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THE EFFECT OF DIAPHRAGMATIC BREATHING ON STRESS LEVELS OF NURSING STUDENTS AT PRIVATE UNIVERSITY IN TANGERANG

Garuh Dwi Saptono[1], Lavenia Kristiyani[1] Wanda Astuti[1]
Elysabeth Sinulingga[2*], Winda Silaban[2]

[1]Faculty of Nursing, Pelita Harapan University, Banten 15811, Indonesia
[2]Nursing Profession Program, Faculty of Nursing, Pelita Harapan University, Banten 15811, Indonesia

*) *E-mail:* elysabeth.sinulingga@uph.edu

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ABSTRACT

Students were often stressed because of their exciting lecture and practical schedules, the difficulties of living in a dormitory, and other factors. Nursing students face various pressures in their personal lives and academic roles. Diaphragmatic breathing exercises are a form of therapy that can be used to reduce stress. **Objective***: The objective of the study was to find out how diaphragmatic breathing affected the stress level of nursing students at a private university in Tangerang, Banten.* **Methods***: This study used a pre-experimental quantitative design with a one-group pretest and posttest research design. The method used is consecutive sampling, with a sample size of 225 respondents. This study used the Depression Anxiety Stress Scale (DASS-42) questionnaire administered between February and April 2024. Data analysis techniques include univariate and bivariate analyses using the Wilcoxon signed rank test.* **Results***: The largest number of differences is at the normal level, which previously amounted to 104 people (46.2%) increased to 147 people (65.3%), meaning that there was an increase of 43 students (19.1%). While the least amount of difference is at a very severe level which only increased by 4 students (1.8%). The results of the bivariate analysis obtained a sig value (2-tailed) < 0.001 or equal to Sig < α 0.05, which means that there is a significant influence of diaphragmatic breathing exercises on students' stress levels.* **Discussion:** *The tight schedule of lectures and the pressure of dormitory life risk causing students to experience stress and can affect students in studying. One very simple and easy way to overcome stress is the diaphragmatic breathing technique.* **Conclusion***: It is concluded that the provision of diaphragmatic breathing exercises has a significant effect on student stress levels.*

Keywords*: diaphragmatic breathing, students, stress.*

BACKGROUND

In college, students are faced with various academic demands so that students are vulnerable to experiencing academic stress. If academic demands are not resolved, it will cause distress and a decrease in the immune system. There were several definitions of stress. According to WHO (2023), stress is the state of a person when experiencing worry or mental tension that arises during difficult conditions. Stress is considered a natural response from the body to help cope with threats and challenges experienced with different levels of stress and responses in each individual. Stress can affect the body and cause emotions such as irritability, anxiety, decreased concentration, headaches, decreased appetite, stomach pain, nausea, and disturbed sleep patterns. According to Hidayati & Harsono (2021), stress is a person's response

to a threatening situation, it can be seen as a person's reaction to an event such as writing an exam, or an internal state of mind such as worrying about an exam. An interesting fact is that stress tends to increase with the inability to cope with unpleasant situations. Stress can increase emotions, reduce the ability to think rationally and interfere with decision-making. Recognizing how stress affects a person and how the system responds to stress and recognizing stress symptoms can help control stress stress.

The incidence of stress is currently quite high in the world, with the prevalence of stress according to WHO (2019), which is more than 350 million people in the world experiencing stress. It is recorded that more than 264 million people in the world have experienced symptoms of stress and depression, and 800,000 people in the age range of 15-29 years died by suicide due to not being able to cope with the burden of life experienced.

Adults surveyed worldwide (31 percent) believed that stress was the biggest problem in their country (Statita, 2024). Women at greater risk of stress-related disorders, namely depression and anxiety, than men (Chaplin et al, 2008). Students in Asian counties reported to suffer more from depression, anxiety and stress than the other countries (Asif et al., 2020). In Indonesia, prevalence of stress experienced by university students were varied. A study by Khadijah et al. (2024) showed that 32% students were in severe level, 52% in moderate level, and 16% in light level of stress (Khadijah et al., 2024). Another study by Mardea, Widayanti, and Kristina (2020) reported that most of pharmacy students (50.31%) experienced severe level of stress, whereas only 37.19% non-pharmacy students experienced stress in this level. In the study by Manery et al. (2024), it was stated that nursing students have an academic burden and demands for field practice that can have an impact on students' psychological well-being. They are required to master a large number of complex materials and theories, have many assignments and presentations, a busy lecture schedule combined with field practice can increase students' psychological stress.

Signs of stress are fear, anxiety, restlessness, depression, headaches, sadness, chaotic thoughts, decreased memory, difficulty concentrating, and indigestion, so interventions are needed that can overcome stress levels in students (Setiawaty & Yuliana, 2021). Symptoms of stress in students can be seen from physical symptoms such as experiencing sleep disturbances and psychological symptoms such as emotional disorders and behavioral symptoms that affect students' attitudes. Other symptoms of stress are also shown by the avoidance of association with students who prefer to be alone in the lecture process, so it is very necessary to handle it. Stress management is an effort to reduce tension or emotional burden due to stress that is commonly experienced by students and can cause tension or severe depression if not overcome Ilmi et al (2023).

Stress can be treated pharmacologically and nonpharmacologically. One of the non-pharmacological techniques that can be given is diaphragmatic breathing, commonly referred to as diaphragmatic breathing relaxation (Jeniffer, 2020). Diaphragmatic breathing is a breathing technique that will relax a person and make breathing more effective. When someone does diaphragmatic breathing exercises, the stomach will expand and create negative pressure in the chest, so that air will be forced into the lungs and make breathing more effective, and they will become mjore relaxed.

Based on research conducted by Rosyita (2017), it is proven that diaphragmatic breathing exercises can reduce stress levels, so diaphragmatic breathing can be used as an excellent exercise for reducing stress and tension and to stimulate a relaxation response. Similar research was also conducted by Ma

et al. (2017), which examined the effect of diaphragmatic breathing on negative affect and stress in healthy adults. Their results show that giving diaphragmatic breathing exercises has an effect has an effect on negative affect and stress. According to Hopper et al. (2019), their research on the effectiveness of diaphragmatic breathing to reduce physiological and psychological stress in healthy adults shows that diaphragmatic breathing can reduce physiological and psychological stress. All of these studies showed positive results related to the intervention. However, in the three studies, the respondents used were still relatively small in number and used general respondents. Therefore, in this current study the researcher conducted further research related to the effect of diaphragmatic breathing on a larger number of respondents and more specifically, the research was conducted on nursing students.

With the tight schedule of lectures and the pressure of dormitory life, it is certainly possible that time for oneself is reduced, so that it is at risk of causing students to experience stress. The stress experienced by students affects the learning process, so education is needed that is expected to reduce stress levels in students.

The results of interviewing 10 female students, all felt pressure or stress due to the busyness of lectures such as the tight schedule of laboratory classes, clinics, lots of assignments and dormitory life. Then the results of interviewing male students, there were 3 out of 10 students who felt pressure or stress with the same cause. No action has been taken to overcome this. Based on the description above, the authors are interested in conducting research to find out whether there is an effect of giving diaphragmatic breathing on the stress levels of nursing students at private universities in Tangerang.

METHODS

This research design uses a quantitative approach with a one-group pre-test-post-test research design, conducted at the Faculty of Nursing, Pelita Harapan University, Tangerang, from February to April 2024. The total population of second-year students in the Faculty of Nursing at Pelita Harapan University was 417. Respondents in this study were taken using the consecutive sampling method, with a total sample of 225 students. The sampling technique was consecutive sampling by taking samples based on the inclusion criteria, namely second-year students of the nursing faculty of private universities who live in dormitories and students who are willing to be respondents to do diaphragmatic breathing exercises. The exclusion criteria are students who do diaphragmatic breathing exercises not in accordance with the SOP taught and students who do not perform diaphragmatic breathing exercises according to the schedule given.

The research sample was obtained based on calculations using the Slovin formula in Swarjana (2023) with the following formula and calculations: $n = N : [1 + N (e)^2]$, Description: n = sample size, N = population size, e = desired error limit or tolerated error, $n = 417: [1 + 417 (0.05)^2]$; n = 204 respondents + 10% n = 225 respondents.

The instrument used in this study was the Depression Anxiety Stress Scale (DASS-42) questionnaire to measure stress levels, developed by Lovibond & Lovibond (1995) with international standards that have been translated in the book Imelisa, Roswendi, Wisnusakti (2021). This instrument consists of 42 questions that are divided into three components, namely depression, anxiety, and stress. In this study, only stress components were taken, which were divided into 5 categories, namely normal (score 0-14), mild stress (score 15-18), moderate stress (score 19-

25), severe stress (score 26-33), and very severe stress (score >34). The researcher provided a questionnaire via Google Form media that can be accessed by respondents via a shared link, so that the respondents' answers will be automatically received by the researcher. The questionnaire provided contains statements with answer choices consisting of not appropriate, sometimes, quite often, and very appropriate. Then the points from the answers obtained will be accumulated and grouped according to the categories used in the instrument, namely normal (0-14), mild stress (15-18), moderate stress (19-25), severe stress (26-33). and very severe stress (>34).

The reliability and validity of the Indonesian version of the DASS-42 have been stated in the book written by Imelisa, Roswendi, Wisnusakti (2021). The results show that the validity value for each dimension was above 0.3 and the reliability based on the Cronbach alpha value for each dimension is above 0.9. Therefore, this study used the Indonesian version of the DASS-42 instrument with a sample of emerging adulthood age (n = 245). Analysis of the construct validity by confirmatory factor analysis produced a model with an acceptable fit.

The instrument used to perform diaphragmatic breathing is using a video link from https://youtu.be/Pt9pJGTa9FM?si=0Fe2-okMREh6z7_ (Nurachmah & Sudarsono, 2000). Because this video is an original video made by the researcher based on the source that the author uses about the steps of the diaphragmatic breathing technique, therefore it is hoped that readers can understand and practice what is in the video. The researcher did not conduct content validity of the video that had been made.

Table 1. Frequency Distribution Characteristics of Respondents (n=225)

Demographic Data	Frequency	Percentages
Age		
12 – 16 years	2	0.9
17 - 25 years	223	99.1
Gender		
Female	188	83.6
Male	37	16.4
Total	225	100

Table 2. Frequency Distribution of DASS-42 Pre-test and Post-test (n=225)

Level of Stress	Frequency Pre-test	Percentages	Frequency Post-test	Percentages
Normal	104	46.2	147	65.3
Mild	53	23.6	26	11.6
Moderate	47	20.9	34	15.1
Severe	14	6.2	15	6.7
Very severe	7	3.1	3	1.3
Total	225	100	225	100

Table 3. Difference between Pre-test and Post-test Anxiety Stress Scale (DASS-42) (n=225)

Level Stress	*Pre-test*	*Post-test*	Difference	Percentages
Normal	104	147	43	19,1
Mild	53	26	27	12
Moderate	47	34	13	5,8
Severe	14	15	1	0,5
Very Severe	7	3	4	1,8

Table 4. Wilcoxon Test between Diaphragmatic Breathing with Student Stress Level (n=225)

Variable	N	Negative Ranks	Positive Ranks	Ties	*Sig (2-Tailed)*
Stress	225	139	66	20	< 0,001

In this study, the diaphragmatic breathing intervention was taught by the researcher to the respondents. The meeting to teach the intervention was conducted in two groups consisting of one large group and one small group, this was related to the class schedule of the respondents which consisted of two different schedules. The researcher conducted a pre-test when first met the respondents, then the researcher continued to teach the intervention related to diaphragmatic breathing to the respondents. Then the respondents were instructed to practice independently with the guideline of the diaphragmatic breathing technique video tutorial link from the researcher which was sent to the respondents via the WhatsApp chat group that had been created, through the chat group the researcher also always reminded the respondents to do diaphragmatic breathing exercises every day.

In addition, respondents received a daily checklist sheet that the respondents must always check after doing independent exercises. The checklist sheet that must be filled out by the respondents consists of 7 points indicating 7 days of independent exercise and each day consists of 2 tables showing the first and second exercise because in one day the respondents must do independent training 2 times. So that every respondent who has finished doing independent exercise must give a check mark on the table provided for 7 days of observation. After 7 days of respondents doing independent exercises, the researcher conducted a post-test on all participants. Data were processed through editing, coding, processing, clearing, and tabulating, which were then analyzed univariately and bivariately.

The statistical analysis used was univariate analysis (age, gender and stress level) and bivariate analysis (comparison of stress levels before and after doing diaphragmatic breathing exercises) using the Wilcoxon Test with a meaning limit of Sig < α 0.05. Age of respondents were divided into 2 groups (12-16 years old and 17-25 years old) based on Maryati (2024).

According to Haryani & Setyobroto (2022), ethical principles in health research consist of three principles, namely: 1) respect for persons, which aims to respect the autonomy of a person who has the right to determine

their own decisions; 2) beneficence, providing assistance to people around by seeking minimal harm and maximum benefits; and 3) justice, ethics to provide good treatment to others without violating their rights. This research has been ethically tested with the ethical number 061/K-LKJ/ETIK/I/2024.

RESULTS

1. Characteristics of Respondents

Table 1 shows the characteristics of students in this study, most of whom were female 188 students (83.6%). Then, most of the students aged 17-25 years were 223 students (99.1%). Table 2 shows the frequency distribution of the highest number of students before exercise at the normal level with 104 students (46.2%). While the least number of students is at a very severe stress level as many as 7 students (3.1%). Meanwhile, the frequency distribution of the number of students after diaphragmatic breathing exercises, most of them are at the normal level, with a total of 147 students (65.3%). While the least number of students is at a very severe stress level as many as 3 students (1.3%).

Table 3 shows a change in the number of students at each stress level. The largest number of differences is at the normal level, which previously amounted to 104 people (46.2%) increased to 147 people (65.3%), meaning that there was an increase of 43 students (19.1%). While the least amount of difference is at a very severe level which only increased by 4 students (1.8%).

Table 4 shows the research results obtained Sig (2-tailed) < 0.001 or equal to Sig < α 0.05 then H0 is rejected and H1 is accepted. Based on the descriptive results obtained positive rank stress = 66 and negative rank stress = 139. This means that there is a decrease in student stress levels after getting diaphragmatic breathing exercises, so it is concluded that the provision of diaphragmatic breathing exercises has a significant effect on student stress levels.

DISCUSSION

In this study, before being given diaphragmatic breathing exercises, most students were at a normal level. The results of this study are in line with research conducted by Damayanti et al. (2022), which showed that the majority of student respondents were at a normal level. In their research, it was explained that normal stress is a natural state experienced by individuals in adjusting to prepare for stressors. Although in this study it was found that most students were at a normal level, there were some students who experienced very severe stress.

Stress is a psychological, physiological, and behavioral response that can occur when someone feels an imbalance between demands and their ability to deal with these demands (Adiyono, 2020). Stress has adverse effects, such as making students feel depressed, bored, tired, lose their patience, feel inferior, nervous, and lonely. If left unchecked, stress not only has a subjective impact, it also has cognitive and psychological impacts (Sosiady & Ermansyah, 2020). Therefore, action is needed to reduce student stress levels both pharmacologically and nonpharmacologically.

This study uses diaphragmatic breathing exercises to reduce stress levels in students, which is in line with the research of Hassan, & Dzulkifli (2019). Relaxation techniques, such as diaphragmatic breathing, have a positive impact on stress. Researchers say that diaphragmatic exercise is considered an effective therapeutic option for reducing stress, anxiety, and psychological pressure.

In this study, diaphragmatic breathing exercises were carried out for 7 days and 2 times

a day. This is in line with research by Rosyita (2017), which carried out diaphragmatic breathing experiments for 7 days and carried them out twice a day. The results of this study indicate that there is a decrease in student stress levels after being given diaphragmatic breathing exercises. In the post-test results, the number of students who were at a normal level increased and at other stress levels decreased, so this shows a change in student stress levels after getting diaphragmatic breathing exercises. with the occurrence of changes in stress levels in students other than by doing diaphragmatic breathing exercises, researchers assume that there are other factors that influence changes in stress levels, such as students having found appropriate stress coping, good time management, and having an organized and structured schedule of activities (Priscitadewi et al., 2022).

In this study, most students were in the age range of 17–25 years, for a total of 223. These results are also in line with the research of Martaviani, Amir, & Hasneli (2020), which shows that the majority of students in their research are aged 17–25 years, namely the late teenage age range. This happens because most of the students in this study are students who continue in the undergraduate program.

The majority of students in this study were female; this happened because the majority of nursing students are women. The results of this research are also in line with the research of Martaviani, Amir, & Hasneli (2020), which states that most of the respondents are women. This is evidenced by the fact that by the fact that every year, the number of female students at the Riau University nursing faculty is higher than that of male students. In his research, he also explained that female nurses who are attached to their motherly spirit are more dominant in Indonesia, so that a stigma arises if nurses are identical to women.

In this study, there was a decrease in stress levels in nursing students after being given diaphragmatic breathing exercises. Diaphragmatic breathing is an exercise that can calm brain waves and relax body tissues and all muscles. The purpose of diaphragmatic breathing exercise is to achieve more efficient and controlled ventilation so that it will reduce the work of breathing. In addition, diaphragmatic breathing exercises can increase muscle relaxation and reduce stress and anxiety (Waladani, 2022). After analyzing the data, it was found that there was a significant effect of diaphragmatic breathing exercise for one week on student stress levels.

The results of this study are in line with research conducted by Dhawo, Sadu, & Wicaksono (2024), which shows the effect of intervention groups that have a significant effect on reducing stress using diaphragmatic breathing with NaDa application. Dhawo, Sadu, & Wicaksono (2024) control respondents to do diaphragmatic breathing exercises by providing a reminder system on the respondent's personal application so that respondents can do diaphragmatic breathing exercises according to schedule. This is also done by researchers in controlling students to do diaphragmatic breathing exercises through WhatsApp groups every day according to schedule so that respondents do not miss diaphragmatic breathing exercises so that the results obtained by researchers are more accurate.

According to Hassan & Dzulkifli (2019), their research proves that diaphragmatic breathing practice has a significant effect on stress. This exercise is simple and quick to learn, so it can be done in stressful situations or as an action in stress management to improve the well-being and lifestyle of college students.

Research conducted by Rosyita (2017) shows that there is an effect of diaphragmatic breathing exercises on reducing student stress levels. The provision of diaphragmatic breathing exercises puts the body in a relaxed

state. The results of this study are also justified by the recognition conveyed by several students.

Similar research was also conducted by Ma et al. (2017), which examined the effect of diaphragmatic breathing on negative affect and stress in healthy adults. Their results show that giving diaphragmatic breathing exercises has an effect has an effect on negative affect and stress. According to Hopper et al. (2019), their research on the effectiveness of diaphragmatic breathing to reduce physiological and psychological stress in healthy adults shows that diaphragmatic breathing can reduce physiological and psychological stress. Researchers say that diaphragmatic breathing exercises can be done easily because they do not require special equipment or settings, are easy to learn, and are cost-effective. Therefore, researchers chose this exercise to be given to students so that they do not have difficulty doing it and are more cost-effective.

From the results of this study, it can be seen that diaphragmatic breathing exercises can reduce student stress levels because there are significant differences in stress levels before and after diaphragmatic breathing exercises. This exercise is beneficial for Pelita Harapan University Nursing students because, from the results of the study, it was found that most Pelita Harapan University Nursing students experience stress in lectures due to busy schedules such as laboratory classes, clinics, many assignments, and dormitory life. Stress can have a negative impact on students when undergoing lectures; therefore, stress in students must be overcome, one of which is by giving diaphragmatic breathing exercises. After students are given diaphragmatic breathing exercises, the results show that there is a decrease in the stress level of nursing students, which means that diaphragmatic breathing exercises have an effect on the stress level of nursing students.

The limitations of this study are that the researcher used the one group pre-test and post-test method without a control group and only focused on one group so that the researcher could not see the difference in the results of which action was better, whether only diaphragmatic breathing exercises or diaphragmatic breathing exercises plus other interventions. It was only carried out for 1 week and the time was felt to be insufficient, it would be better if diaphragmatic breathing exercises were carried out for a longer period of time, when respondents did diaphragmatic breathing exercises for 1 week the researcher did not meet face to face with the respondents so that the researcher could not observe directly and find out whether the respondents were actually doing diaphragmatic breathing actions.

CONCLUSION

This study shows that diaphragmatic breathing exercises significantly reduce the stress levels of nursing students. This technique is easy to do and effective in providing relaxation and reducing the negative effects of stress. Therefore, the practice of diaphragmatic breathing exercise is recommended as an effective nonpharmacological method to manage stress in nursing students, support their mental and physical health, and improve their quality of life. The researcher suggested that students can apply this exercise independently as part of their stress management strategy. Furthermore, the researcher suggested that future researchers conduct a study using an experimental group and a control group to see the comparison. Besides that, further researchers are also advised to provide diaphragmatic breathing exercises directly with longer observations so as to ensure that respondents do the exercises correctly and the research results are more accurate and representative.

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