

Stress, Zoom Fatigue, and Learning Outcomes of Bachelor of Nursing Students in The Covid-19 Pandemic

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Abstract

Introduction: Traditional learning has changed to online learning as an implication of the policy to prevent the transmission of the Covid-19 virus in Indonesia. Online learning is a new learning system in Indonesia that uses internet technology networks and can trigger stress and fatigue. **Objective:** This study aims to determine the effect of online learning on stress, zoom fatigue, and student learning outcomes in the undergraduate academic stage of nursing at Sari Mutiara University Indonesia, Prima Indonesia University, and the Institute of Health Sciences of Flora Medan. **Method:** The research design was a correlation analytic study with a cross-sectional approach. The sampling technique used purposive sampling with respondents of as many as 211 people. Data was collected through Google Forms which were sent to nursing students via WhatsApp. The data were analyzed using the Spearman correlation test with a confidence coefficient of $p < 0.05$. **Result:** The results showed that the majority of online learning was good (56.1%), the duration of online learning was >2 hours/day (62.7%), the internet connection was sometimes stable (72.2%, the student's stress level was moderate (45.9%). The majority of students' zoom fatigue was moderate (48.2%). Most nursing students' learning outcomes were cumlaude (65.9%). There was a relationship between online learning and stress levels ($p = 0.037$; $r = -0.144$), zoom fatigue ($p = 0.049$; $r = 0.299$), and learning outcomes for undergraduate nursing students ($p = 0.005$; $r = 0.194$). **Recommendation:** Lecturers need to innovate learning media and explore stress factors, and their relationship with coping strategies in online learning is essential for further research.

Keywords: Covid-19, online, stress, fatigue, learning



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INTRODUCTION

The spread of Covid-19 cases is increasing, so the efforts of the central and local governments are to issue policies on schools and campuses for social restrictions with Work from Home (WFH). This changed the education paradigm and the rapid growth online, resulting in a massive increase in the use of virtual and video conferencing platforms such as Zoom, Microsoft Teams, and Google Meet. Video Conference (VC) has become a daily activity for students and lecturers in delivering learning amid lockdowns and social restrictions worldwide (1).

Online learning at Sari Mutiara Indonesia University, Institute of Health Sciences of Flora, and Prima Indonesia University are not only about mastering technology and lecture materials but also related to competencies that must be mastered according to the subject. These competencies are measured from cognitive abilities and affective and psychomotor abilities. Online learning media and the many competencies that nursing students must master create pressure and stress on students. Less supportive signals, some students lack quotas, and many disturbances when studying at home. Students feel less focused on learning without direct interaction with lecturers and other students, the material presented is difficult to understand, and lecturers need more readiness to prepare material (2-3).

During online learning, the duration of education is also adjusted to the number of credits available. 1.5-3 hours of teaching are the same as learning in class. If in one day there are 3-4 subjects, it will take 5-8 hours a day if it is done in face-to-face learning. Feelings of boredom, lots of material, long learning duration, and monotonous and not conducive learning environment are the causes of learning fatigue (4). Although some students are used to using online media, when it is used excessively, it will cause discomfort (5). Poor time management, assignments, and academic demands increase psychological

and emotional stress, exacerbating student fatigue (6). Feeling tired, restless, or anxious during online learning using a zoom application is called zoom in fatigue. Zoom in fatigue is not limited to zoom meeting media but includes the use of WhatsApp video call media, google meet, and other online learning platforms (7).

Online learning has a negative impact on the health sector, namely fatigue, anxiety, and stress zoom application ((8). Another negative consequence is a decrease in learning performance (9). Decreased learning performance can reduce student learning achievement. The mental impact is stress and even suicide. Based on Yikealo's research, it is known that most students at the Eritrea Institute of Technology tend to experience moderate levels of stress (71%). The results of the study stated that the most frequent stressors that trigger anxiety in students are inadequate learning facilities (40.7%), learning difficulties for an extended period (32.5%), too many assignments, and academic burdens (23.5%) (10).

The urgency of the research is that there is still limited research on the impact of online learning on nursing students in Indonesia/North Sumatra during the Covid-19 pandemic. The study results are expected to screen students' physical and mental health, so that early intervention can be given to prevent the risk of suicide due to prolonged stress and fatigue.

OBJECTIVE

The study aimed to determine the effect of online learning on stress, zoom fatigue, and learning outcomes for undergraduate nursing students during the Covid-19 pandemic.

METHODS

Design

This study is a correlational analytical study with a cross-sectional approach. The study population was undergraduate nursing students at the academic stage of Sari Mutiara Indonesia

University, Institute Health Sciences of Flora Medan., and Prima Indonesia University Medan. A total number of 211 nursing students were selected as samples through purposive sampling.

Data collection process

The instrument used to collect the characteristic data of respondents was an assessment form including demographic data such as age and gender obtained from google form were sent to students by researchers via social media such as WhatsApp.

The online learning instrument was adopted by Andiarna & Kusumawati (2020) and tested for validity and reliability with the value of Cronbach alpha coefficient is 0.8 (5). The measurement results can be categorized as less (12-16), enough (17-20), and Good (21-24).

The individual stress perception instrument uses an adaptation scale from the Perceived Stress Scale (PSS) compiled by Cohen (1988), and the value of Cronbach's alpha coefficient is 0.80. The Indonesian version of this instrument has been translated by Hary (2017), and the validity and reliability were 0.81. PSS score ranges between 0-40. The higher the score indicates, the higher the stress level. The measurement results can be categorized as low stress (0-13), moderate stress (14-26), and high stress (27-40).

The Zoom Fatigue instrument uses the Zoom Exhaustion and Fatigue (ZEF) scale, developed by Fauville et al. (2021), and the validity and reliability of the ZEF instrument are 0.91. The ZEF scale adaptation uses a measuring instrument adaptation guide compiled by Beaton et al. (2000). The ZEE instrument is between 0-25. The measurement results can be categorized as very low (0-5), low (6-10), moderate (11-15), high (16-20), and very high (21-25). The Indonesia version of this instrument was adapted and tested for validity and reliability with the value of Cronbach alpha coefficient is 0.94 (11).

The learning outcome instrument uses a google form in the form of the Grade

Point Average (GPA) of students in the last semester during the Covid-19 pandemic. The measurement results can be categorized as satisfying (GPA = 2.76-3.00), very satisfying (GPA = 3.01-3.50), and Cumlaude (GPA = > 3.50).

Data analysis

The data were analyzed by performing the Spearman correlation test with a confidence coefficient at $p < 0.05$ was used to determine the relationship between online learning. Stress, zoom fatigue, and learning outcomes.

Ethical consideration

The study was conducted after receiving written approval from the ethical committee of the Muhammadiyah University of North Sumatra with letter number 393/KEPK/FKUMSU/2022.

The study was also conducted by emphasizing ethical issues with several aspects as its concern, namely, self-determination, privacy, and anonymity, beneficence, maleficence, justice.

RESULTS

table 1 shows that most nursing students are aged 20 years (25.6%) with female gender (82.9%). More than half of respondents conduct online learning (52.3%). The duration of online learning during the covid-19 pandemic was > 2 hours (65.4%). The majority of internet connections are sometimes stable (71.1%). Most nursing students' stress levels were 98 people (46.4%), and zoom fatigue of nursing students was in the moderate category (49.3%). The majority of nursing students' learning outcomes were in the cum laude category (GPA = > 3.50) (64%).

Table 2 describes the statistical test results showing a relationship between online learning and stress levels (p -value = 0.037; $r = -0.144$). The direction of the relationship is negative and weak. There is a relationship between online learning and zoom fatigue (p -value = 0.049; $r = 0.299$); the relationship's direction is negative and weak. There is a relationship between

online learning and the learning outcomes of undergraduate nursing students (p -value = 0.005; r = 0.194), the direction of the relationship between the variables is positive and weak.

Table 1. Frequency distribution based on age, gender, online learning, duration of online education, internet connection, stress level, zoom fatigue, and learning outcome (n = 211)

Variables	Frequency	Percentage (%)
Age		
18 years	18	8.5
19 years	44	20.9
20 years	54	25.6
21 years	39	18.5
22 years	44	20.9
23 years	10	4.7
24 years	2	0.9
Gender		
Male	36	17.1
Female	175	82.9
Online Learning		
Good	21	47.7
Enough	23	52.3
Less	0	0
Duration of Online Learning		
< 1 hour/day	8	3.8
1-2 hours/day	65	30.8
> 2 hours/day	138	65.4
Internet Connection		
Stable	51	24.2
Sometimes	150	71.1
Unstable	10	4.7
Level of Stress		
Low	85	40.3
Moderate	98	46.4
High	28	13.3
Zoom fatigue		
Low	20	9.5
Moderate	104	49.3
High	59	28.0
Very High	28	13.3
Learning Outcome		
Satisfying	6	2.8
Very Satisfying	70	33.2
Cumlaude	135	64.0

Table 2. The Relationship between Online Learning and Stress, Zoom Fatigue, and Learning Outcomes of

Undergraduate Nursing Students (n = 211)			
Variable	Level of Stress	Zoom Fatigue	Learning outcomes
Online learning	p = 0.037 r = -0.144	p = 0.019 r = -0.161	p = 0.005 r = 0.194

DISCUSSION

The Relationship between Online Learning and Stress Levels for Undergraduate Nursing Students

The results of this study were that most nursing students' stress levels were moderate (46.4%). This can be caused based on respondents' answers. The duration of online learning during the covid-19 pandemic is > 2 hours/day (65.4%), and the internet connection is sometimes stable (71.1%). During a pandemic that requires students to take online learning, students face many obstacles, such as expensive online learning fees, much coursework, difficulty concentrating during online lectures, and concerns about academic grades. Students experience stress due to these demands. In addition, students also need help understanding the material in online lectures.

Supported by research (12), many students in the research sample had moderate academic stress on online learning. This is because the internet network is inadequate, internet packages run out, work piles up, and students must adapt to new conditions amid a pandemic. The results of research on undergraduate nursing students in the Philippines considered that online learning during the Covid-19 outbreak was stressful (44.4%) and very stressful (47.2%). Online learning stress has a significant and inverse correlation with online learning satisfaction ($p=0.000$) and academic achievement ($p=0.012$) (13). The results showed that most 83 students (52.8%) had normal stress levels (14).

In line with research (15), around 59.5% objected to assignments given by lecturers, which resulted in student stress levels of approximately 60%. The weight of

the task makes students burdened so that academic stress occurs. Based on research (16) on 112 research subjects, it was found that 108 respondents were included in the moderate stress category (96.4%). This is because respondents need to become more familiar with the change in learning methods from face-to-face to online learning, requiring a lot of internet quota and problems with poor signal or network.

This study also obtained information that most of the respondents were women. Regarding the stress that occurs in men and women, men are more active and exploratory than women, so women tend to be more anxious and sensitive (17). Supported by research (18) that women (96%) have higher stress levels than men (93%). Female students are more susceptible to stressful conditions. Stress conditions in women are influenced by the hormone oxytocin, estrogen, and sex hormones as supporting factors (19).

The Relationship between Online Learning and Zoom Fatigue for Undergraduate Nursing Students

The results showed that most zoom fatigue nursing students were in the moderate category, with as many as 104 people (49.3%). The occurrence of individual fatigue is subjective and influenced by many factors. The fatigue factor in learning is caused by two factors: internal and external (8). Internal factors are factors that come from within, such as feeling bored. External factors come from outside the individual, such as much material, long learning duration, and monotonous and not conducive learning environment (4). The results of this study show that the duration of online learning during the covid-19 pandemic is > 2 hours/day (65.4%). During online learning, individuals need intense attention to online media and much energy to process the material or information provided (9). More attention to online learning media over a relatively long period is prone to causing fatigue or fatigue in students. The study's results

(Hwang et al., 2020) explain that receiving and processing quite a lot of information over a long period will cause individuals to experience cognitive loads (20).

The cognitive load will affect the physical and emotional, making individuals feel fatigued. This study's results indicate a fragile and negative relationship between online learning and zoom fatigue for undergraduate nursing students ($p = 0.037$; $r = -0.130$). Supported by research (Pustikasai & Fitriyanti, 2021) that there is a significant relationship between online learning and stress and fatigue. Learning media using the zoom application has two times the risk of experiencing fatigue in students and four times the risk of experiencing stress (21). Symptoms of physical fatigue include dizziness, stiff muscle joints, neck pain, insomnia, and other physical symptoms. At the same time, emotional symptoms include the emergence of boredom, feelings of anxiety, and fear. These physical and emotional symptoms indicate that learning with online media causes fatigue because the brain works and the eyes and other body parts work (22).

The Relationship of Online Learning and Learning Outcomes of Undergraduate Nursing Students

Learning online is challenging for students related of the workload that must be faced during the Covid-19 pandemic. This is because students are accustomed to regular face-to-face learning, whereas previous online learning was only done incidentally, so this change in learning patterns created problems for students. Fatigue and stress following conference learning require more concentration and an extended focus in front of a computer/laptop or mobile phone, which is very different from face-to-face learning, so that it can affect learning outcomes.

The results showed that most nursing students' learning outcomes were cum laude (64%). Although most stress levels are moderate (46.4%) and zoom fatigue is moderate (49.3%), it does not

affect learning achievement. Student achievement can be influenced by several factors, both internal from within the student and external factors originating from the environment and learning infrastructure. There are obstacles in online learning, and both lecturers and students can work together to overcome obstacles in online learning that have been implemented. In addition to the ability to study independently, the motivation possessed by students also determines the success of online learning and the availability of supporting learning tools.

Some research results show that online lectures are considered ineffective, but some studies have found that online learning has a positive effect on student achievement. Limbong (2020) found an increase in social studies for UNAI students from level two and above. Only first-level students faced obstacles. This study's results indicate a relationship between online learning and the learning outcomes of undergraduate Nursing students. In line with Dewi's research (2020) on the effect of anxiety during online learning on student achievement at STIKes William Surabaya, it was found that student achievements during the online learning period during the Covid-19 pandemic were at most Achievement index of 3.00-3.49 (very satisfactory) as much as 52% (23).

Conclusions and Suggestions

Based on the results of this study, it was concluded that most undergraduate nursing students were 20 years old and female and online learning was in the sufficient category. The duration of online learning during the covid-19 pandemic was >2 hours/per day. Internet connection was sometimes stable, student stress levels in nursing were moderate, and zoom fatigue was moderate. The results showed a negative and weak relationship between online learning and stress levels. There is a negative and weak relationship between online learning and zoom fatigue. There is

a positive and weak relationship between online learning and learning outcomes.

Educational institutions and lecturers need to innovate/modify learning media with various applications that do not require high concentration so that fatigue and stress in students do not occur. Online learning needs to be supported by facilities, infrastructure, and lecturer skills to avoid stress on students.

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