likert scale was used in the measurement, which consists of five answer choices: (1) Strongly Disagree, (2) Disagree, (3) Neutral, (4) Agree, and (5) Strongly Agree. The selected respondents were students who were in the process of completing their thesis. They were given an academic stress measurement scale consisting of 10 items. The collected data was then analyzed using two approaches, namely the discriminative power approach to eliminate irrelevant items and the confirmatory approach to find the items most relevant to the phenomenon being observed.

Table 1 Blueprint for Academic Stress Measuring Tools adapted from (Latifah, 2022)

No	Dimension	Indicator	Aitem
1	Physiological	heart rate, sweating, and decreased digestive function	1. My heart beats faster w... writing my thesis to n... the deadline 2. I sweat excessively wh... am strongly reprimande... my supervisor 3. I feel that my dige... function is decreasing w... I am having se... difficulties while writing... thesis

2	Behavior	tension, difficulty sleeping, headaches	1. I feel tense when I am b… tutored by my superviso… 2. I find it difficult to s… when I think about … progress of writing … thesis 3. When searching for rele… literature, I felt a heada…
3	Emotional	anxiety, restlessness	1. I feel anxious when I ca… control my emotions du… thesis guidance. 2. I feel anxious w… references for my thesi… difficult to find.
4	Cognitive	difficulty concentrating, difficulty thinking	1. I find it difficult … concentrate when writi… thesis according to the f…

and objectives of

research

2. Feeling confused a

continuing guidance

not doing it for a long ti

Results and Discussion

Testing of an academic stress measuring instrument with 10 items has been carried out to measure the level of stress experienced by students working on their thesis, which was developed to have adequate validity. This instrument has proven reliable in identifying academic stress in students working on their theses. Of the 10 items prepared, none failed when the discrimination power test was able to measure academic stress accurately and consistently. This shows that the measuring instrument is quite effective.

Table.2 Statistical Description of Academic Stress

	total
Valid	150
Missing	0
Mean	37.073
Std. Deviation	6.587
Minimum	19.000
Maximum	50.000

Measurement of academic stress in 150 participants showed that there was no missing data. The average academic stress score was 37.073 with a standard deviation of 6.587, indicating moderate variation among participants. The minimum score recorded was 19,000 and the maximum was 50,000, indicating a fairly wide range of stress experiences among students.

According to Azwar (2012), a research instrument is declared to have a good level of reliability if the Cronbach's Alpha coefficient is ≥ 0.60.

Table.3 Consistency Statistics of the Academic Stress Scale

Estimate	Cronbach's α	Average interitem correlation
Point estimate	0.818	0.311
95% CI lower bound	0.770	0.247
95% CI upper bound	0.858	0.379

Data was obtained from measurements involving 150 respondents.

The results of the Cronbach's Alpha analysis test carried out by researchers using JASP (Jeffrey's Amazing Statistics Program) software obtained a point estimate of 0.818. These results show that the 10 items used by researchers are reliable.

Table.4 Statistical Reliability If Items Are Discriminated

Item	If item dropped
	Cronbach's α
V1	0.802
V2	0.816
V3	0.799
V4	0.803
V5	0.794
V6	0.798
V7	0.791
V8	0.802
V9	0.792
V10	0.817

The table above shows Cronbach alpha if item deleted in each stress variable indicator for students working on their thesis. Cronbach alpha if item deleted can be interpreted as the Cronbach alpha value of academic stress working on a thesis obtained if the item is deleted from the questionnaire. If the Cronbach alpha if the item is deleted exceeds the point estimate then when the item is deleted it will increase the alpha value. Item 1 represents heart rate

indicators, item 2 represents sweating, item 3 represents decreased digestive function, Variable 4 represents tension, Variable 5 represents difficulty sleeping, Variable 6 represents headache, Variable 7 represents anxiety, variable 8 represents restlessness, variable 9 represents difficulty concentrate, and variable 10 represents confusion. None of these indicators is higher than the point estimate so these items are still used so that the reliability value does not decrease. This is also in line with Sugiyono (2018) who states that an instrument is said to be reliable if the coefficient value is more than 0.6, then the instrument has reliable reliability.

Table.5 Chi-square calculation results

Model	X^2	df	p
Baseline model	387.220	45	
Factor model	86.787	44	< .001

Note. The estimator is ML.

$\chi2$ is relatively low to df (degree of freedom) with a p value that is not significant (p > 0.05) (Hooper et al., 2008). Chi-square in this study has a high $\chi2$ because the p-value is below 0.05, namely 0.001, so the measurement model by the researchers can be declared to be suitable.

Tabel.6 Component Loadings RC1 & Uniqueness

	RC1	Uniqueness
V3	0.808	0.765
V5	0.770	0.653
V7	0.766	0.571
V9	0.754	0.619
V6	0.748	0.697
V4	0.593	0.674
V1	0.582	0.606
V2	0.536	0.957
V8	0.519	0.538
V10	0.493	0.921

Note. Applied rotation method is promax.

The table above shows that there are 8 items that are unique because the value is > 0.6 (Byrne, 2013). Items that are less than 0.6 are item 7 which represents anxiety, and item 8 which represents anxiety can be said to mean that this item is not included in the uniqueness category.

Fig.1 Path diagram of 10 measurement items
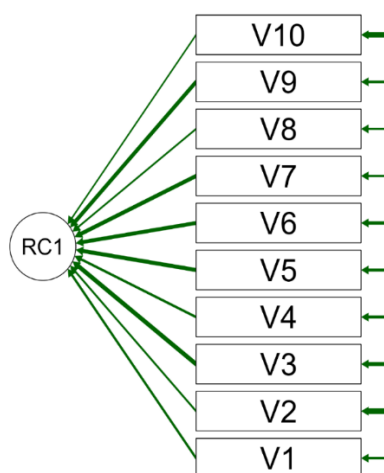
From the path diagram image RC1, it shows that there are 5 measurement items whose strength is not optimal for measuring academic stress in the phenomenon of preparing a thesis. There are also 5 measurement items whose strength is suitable for measuring academic stress. Item 3 represents decreased digestive function, item 5 represents difficulty sleeping, item 6 represents headaches, item 7 represents anxiety, and item 9 represents difficulty concentrating.

Table.5 Measurement Fit Indicators

Metric	Value
Root mean square error of approximation (RMSEA)	0.081
RMSEA 90% CI lower bound	0.055
RMSEA 90% CI upper bound	0.105
RMSEA p-value	0.026
Standardized root mean square residual (SRMR)	0.118
Hoelter's critical N (α = .05)	105.534
Hoelter's critical N (α = .01)	119.756
Goodness of fit index (GFI)	0.986
McDonald fit index (MFI)	0.867
Expected cross validation index (ECVI)	0.859

The table above shows that the RMSEA is at a value of 0.081. This shows that there is rejection of the measurement model parameters created by the researchers because the RMSEA point cannot exceed 0.08 (MacCallum et al., 1996). The table above shows that the SRMR is 0.118, this shows that this value is higher than the standard SRMR value, namely 0.05 (Hooper et al., 2008). Then in the table above

the GFI value above shows a value of 0.986, this shows the acceptance of the minimum value and maximum value (Hooper et al., 2008).

The results of the Cronbach's alpha analysis test show that the 10 items used in the research have good reliability with a pont estimate value of 0.818. This value shows that the instrument used is consistent in measuring stress variables in students who are working on their thesis. Further analysis using "Cronbach Alpha if item deleted" indicates that there are no items that, if deleted, would increase the alpha value above the point estimate. This shows that all items show that all items make a significant contribution to the overall reliability of the instrument which is in line with the view Sugiyono, 2013 which states that an instrument with a coefficient value of more than 0.6 is reliable.

However, Chi-square analysis revealed that the measurement model had a less than optimal fit, as seen from the high χ^2 value and p-value of 0.001, which means it is significant below 0.05. This condition indicates a mismatch between the measurement model and actual data (Hooper et al., 2008). Furthermore, eight of the ten items showed a uniqueness value of more than 0.6, which means these items have quite high unique variance and may not be ideal for measuring academic stress. Item 7 which represents the anxiety indicator and item 8 which represents the anxiety indicator have uniqueness values lower than 0.6, which indicates that these items are more consistent and relevant in measuring academic stress.

RMSEA with a value of 0.081 indicates rejection of the measurement model created by the researcher, because this value exceeds the accepted limit, namely 0.08. This indicates that the measurement model has several weaknesses in reflecting empirical data (MacCallum et al., 1996). In the RC1 path diagram, it can be seen that five items representing indicators of decreased digestive function, difficulty sleeping, headaches, anxiety, and difficulty concentrating have sufficient

strength to measure academic stress, while the other five items are sufficient to measure academic stress. others still need improvement. Overall, this analysis requires refinement of instruments and measurement models to ensure accuracy and reliability in research on academic stress.

Conclusion

The academic stress measurement tool developed, based on Lazarus & Folkman's stress theory, has proven to be valid and reliable for measuring stress levels in students working on their theses. With no items failing in the discrimination power test, this tool is able to differentiate well between stress levels between respondents. In addition, 8 out of 10 items show the uniqueness of relevant measurements, indicating that this tool is suitable for use with students in the context of writing a thesis.

The suggestion given based on these findings is that universities and educational institutions should adopt this measuring tool to routinely evaluate the stress level of students who are writing their theses. By better understanding the levels and sources of stress, institutions can develop more effective support and intervention programs to help students manage stress. In addition, further research is recommended to test this measuring tool on a more diverse student population to strengthen the generalizability of the findings.

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