

## EFFECTIVENESS OF SELF-MANAGEMENT NECK STRETCHING EXERCISES AMONG STUDENTS OF UPH-DJGTMU EXPERIENCING MUSCULOSKELETAL NECK PAIN

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### ABSTRACT

Neck pain is one of the most common musculoskeletal conditions on a global basis. Musculoskeletal neck pain has become more prevalent among students due to online classes since the pandemic started. The most frequent causes of musculoskeletal neck pain are postural strain, repetitive overuse, and prolonged immobilization. There are many potential interventions to alleviate musculoskeletal neck pain, and among the interventions are manual therapy, manipulation and exercises. However, there is limited data on what exercises are effective in alleviating musculoskeletal neck pain. This study aimed to determine the effectiveness of self-management neck stretching exercises among students of UPH-DJGTMU experiencing musculoskeletal neck pain. SLANNS was used to select the respondents for this study. Twenty-one male and female students of medical technology and pharmacy department of UPH- Dr. Jose G. Tamayo Medical University who were taking online classes that classified under mild musculoskeletal neck pain were selected as respondents to this study which lasted for 9 sessions. VAS and NDI outcome measures were used to measure the pain and disability of the respondents prior and after the treatment sessions. The Visual Analogue Scale (VAS) and Neck Disability Index (NDI) showed significant improvement in the post-test scores compared to the pre-test scores which signified that there is a decrease in the musculoskeletal pain of the respondents. Therefore, the use of self-management neck stretching exercises was effective in decreasing musculoskeletal pain among students of UPH-DJGTMU.

**Keywords:** Neck Pain, Stretching, Online Classes

### INTRODUCTION

The most frequent causes of musculoskeletal neck pain are trauma, chronic stress, or deteriorating age-related illness are by far the most frequent causes of musculoskeletal neck pain. Whiplash, ruptured discs, and muscular pain can all be triggered by traumatic injury inflicted in a fall or collision. (National Spine & Pain Centers, 2019.) Even basic tasks like sitting behind a desk for too much, gardening, driving, aerobics, and house chores can put stressed muscles and discs at risk for injury caused by chronic overuse. Musculoskeletal neck pain is described as pain that acts on the muscles, ligaments, tendons, and bones. Musculoskeletal pain can be triggered by a mixture of considerations. The wear and tear of daily activities can cause muscle tissue injury. Postural strain, repetitive movements, overuse,

and prolonged immobilization are all contributing factors of pain. Alteration in posture or terrible body mechanics can end up causing spinal alignment issues and muscle shortening, causing other muscles to be fatigued and painful (DerSarkissian, 2021). Stretching primarily aims to increase the length of a musculotendinous unit, or the distance between the origin and insertion of a muscle. The following are three commonly utilized muscle stretching techniques: static, dynamic, and pre-contraction stretches. Active and ballistic stretching are two types of dynamic stretching. (Page, 2012). Active stretching generally involves moving a limb through its full range of motion to the end ranges and repeating several times. Static-active stretching is another term for active stretching. Active stretching improves active flexibility and agonistic muscular strength. (Massachusetts Institute of Technology, n.d.).

The education system of the whole world was suffering during the COVID-19 pandemic crisis. The whole world started to use gadgets such as laptops, mobiles phones, tablets, iPads, and desktop computers to attend school which are now known as online learning or classes, distance learning, or e-learning (Li & Lalani, 2020). The constant strain of the musculoskeletal system in relation to incorrect ergonomic devices usage in periodic work is named work-related musculoskeletal disorders (Tunwattanapong et al., 2015). During this pandemic, university students usually spend most of their time using gadgets such as laptops and mobile phones while being seated on an unfit chair and having inappropriate postures to attend online classes and do their tasks in school. This type of scenario leads the university students to experience musculoskeletal modifications and injuries, specifically in the neck and the spine. (Roggio et al., 2021). The purpose of this study was to perceive the effectiveness of self-management neck stretching exercises in treating and managing musculoskeletal neck pain. The COVID-19 pandemic is still prevalent globally. The Philippines was the only country in Asia that has yet to fully resume face to face classes last middle of 2022 (Limos, 2021). The extreme use of these gadgets led to musculoskeletal neck pain in the students attending online classes. This study aimed to determine the effectiveness of self-management neck stretching exercises to the students of University of Perpetual Help System - Dr. Jose G. Tamayo Medical University who experienced musculoskeletal neck pain due to online classes.

## LITERATURE REVIEW

### Musculoskeletal Neck Pain: Risk Factors and Complications

The study of Haroon et al. (2018) discussed the musculoskeletal pain and its related risks to medical students of a state university in Karachi, Pakistan. The progress of MSP, whether it is chronic pain or injury related pain, influences the broad standard of living as well as the instantaneous lessened productivity in both educational and professional aspect of a person. The objective of this study was to evaluate the frequency and anatomical distribution of Musculoskeletal Pain (MSP) and its related risk factors. The findings of this study reported that the most important predictors of MSP were a history of trauma in the neck, shoulder, or lower back. Age, BMI, gender, academic year, family history of musculoskeletal injuries, hours of clinical practice a day, hours of study a day, smoking, and exercise had no significant relationship with neck, shoulder, or lower back musculoskeletal pain. Neck pain was more common in people who used a computer/laptop for more than three hours per day. Therefore, the medical students had a substantial risk of musculoskeletal pain. A study conducted by Welleslassie et al. (2020) regarding the trouble of neck pain to Ethiopian medical students stated that neck pain is a leading cause of illness, lower educational achievement, and absenteeism from university classes, impacting the employment prospects of the students. The purpose of this research was to discover the prevalence and risk factors

for neck pain among medical students enrolled at Tigray, Ethiopia. In comparison to the general population, medical students appeared to have a higher chance of having neck pain. Aside from the factors that may lead people to pain in general, students put themselves through hours of long periods of reading, writing, and clinical practice, making them a speculative group for neck pain. Furthermore, medical students frequently use computers or tablets. The researchers concluded that physical factors such as painful neck posture and reading time were linked to neck pain, as were individual characteristics such as a history of neck pain and a lack of physical activity. It also suggested that medical school administrators should provide facilities to promote physical activity among medical students. Students gain knowledge of connected health risks and encourage the habit of regular physical exercise.

### Neck Pain Caused by Online Classes

Malik and Tyagi (2020) discussed the universality of musculoskeletal pain caused by online classes during the Covid-19 pandemic lockdown among undergraduates. The researchers stated in this study that students spend most of their time during the Covid-19 lockdown using smartphones/laptops for online classes and recreation. The objective of this study was to determine the percentage of undergraduate students who experienced musculoskeletal discomfort during the Covid-19 period. Second, the researchers wanted to see if there was a link between smartphones/laptop usage and musculoskeletal pain, as well as a link between physical activity and musculoskeletal discomfort. During the covid-19 period, 50.9 percent of students reported experiencing pain. Most students experienced pain in their eyes, neck, and back. This study discovered a small positive association between smartphones/laptop usage and musculoskeletal pain ( $r = 0.312$ ), as well as a mild negative relationship between hours of intense activity or moderate activity and musculoskeletal pain ( $r = -0.2$ ). According to the findings, 50.9 percent of undergraduate students had pain throughout the Covid-19 lockdown time. During this time, excessive use of smartphones/laptops leads to a rise in musculoskeletal pain. Physical activity and musculoskeletal pain have a mild negative association, meaning that as physical activity reduces, pain increases, and as students become more physically active, pain decreases.

### Exercises for Neck Pain

Venkat and Dhumale (2019) discussed the effects and differences of static and dynamic stretching on the extensibility of trapezius muscles in treating chronic neck pain. The purpose of this study is to compare the effect of static versus dynamic stretching on the extensibility of the trapezius muscle in patients with chronic neck pain. Stretching is a treatment used to improve the elasticity of soft tissues, hence enhancing their flexibility by elongating structures that decrease mobility because of adaptation. The literature has documented static, dynamic, ballistic, and stretching techniques based on PNF techniques for enhancing muscular flexibility. Stretching can be accomplished in two ways: static or dynamic. Numerous studies have examined the effects of static and dynamic stretching on muscle extensibility. The findings of this study stated that static and dynamic stretching are equally efficient methods for enhancing trapezius flexibility in patients with chronic neck pain. To increase upper trapezius muscle extensibility, reduce pain, and enhance the functional status, either static or dynamic upper trapezius stretching can be utilized, as both are equally effective in individuals with chronic neck pain. Kim and HwangBo (2019) conducted about using pressure biofeedback to assess the effects of cervical stabilization exercises on neck pain, forward head posture, and the acoustic features frequency and amplitude modulation in patients with chronic neck pain caused by forward head position. The study comprised 20 patients with

persistent neck discomfort and voice abnormalities who presented to the S Exercise Center in Daegu, Korea. For eight weeks, a 50-minute-per-session cervical stabilization exercise program was conducted three times per week. Pressure biofeedback was used to assess the effect of the workouts on neck pain, forward head posture, and the acoustic features of the patients. To determine any changes, measurements were done before and after the intervention. It is found there was a substantial improvement in the neck pain, craniovertebral angle, and acoustic features frequency and amplitude modulation of the patients following the intervention ( $p < .05$ ). Based on measurements made with a pressure biofeedback device, the researchers determined that cervical stabilization exercises had a significantly beneficial impact on neck pain, forward head position, and vocalization stability in patients with chronic neck pain in the current study. This suggested that improving forward head position has a positive impact on postural stability and vocalization.

## **METHODOLOGY**

### **Research Design**

This study utilized quasi-experimental research design. In line with this, the researchers utilized the single group pre-test-post-test design of which there was only a single treatment group. The research design was chosen because it allowed the researchers to investigate the effect of the independent variable on the treatment group in terms of the chosen outcome measures of musculoskeletal neck pain utilizing a pretest and post-test. The collected data using this form of research design allowed the researchers to numerically compare the pretest and post-test scores and determined the effectiveness of the selected intervention in the treatment group before and after the implementation of a predetermined outcome.

### **Population and Sampling Technique**

This study consisted of 21 students who were taking online classes and enrolled in UPH-DJGTMU that experienced mild musculoskeletal neck pain. The researchers drew the sample population with the use of non-probability sampling techniques in the form of criterion sampling.

### **Inclusion Criteria**

The inclusion criteria were the following: 1. enrolled in UPH-DJGTMU; 2. aged 18 and above; 3. had at least 1 year of online class experience; 4. had a Self-reported Leeds Assessment of Neuropathic Symptoms and Signs (S-LANSS) score between 0 to 10 which suggested a predominantly nociceptive type of pain on the pretest; 5. a visual analog scale (VAS) pain intensity score between 5 to 44 mm under mild pain on the pretest; 6. presented a total score of the Neck Disability Index (NDI) for evaluation of neck pain that affected activities of daily living exactly between 5 to 14 score or 0% to 20% under mild disability.

### **Exclusion Criteria**

The exclusion criteria were the following: 1. had a history of neck or shoulder surgery, which included any condition that would preclude the self-managed neck stretching exercise; 2. had any other treatment for neck pain in the prior month, such as manipulation, ultrasound diathermy, medication, and so on; 3. reported an underlying condition or disorder that would limit their ability to perform the planned exercise (e.g., rheumatoid arthritis, degenerative disc diseases, shoulder injuries, heart diseases, asthma, and neurological deficits).

## Instrumentation

The study made use of the BELLAMARA Exercises which consisted of 8 self-management neck stretching exercises. Each position within the exercise program was executed by the respondents for 30 seconds. In between each position of the exercises, a 10-second break was given to let the respondents prepare for the next position and was repeated 3 times. Each therapy session was guided and supervised by the recruited physical therapist and the researchers and lasted for 40 minutes. The respondents were given a brochure which contained the BELLAMARA exercises (Figures 1 to 3) that acted as guide during treatment sessions. The whole exercise program is done once a day, 3 days a week for 3 weeks.

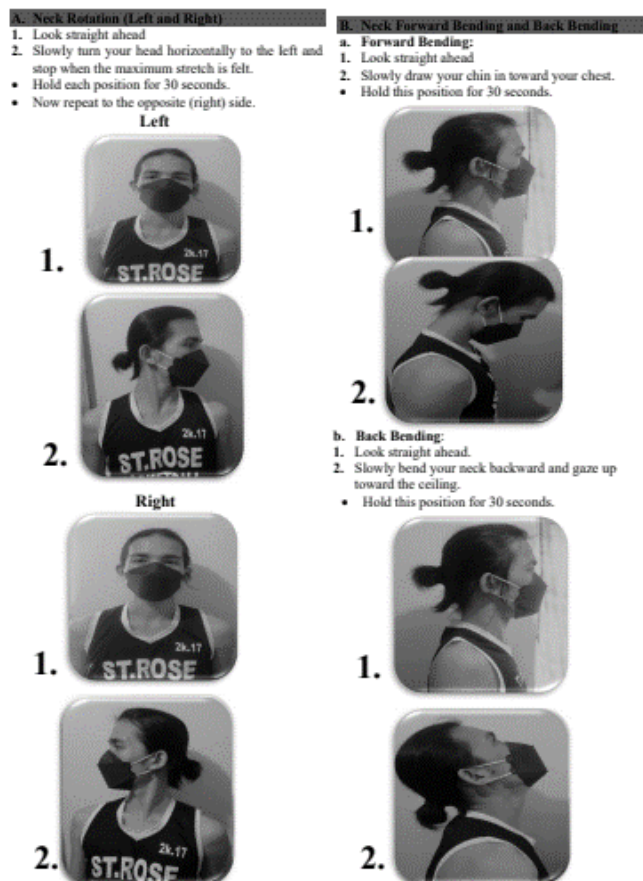


Figure 1. BALLAMARA Exercises

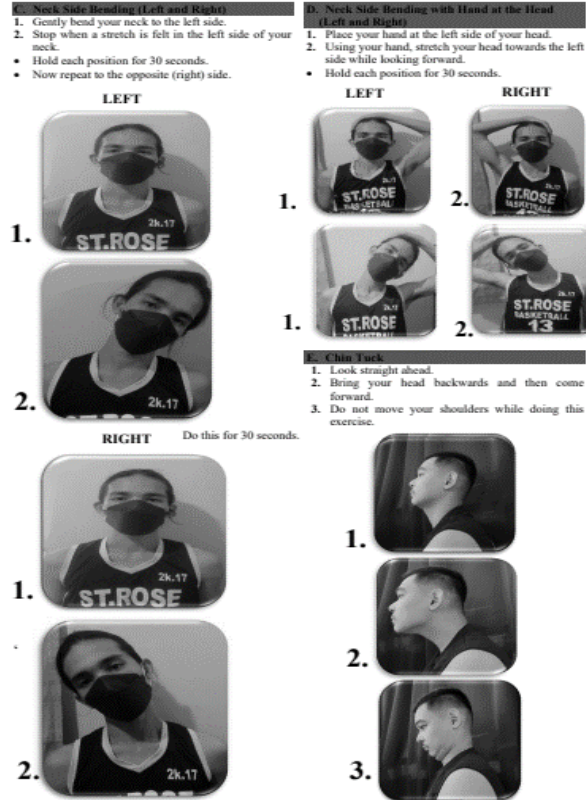


Figure 2. BALLAMARA Exercises

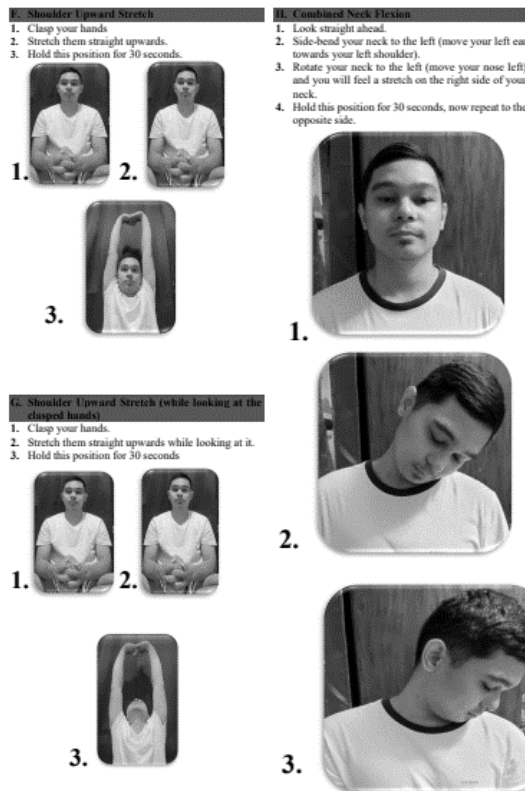


Figure 3. BALLAMARA Exercises

The researchers determined the eligible respondents with the use of the Self-reported Leeds Assessment of Neuropathic Symptoms and Signs (S-LANSS) (Figure 4) that distinguished the respondents' experience of nociceptive pain that differed from neurologic pain. On the other hand, the researchers also utilized two standardized outcome measuring instruments which determined the desired pre-test and post-test scores of the respondents that pertained to the level of musculoskeletal neck pain. The selected outcome measuring instruments were the Visual Analogue Scale (VAS) (Figure 5) and the Neck Disability Index (NDI) (Figure 6).

The S-LANSS Pain Score	
1. In the area where you have pain, do you also have "pins and needles", tingling or prickling sensations?	
<input type="checkbox"/> NO - I don't get these sensations	0
<input type="checkbox"/> YES - I get these sensations	5
2. Does the painful area change colour (perhaps look mottled or more red) when the pain is particularly bad?	
<input type="checkbox"/> NO - The pain does not affect the colour of my skin	0
<input type="checkbox"/> YES - I have noticed that the pain does make my skin look different from normal.	5
3. Does your pain make the affected skin abnormally sensitive to touch? Getting unpleasant sensations or pain when lightly stroking the skin might describe this.	
<input type="checkbox"/> NO - The pain does not make my skin abnormally sensitive to touch.	0
<input type="checkbox"/> YES - My skin in that area is particularly sensitive to touch.	3
4. Does your pain come on suddenly and in bursts for no apparent reason when you are completely still? Words like "electric shocks", jumping and bursting might describe this.	
<input type="checkbox"/> NO - My pain doesn't really feel like this.	0
<input type="checkbox"/> YES - I get these sensations often.	2
5. In the area where you have pain, does your skin feel unusually hot like a burning pain?	
<input type="checkbox"/> NO - I don't have burning pain	0
<input type="checkbox"/> YES - I get burning pain often	1
6. Gently rub the painful area with your index finger and then rub a non-painful area (for example, an area of skin further away or on the opposite side from the painful area). How does this rubbing feel in the painful area?	
<input type="checkbox"/> The painful area feels no different from the non-painful area	0
<input type="checkbox"/> I feel discomfort, like pins and needles, tingling or burning in the painful area that is different from the non-painful area.	5
7. Gently press on the painful area with your finger tip and then gently press in the same way onto a non-painful area (the same non-painful area that you chose in the last question). How does this feel in the painful area?	
<input type="checkbox"/> The painful area does not feel different from the non-painful area.	0
<input type="checkbox"/> I feel numbness or tenderness in the painful area that is different from the non-painful area.	3
<b>Total score:</b>	
<b>Scoring a score of 12 or more suggests pain of predominantly neuropathic origin</b>	
<small>Source: Bennett, M et al J Pain, Vol 6, No 3 March, 2005 pp 149-158 The S-LANSS Score for Identifying Pain of Predominantly Neuropathic Origin: Validation for Use in Clinical and Postal Research.</small>	

Figure 4. Self-reported Leeds Assessment of Neuropathic Symptoms and Signs (S-LANSS)

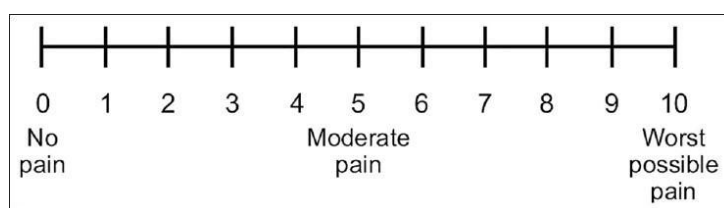


Figure 5. Visual Analogue Scale

**NECK DISABILITY INDEX**

THIS QUESTIONNAIRE IS DESIGNED TO HELP US BETTER UNDERSTAND HOW YOUR NECK PAIN AFFECTS YOUR ABILITY TO MANAGE EVERYDAY -LIFE ACTIVITIES. PLEASE MARK IN EACH SECTION THE **ONE BOX** THAT APPLIES TO YOU. ALTHOUGH YOU MAY CONSIDER THAT TWO OF THE STATEMENTS IN ANY ONE SECTION RELATE TO YOU, PLEASE MARK THE BOX THAT **MOST CLOSELY** DESCRIBES YOUR PRESENT -DAY SITUATION.

**SECTION 1 - PAIN INTENSITY**

- I have no pain at the moment.  
 The pain is very mild at the moment.  
 The pain is moderate at the moment.  
 The pain is fairly severe at the moment.  
 The pain is very severe at the moment.  
 The pain is the worst imaginable at the moment.

**SECTION 2 - PERSONAL CARE**

- I can look after myself normally without causing extra pain.  
 I can look after myself normally, but it causes extra pain.  
 It is painful to look after myself, and I am slow and careful.  
 I need some help but manage most of my personal care.  
 I need help every day in most aspects of self-care.  
 I do not get dressed. I wash with difficulty and stay in bed.

**SECTION 3 - LIFTING**

- I can lift heavy weights without causing extra pain.  
 I can lift heavy weights, but it gives me extra pain.  
 Pain prevents me from lifting heavy weights off the floor but I can manage if items are conveniently positioned, ie. on a table.  
 Pain prevents me from lifting heavy weights, but I can manage light weights if they are conveniently positioned.  
 I can lift only very light weights.  
 I cannot lift or carry anything at all.

**SECTION 4 - WORK**

- I can do as much work as I want.  
 I can only do my usual work, but no more.  
 I can do most of my usual work, but no more.  
 I can't do my usual work.  
 I can hardly do any work at all.  
 I can't do any work at all.

**SECTION 5 - HEADACHES**

- I have no headaches at all.  
 I have slight headaches that come infrequently.  
 I have moderate headaches that come infrequently.  
 I have moderate headaches that come frequently.  
 I have severe headaches that come frequently.  
 I have headaches almost all the time.

**SECTION 6 - CONCENTRATION**

- I can concentrate fully without difficulty.  
 I can concentrate fully with slight difficulty.  
 I have a fair degree of difficulty concentrating.  
 I have a lot of difficulty concentrating.  
 I have a great deal of difficulty concentrating.  
 I can't concentrate at all.

**SECTION 7 - SLEEPING**

- I have no trouble sleeping.  
 My sleep is slightly disturbed for less than 1 hour.  
 My sleep is mildly disturbed for up to 1-2 hours.  
 My sleep is moderately disturbed for up to 2-3 hours.  
 My sleep is greatly disturbed for up to 3-5 hours.  
 My sleep is completely disturbed for up to 5-7 hours.

**SECTION 8 - DRIVING**

- I can drive my car without neck pain.  
 I can drive as long as I want with slight neck pain.  
 I can drive as long as I want with moderate neck pain.  
 I can't drive as long as I want because of moderate neck pain.  
 I can hardly drive at all because of severe neck pain.  
 I can't drive my car at all because of neck pain.

**SECTION 9 - READING**

- I can read as much as I want with no neck pain.  
 I can read as much as I want with slight neck pain.  
 I can read as much as I want with moderate neck pain.  
 I can't read as much as I want because of moderate neck pain.  
 I can't read as much as I want because of severe neck pain.  
 I can't read at all.

**SECTION 10 - RECREATION**

- I have no neck pain during all recreational activities.  
 I have some neck pain with all recreational activities.  
 I have some neck pain with a few recreational activities.  
 I have neck pain with most recreational activities.  
 I can hardly do recreational activities due to neck pain.  
 I can't do any recreational activities due to neck pain.

PATIENT NAME \_\_\_\_\_ DATE \_\_\_\_\_

SCORE \_\_\_\_\_ [50]

BENCHMARK -5 = \_\_\_\_\_

Copyright: Vernon H. and Magino C., 1987. Vernon H. Mior S. The Neck Disability Index: A study of reliability and validity. Journal of Manipulative and Physiological Therapeutics 1991; 14:409-415. Copied with permission of the authors.

**Figure 6.** Neck Disability Index (NDI)

## Statistical Treatment of Data

The following statistical tools are used for the quantitative analysis in this study. The mean, which determined the average of the pretest and posttest scores of the VAS and NDI of the treatment group. The paired sample t-test, which determined the significant difference between the mean of the respondents' pretest and posttest findings of VAS and NDI results after the implementation of the treatment intervention.

## RESULTS

The study gathered data from twenty-one (21) respondents who are students from the College of Medical Technology and Pharmacy of the University of Perpetual Help – Dr. Jose G. Tamayo Medical University. The data that were obtained are based on the objectives of the study which included the mean score measurements of the respondents for every pre-test and post-test which determined that there was a significant difference between the mean score measurement of pretest and posttests.

**Table 1.** Demographic Profile of the Respondents

	Frequency	Percentage
<b>AGE</b>		
18 years old	1	4.76
19 years old	7	33.33
20 years old	12	57.14
22 years old	1	4.76
<b>TOTAL</b>	<b>21</b>	<b>100</b>
<b>GENDER</b>		



Male	7	33.33
Female	14	66.67
<b>TOTAL</b>	<b>21</b>	<b>100</b>
<b>NUMBER OF HOURS SPENT IN ONLINE CLASSES</b>		
3 hours to 5 hours	4	19.05
5 hours and above	17	80.95
<b>TOTAL</b>	<b>21</b>	<b>100</b>

Table 1 shows the frequency of the and number of hours spent in online classes. Out of 21 respondents in terms of age, 12 or 57.14% of the respondents are aged 20 years old, 7 or 33.33% of the respondents are aged 19 years old, 1 or 4.76% of the respondents are aged 18 years old and another 1 or 4.76% of the respondents are aged 22 years old. In terms of gender, 7 or 33.33% of the respondents are male and the remaining 14 or 66.67% are female. In terms of the number of hours spent in online classes, 4 or 19.05% spent 3 hours to 5 hours in online classes and 17 or 80.95% spent 5 hours and above in online classes.

**Table 2.** The VAS Pretest Scores of the Respondents

Range of VAS Scores	Frequency
(5-44 mm/Mild Pain)	21
<b>Total</b>	<b>21</b>
<b>Mean</b>	7.00
<b>SD</b>	±9.90

Table 2 shows the frequency of the VAS scores of the respondents before the treatment. As shown in the table, since the study had an inclusion criterion, all of the 21 respondents presented the same VAS score of 5-44 mm which is classified as mild pain.

**Table 3.** The NDI Pretest Scores of the Respondents

NDI Scores (5-14 points/Mild Disability)	Frequency
<b>5</b>	3
<b>6</b>	5
<b>7</b>	1
<b>8</b>	1
<b>10</b>	4
<b>12</b>	2
<b>14</b>	5
<b>Total</b>	<b>21</b>
<b>Mean</b>	9.24
<b>SD</b>	±3.41

Table 3 shows the frequency of the NDI scores of the respondents before the treatment. As shown in the table, since the study had an inclusion criterion, all the 21 respondents presented NDI scores between 5-14 points which is classified as mild disability. Within the NDI scores, the highest pretest score was 14 and the lowest was 5. The NDI pretest mean score is 9.24 and the standard deviation is (SD=±3.41) which also indicated that the level of musculoskeletal neck pain among each respondent varies.

**Table 4.** The VAS Posttest Scores of the Respondents

Ranges of VAS Scores	Frequency
0-4mm (No pain)	17
5-44mm (Mild)	4
<b>Total</b>	21
<b>Mean</b>	1.19
<b>SD</b>	±0.39

Table 4 shows the frequency of the VAS scores of the respondents after the treatment. Within the VAS scores, the highest posttest score was 5 mm while the lowest was 0 mm (See Appendix C). The VAS posttest mean score is 1.19 and the standard deviation is (SD=±0.39).

**Table 5.** The NDI Posttest Scores of the Respondents

NDI Scores 5-14 points (Mild Disability)	Frequency
<b>0</b>	9
<b>1</b>	1
<b>2</b>	1
<b>3</b>	4
<b>4</b>	2
<b>9</b>	1
<b>10</b>	1
<b>13</b>	2
<b>Total</b>	<b>21</b>
<b>Mean</b>	3.24
<b>SD</b>	±4.21

Table 5 shows the frequency of the NDI scores of the respondents after the treatment. Within the NDI scores, the highest posttest score was 13 and the lowest was 0. The NDI posttest mean score is 3.24 and the standard deviation is (SD=±4.21).

**Table 6.** Comparison of the VAS Pretest and Posttest Scores of the Respondents

Mean			t-value	
Pretest	Posttest	Difference	Computed	Critical
7.00	1.19	6.19	9.22	±2.09

**Table 7.** Comparison of the NDI Pretest and Posttest Scores of the Respondents

Mean			t-value	
Pretest	Posttest	Difference	Computed	Critical
9.24	3.24	6	5.01	±2.09

Table 6 and 7 show the comparison of the VAS and NDI pretest and posttest scores of the respondents. The VAS presented a mean of 7.00 on pretest and 1.19 on posttest. The computed t-value was 9.22 and critical t-value was ±2.09. The analysis yielded a significant

difference ( $9.22 > 2.09$ ). The NDI presented a mean of 9.24 on pretest and 3.24 on posttest. The computed t-value was 5.01 and critical t-value was  $\pm 2.09$ . The analysis yielded a significant difference ( $5.01 > \pm 2.09$ ).

## DISCUSSION

In this study, which aimed to determine the effectiveness of self-management neck stretching exercises in treating and managing musculoskeletal neck pain, it was hypothesized that there is no significant difference between the mean pre-test and post-test results of the respondents in terms of VAS and NDI. Three (3) research questions were addressed to answer this hypothesis. The first question focused on determining the demographic profile of the respondents in terms of age, gender and the number of hours spent in online classes. The respondents' demographic profile showed that most of the respondents are 20-year-old females who spent 5 hours and above in online classes. The second question focused on the VAS and NDI scores of the respondents before and after the treatment. The respondents' musculoskeletal pain prior to the self-management neck stretching exercises is classified as mild neck pain with a mean VAS score of 7.00. On the other hand, the respondents' disability is classified as mild neck disability with a mean NDI score of 9.24. After the self-management neck stretching exercises, the respondents' musculoskeletal pain is classified as no pain and mild neck pain with a mean VAS score of 1.19. On the other hand, the respondents' disability is classified as no disability and mild disability with a mean NDI score of 3.24. Lastly, the third question focused on determining if there was a significant difference between the mean pre-test and post-test findings of VAS and NDI results after the implementation of the treatment. The results of the study showed that there was a significant difference between pre-test and post-test scores. Thus, the null hypothesis must be rejected.

The findings of the study correlated with the study of Hwang et al. (2012), Tunwattanapong et al. (2016), Venkat and Dhumale (2019), Filho et al. (2020) and Amoudi and Ayed (2021) which stated that muscle strengthening and, dynamic, and static stretching exercise programs provided significant differences and results in reducing and relieving the MSK neck pain. Even though the result of this study seems acceptable, researchers have found limitations during implementation and with the recommendations of the research panelists and adviser. First is to conduct research that will include preventive measures to raise awareness to students who spend more than 5 hours in online classes. Second, is to conduct research that utilizes self-management neck stretching exercises on various population and lastly, is to conduct research that utilizes self-management neck stretching exercises on different etiologies of musculoskeletal neck pain, not only due to online classes, to assess its effectiveness.

## CONCLUSIONS

The statistical data gathered showed that self-management exercises that lasted for nine sessions had a significant effect and has decreased the pain and disability of the respondents. This study also gathered information that musculoskeletal neck pain was more prevalent in female students who spend more than 5 hours in online classes. Therefore, the researchers conclude that the use of self-management neck stretching exercises was effective to decrease the musculoskeletal pain of students.

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