

Mental Fatigue and Adversity Quotient: A Correlational Analysis of Final Year Students Working on Thesis

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ABSTRACT

This research aims to see whether there is a relationship between mental fatigue and the adversity quotient in college students working on their thesis. This type of research is a survey that aims to see the relationship between mental fatigue and the adversity quotient in final students working on their thesis. The sampling method used incidental sampling. The research sample was 105 final students who were writing their thesis from different faculties. This instrument uses two models, namely mental fatigue with the "Stroop Test" tool via the psytoolkit and adversity quotient scale. The data analysis method used is person product moment analysis with JASP 0.9.2 and showed $r(12) = -.433$, $p = .00$. The results show a negative relationship between mental fatigue and adversity quotient. This study concluded that the higher the mental fatigue of final-year students, the lower their adversity quotient.

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INTRODUCTION

As a student, you have become part of the academic generation undergoing education at the University. Each University has rules regulating the requirements to become a student, starting from acceptance to reaching senior student status. Primarily, final students are closely related to the thesis, where the theory is the final project that students must complete as a condition for graduating at the undergraduate level.

Based on what was stated by Joyner et al. (2018), a thesis is one of the requirements for completing an undergraduate program by making scientific work as writing that presents facts and discusses a topic in detail and in-depth. The thesis is also a type of scientific work that is in-depth and detailed in reviewing a particular topic, so when compiling a thesis, students are required to find and create research problems, design research, analyze data, gather research reports and present the results of their research.

The dynamics of students who are preparing a thesis do take place in a dynamic period of time. In reality, the process of compiling a thesis is different from when students compile reports on other course assignments, because in compiling a thesis students need intention, willingness, and motivation to complete, effort and hard work that is continuously maintained so that students can complete the thesis (Multisari et al., 2023). So, compiling and completing the theory over a long period will impact the individual—one of the impacts of students experiencing fatigue due to cognitive activities that involve thinking hard.

These phenomena are a form of fatigue felt by final students in preparing a thesis and can be categorized as mental fatigue. Van Cutsem et al. (2017) states that mental fatigue refers to activities that involve thoughts

that lead for a long time. Mental fatigue is when the body and mind experience decreased performance and motivation in completing tasks that require mental activity. Kohl (2016) revealed that symptoms of mental fatigue include loss of motivation, difficulty concentrating, difficulty making decisions, short-term memory impairment, and feelings of drowsiness.

Brain condition (internal factor) and environmental (external factor) can influence mental fatigue (Li & Sullivan, 2016; Tran et al., 2020). Internal factors refer to things that exist within a person, such as emotional maturity, psychological well-being, and self-adjustment. Meanwhile, external factors are related to factors originating from the work environment, such as workload and work demands experienced by a person. Lal and Craig (2001) said that mental fatigue is often associated with a decrease in a person's cognitive abilities, which include intellectual aspects such as thinking, remembering, and solving problems. So it can be related to adversity quotient (AQ).

The AQ is the ability to face difficulties (Stoltz, 2010). AQ comes from how a person feels and faces challenges in life. Demanding situations and life trials can improve if a person has a high AQ. Individuals with high levels of AQ tend to have fortitude and do not give up quickly in the face of adversity. High AQ also provides immunity to despair and inability to deal with problems. Conversely, if a person's AQ is low, they tend to be quickly affected by instability and are prone to giving up in difficult conditions. The demands on final-year students working on their thesis tend to experience mental fatigue.

Final-year students working on a thesis tend to experience mental fatigue due to activities involving the mind with a routine that makes students bored. According to Ishii et al. (2014), mental fatigue is when individuals begin to feel mentally tired due to continuous repetitive activities that require concentration and focus attention on cognitive tasks. This is supported by a statement by Etika dan Hasibuan (2016), namely that the difficulty in preparing a thesis by students is often considered a heavy burden. As a result, this perceived difficulty can develop into a negative attitude, cause anxiety, and ultimately reduce motivation.

The adversity quotient is the ability to go through challenging times with obstacles, survive and develop in difficult situations, and then overcome changes in difficulties (Chadha, 2021). In the concept of high adversity quotient, individuals who experience difficulties tend to feel responsible for the problems they face, can control issues, and are shrewd in finding problem-solving as well as in final students who are compiling a thesis when they feel indications of fatigue or mental fatigue, of course, they can control the situation.

Adversity quotient is a meaningful measure and is a series of tools designed to help a person become persistent in the face of various challenges (Stoltz, 2010). Ideally, students possess a high level of adversity quotient, so they keep going even when facing multiple academic tasks, including, in this case, a thesis (Parvathy & Praseeda, 2014). The inability to respond to obstacles or difficulties completing the thesis can eventually lead to mental fatigue. Thus, adversity quotient has a vital role in overcoming various challenges. Students themselves need an adequate level of adversity quotient to overcome all problems, both in academic and non-academic aspects.

So far no one has directly examined the relationship between AQ and mental fatigue directly. Some studies that support our argument are Lal and Craig's analysis (2001). We also consider the causality. However, our analysis tends to be a correlational relationship with some consideration of research results. Saxena and Rathore (2024) mentioned that AQ is a factor in mental fatigue, while other researchers mentioned that mental fatigue affects aspects of AQ, such as endurance (Meeusen et al., 2021) and self-regulation (Siboro,

2024). Based on the above background, the authors are interested in researching "the relationship between mental fatigue and adversity quotient in final students working on their thesis".

METHOD

Design

The research uses quantitative-correlation. Quantitative research conducts research on data in the form of numbers that are processed using statistical analysis methods. The variables in the study consisted of mental fatigue (X) and Adversity Quotient (Y).

Participants

The number of respondents in this study were 105 respondents with the criteria of final students working on their thesis at Bosowa University. The sampling technique used was incidental sampling. Participants in this study took the tests and instruments in person. The characteristics of the participants were also predetermined, such as their status as final-year students working on their thesis.

Procedures

First, participants filled in their identity in the form of demographic data. Second, they took the Stroop test using a laptop. In this study, 40 color words in English were randomly displayed on a computer screen. Each color word was printed in a different color. Respondents were asked to name the color of each word, regardless of the meaning of the word. The subject's English proficiency was also considered. The specifications consist of Intel Core i3-1115G4, 8GB DDR4, 512GB M.2 NVMe SSD, Intel UHD Graphics, 14" FHD (1920×1080), and Color Arctic Gray. Third, participants completed the adversity quotient scale. This study did not specifically control for other elements.

Measurements

This research instrument uses two models, namely mental fatigue with the Stroop Test tool through the psytoolkit site and adversity quotient with a likert scale with cronbach alpha reliability coefficient of 0.938. Measurement of mental fatigue in this study using the Stroop Color-Word Task through the psytoolkit.org site. Pageaux dan Lepers (2016) conducted research on mental fatigue using the Stroop Color-Word Task through the psytoolkit.org site. Where the test tool is a cognitive ability related to behavior and the ability to complete work tasks.

Data analysis

The data analysis technique used is to test the assumptions first and then test the hypothesis. There are assumption tests carried out, namely normality test and linearity test. The hypothesis test in this study used Pearson product moment correlation by JASP 0.9.2.

RESULTS

The categorization of participants based on variables was done in this study. This categorization is needed to see what position the participants are in the population (Azwar, 2012). This is also concrete evidence related to the development of the variables studied, especially in the collage in Makassar. The following is the distribution of categorization between variables:

Table 1. Categorization of Mental Fatigue in Final Year Students

Category Level	Categorization Criteria	Categorization Results	Total	Percentage
Very High	$X > (\bar{X} + 1.5 \text{ SD})$	$X > 1.878,48$	11	10,5%
High	$(\bar{X} + 0.5 \text{ SD}) < X \leq (\bar{X} + 1.5 \text{ SD})$	$1.451,46 < X \leq 1.878,47$	22	21%
Medium	$(\bar{X} - 0.5 \text{ SD}) < X \leq (\bar{X} + 0.5 \text{ SD})$	$1.031,44 < X \leq 1.451,46$	32	30,5%
Low	$(\bar{X} - 1.5 \text{ SD}) < X \leq (\bar{X} - 0.5 \text{ SD})$	$611,42 < X \leq 1.031,44$	35	33,3%

Very Low	$(\bar{X} - 1.5 \text{ SD}) > X$	$611,42 \leq X$	5	4,8%
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Based on the diagram above, 11 or 10.5% of respondents experienced mental fatigue in the very high category, and as many as 22 or 21% of respondents experienced mental fatigue in the high category. As many as 32 people, or 30.5% of respondents, experienced mental fatigue in the moderate category. Thirty-ve people, or 33.3% of respondents, experienced mental fatigue in the low category. Respondents who experienced mental fatigue in the de cient category were ve people or 4.8%.

Table 2. Categorization of Adversity Quotient in Final Students

Category Level	Categorization Criteria	Categorization Results	Total	Percentage
Very High	$X > (\bar{X} + 1.5 \text{ SD})$	$X > 106,89$	13	12,4
High	$(\bar{X} + 0.5 \text{ SD}) < X \leq (\bar{X} + 1.5 \text{ SD})$	$105,53 < X \leq 106,89$	20	19%
Medium	$(\bar{X} - 0.5 \text{ SD}) < X \leq (\bar{X} + 0.5 \text{ SD})$	$104,18 < X \leq 105,53$	29	27,6%
Low	$(\bar{X} - 1.5 \text{ SD}) < X \leq (\bar{X} - 0.5 \text{ SD})$	$102,82 < X \leq 104,18$	39	37,1%
Very Low	$(\bar{X} - 1.5 \text{ SD}) > X$	$102,82 \leq X$	4	3,8%

Based on the diagram above, the adversity quotient in students working on their thesis is 13 people or 12.4% of respondents, in the very high category, then 20 people or 19% of respondents in the high category. Twenty-nine people, or 27.6% of respondents, are in the moderate category; as many as 39 people or 37.1% of respondents, are in the low category; and as many as four people or 3.8% of respondents, are in the de cient category.

Table 3. Hypothesis Test Results

Variables	Sig. (2-tailed)	Pearson Correlation	Description
Mental fatigue and Adversity Quotient	0.000	-0,433	Negative Correlation

Based on the results of statistical analysis, it was found that the pearson correlation value, $r(12) = -.433$, which showed a negative relationship with $p = .000$. These results indicate a relationship between mental fatigue and adversity quotient in nal-year students working on their thesis. The strength of the relationship between the variables is expressed in the correlation coef cient. A correlation coef cient with a positive sign (+) means a positive relationship between the two variables. Meanwhile, a negative (-) correlation coef cient indicates a negative relationship between the two variables. In the Pearson correlation table, a negative value of -0.433 is also obtained, showing the weak relationship. So, the relationship between the two variables in this study is fragile, with a negative correlation direction.

DISCUSSION

Based on the statistical analysis results of researchers on students working on their thesis, a relationship between mental fatigue and adversity quotient with an antagonistic relationship direction was shown. This means that students who have high mental fatigue conditions will have low adversity quotient abilities, and vice versa, so the hypothesis of this study, in other words, is accepted, namely that there is a relationship between mental fatigue and adversity quotient in students who are working.

Thomas (2019) state that mental fatigue arises from intense and sustained cognitive activity, such as working with demanding tasks that require concentration, planning, decision-making, and problem-solving. It is not just about feeling physically tired but has more to do with decreased concentration, mental acuity, and overall cognitive performance. Mental fatigue occurs in final students usually due to several things. Julita et al. (2015) states that there are several inhibiting factors in the completion of the thesis

in students, namely finding thesis material or title and discussing thesis problems with the supervisor is an important step in the thesis consultation process. The phenomenon in working on a thesis also departs from the discrepancy between the research interests proposed by students and the expectations offered by the supervisor (Kamler & Thomson, 2014; Lee, 2019; Razali, 2020). This also makes students expend excessive physical and psychological power.

The dynamics of final-year students while working on their thesis certainly vary during the period of study completion. They face pressure and obstacles with intensity and diversity internally and externally. Internal factors refer to things that exist within a person, such as emotional maturity, psychological well-being, and self-adjustment. Meanwhile, external factors are related to factors originating from the work environment, such as workload and work demands experienced by a person. The long period according to Setiawan (2019) is expected to cause a decrease in the level of alertness, performance, awareness, mood, and ability of a person. These phenomena are a form of fatigue felt by final students in preparing a thesis and can be categorized as mental fatigue.

A high state of mental fatigue results in a reduced adversity quotient. Previous research on adversity quotient found that it affects the success of students in facing challenges. Verma et al. (2017) conducted research using qualitative methods which found that the adversity quotient affects the ability of individuals to organize and work optimally in unpleasant conditions or under pressure. Final students who are preparing a thesis in this case who have a high adversity question will find out the problems being faced, then analyze by thinking about the right steps to complete the thesis.

Adversity quotient become the ability to go through challenging times with obstacles, survive and thrive in situations that are difficult times which are then able to overcome changing difficulties (Rivalina & Setyowati, 2021). In the concept of high adversity quotient, individuals who experience difficulties tend to feel responsible for the problems they face, can control problems, and are good at finding solutions to problems, as well as final students who are compiling a thesis when they feel indications of fatigue or mental fatigue, of course, can control the situation.

Stoltz (2010) states that several factors influence the adversity quotient, including self-efficacy, coping strategies, social support, emotional ability, experience, and personality. Because of that, the researcher concludes that the adversity quotient is an ability possessed by a person to observe difficulties and process these difficulties or problems using the intelligence he has so that the individual feels that the difficulty he is experiencing is a challenge that must be completed.

The adversity quotient comes from the way a person feels and faces challenges in life. Difficult situations and trials in life can be faced better if a person has high adversity. The students with high levels of adversity tend to have fortitude in life and do not give up easily in the face of difficulties. High adversity also provides immunity to despair and the inability to face problems. Conversely, if a person's adversity is low, they tend to be easily affected by instability and are prone to giving up in the face of difficult conditions. The demands on final-year students working on their thesis tend to experience mental fatigue. With this, someone working and in the mental phase of mental fatigue needs to have the ability to overcome the adversity quotient when facing challenges.

There are three groups of individuals have adversity quotient: quitters, campers, and climbers (Stoltz, 2010). The quitter group refers to individuals with a low level of adversity quotient, so they tend to avoid difficulties by giving up, retreating, and stopping. Meanwhile, individuals who fall into the camper group have a moderate level of adversity quotient where the individual has responded to the challenges or problems he is experiencing in contrast to quitters. At the same time, the climber category is individuals who want to

achieve success for themselves continuously. Individuals who have a high adversity quotient also think about what possibilities exist. Thus, a high adversity quotient can overcome difficulties and pressures being faced.

From the explanation above, it can be concluded that students who have a high adversity quotient are able to find the solution to overcome difficulties or pressures in working on a thesis. The difficulties and pressures being experienced by students are related to mental fatigue. So, it can be said that students who have a high level of adversity quotient can reduce the level of mental fatigue. Although these results are quite positive, we realize it is difficult to ask students to do the stroop test incidentally and suggest increasing the study sample. Future researchers can also control subjects with specifics, such as grouping stress levels and gender.

CONCLUSION

Based on the results of this study on the relationship between mental fatigue and adversity quotient in students working on a thesis, it can be concluded that there is a negative relationship between mental fatigue and adversity quotient in students working on a thesis. The higher the mental fatigue of students during thesis work, the lower their adversity quotient, and vice versa.

Ethics statement

This study was conducted based on ethical standard.

Authors contribution

First author: study design, data collection, statistical analysis, data interpretation, and manuscript preparation. Second author: statistical analysis, data interpretation, and manuscript preparation. Third author: manuscript preparation and literature search.

Conflict of interest

There is no conflict of interest in this study.

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