

EFFECTIVENESS OF TELEPHYSIOTHERAPY BASED NECK AND SHOULDER EXERCISE IN REDUCING NECK PAIN AMONG UNDERGRADUATE COMPUTER USERS TAKING-UP ONLINE CLASSES

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ABSTRACT

Telephysiotherapy is a physical therapy service at a distance using any telecommunication technology when an in-person visit is not permissible. It has been a way by physical therapists to deliver treatment, management, and checkups. With the world going through a pandemic, many restrictions were placed which affected how physical therapy services are given. Neck pain is one of the most common complaints among various populations, especially for those whose nature of work includes prolonged sitting without changing positions—similar to those students attending online classes. Consequently, this musculoskeletal condition can result in uncomfortable and limited movements when doing their everyday tasks and may affect the quality of life. With that, the study opted to tackle this problem by using telephysiotherapy based neck and shoulder exercises in reducing neck pain among undergraduate computer users who are taking-up online classes. The study utilized a One-Group Pretest–Posttest Design where the respondents were composed of 35 students with mild to moderate neck pain. The researchers, together with a physical therapist, prescribed the respondents to do the exercise once a day for 20 sessions. 12 sessions were done synchronously via video call with researchers, a physical therapist, and the respondents while 8 sessions were done asynchronously wherein the respondents were only tasked to fill up a form available throughout the day once they have done their exercises. The researchers used the Visual Analogue Scale (VAS) and Neck Disability Index (NDI) to see if there is a decrease in pain and disability of the respondents. Results showed that after the 20 sessions of the telephysiotherapy based neck and shoulder exercise, there was a significant decrease in the respondent's neck pain before after the telephysiotherapy exercises in terms of the VAS ($15.56 > \pm 2.03$) and NDI ($10.58 > \pm 2.03$). In conclusion, the use of the telephysiotherapy based neck and shoulder exercise is an effective way of reducing neck pain among undergraduate computer users taking-up online classes and can be done instead of face-to-face physical therapy management.

Keywords: Telephysiotherapy, Neck and Shoulder Exercise, Neck Pain, Computer Users, Online Classes.

INTRODUCTION

Today's world is fighting a pandemic, the COVID-19; an infectious disease that became a major health problem globally. Consequently, instead of attending classes physically—online distance learning took place. This set-up has resulted in the use of different gadgets such as cell phones, tablets, or computers for longer periods of time. Abler (2020), stated that because of the computer's design, specifically the proximity of the screen and the keyboard, using a computer encourages a crouching posture, with the arms up too high, the neck craned forward, and a slouching back which can result in neck pain. In addition, various interventions have been recommended in improving neck pain such as massage, manual therapy, ergonomics, multidisciplinary treatment, therapeutic modalities, and exercise (Verhagen et al., 2004). Among these, stretching exercises are the treatment of interest in this study. Stretching exercise has always been included as a part of a training and recovery program. Thus, evidence shows that stretching can decrease muscle stiffness by elongating the elastic component of the musculotendinous unit (Page, 2012).

The aftermath of the pandemic has taken a toll on how healthcare can be accessed and delivered. Telephysiotherapy, that is, a way in which therapists can communicate with their patients virtually. It includes the use of media such as videoconferencing, emails, apps, etc. in conveying programs from healthcare professionals to the patients. It can provide quality care at a lower cost with outcomes that are similar to face-to-face care (Leader, 2020). Appropriate use of telerehabilitation can bridge gaps in delivery of health care and address concerns that need more action when face-to-face methods are not accessible. (Leochico and Valera, 2020). Some studies that cater the use of telephysiotherapy reported that it is feasible and effective in the management of diseases such as spinal cord injuries, multiple sclerosis, and more. (Ricker et. al, 2002). In fact, the use of rehabilitation could possibly overcome the difficulties caused by the lack of access to appropriate musculoskeletal care due to limited amounts of research. With that being said, there have been limited studies regarding the use of telephysiotherapy in the management of neck pain. Furthermore, studies related to the use of telephysiotherapy in relation to stretching exercises are also limited up to this day. Lastly, telephysiotherapy research conducted in the Philippines happens to be very scarce, while studies regarding neck pain management mostly have office workers as respondents.

From the related studies mentioned, it is strongly evident that telephysiotherapy can be a useful tool in delivering exercises for the management of neck pain. The primary aim of this study is to determine the effectiveness of telephysiotherapy based neck and shoulder exercises in reducing neck pain among undergraduate computer users taking up online classes.

METHODOLOGY

Population

The population of the study was composed of 35 students from the College of Physical Therapy and Occupational Therapy in a university located in Binan, Laguna

To be qualified for the study, the inclusion criteria are as follows: (1) The respondents had to be a student from the university in Binan, Laguna, (2) between 18-25 years old, (3) a computer user, (4) not involved in other or any kind of exercise routines, (5) have experienced chronic neck pain (> 3 months), (6) have experienced neck pain with a VAS score ranging from 5-74 induced by prolonged computer work. On the other hand, the respondents were excluded if they had a (1) history of traumatic neck injury, or surgical condition, (2) a systemic disease,

(3) a pre-existing medical condition, and (4) currently receiving formal medical treatment for neck pain like medications, electrotherapy, etc.

A non-probability sampling technique was applied in this study. The sample population was chosen through a purposive sampling method based on the criteria set forth.

Research Design

The study utilized a quasi-experimental type of research in order to statistically determine the effectiveness of telephysiotherapy based neck and shoulder exercise in reducing neck pain among undergraduate computer users taking up online classes in a university located in Binan, Laguna under the College of Physical Therapy and Occupational Therapy. The researchers conducted a study in which the treatment, procedure, or program was intentionally introduced, and a result or outcome was observed. In accordance with these procedures, One-group Pretest-Posttest Research Design was used by the researchers, similar to the study of Adhikari et al., (2020), where the group of respondents was evaluated before and after the intervention. The Visual Analogue Scale and Neck Disability Index were used to assess and establish the effectiveness of telephysiotherapy based neck and shoulder exercises in reducing neck pain. The basic principle behind the pre-test and post-test is to obtain a baseline measure prior to administering the treatment procedure and to test after treatment procedure in order to obtain the results for the comparison to the said baseline measure

Assessment

The qualified respondents were oriented and interviewed by a board certified physical therapist through a video call conference meeting before proceeding to the implementation proper of the study. The exercise proper of the study was also done via video conference calls where the respondents were taught and supervised by a board certified physical therapist all through the sessions. All respondents had completed an exercise program consisting of 20 sessions spread over a 4-week period (5 d/wk). The exercise program was the same for all respondents including stretching exercises for the neck and shoulder. All respondents were interviewed and evaluated at entry (baseline) and after 4 weeks by a board certified physical therapist. At entry, neck pain and disability were assessed and recorded. Sociodemographic information was also collected, for example, age, sex, pain duration, working status (yes/no), and if neck pain was being treated.

Neck pain was evaluated with the Visual Analogue Scale (VAS). This instrument is composed of a line with a 100-point equivalent, with 2 descriptors representing both spectrum of pain intensity (e.g., no pain and extreme pain). A higher score means greater pain intensity (0-4 - No pain, 5-44 - Mild pain, 45-74 - Moderate pain, 75-100 - Severe pain) (Jensen et al., 2003). On the other hand, neck disability was evaluated with the Neck Disability Index (NDI). This test includes 10 items assessing the areas of activities of daily living, attention and working memory, functional mobility, life participation, occupational performance, pain, quality of life, and sleep. Each item is scored from 0 (no pain or limitation) to 5 (maximum pain or limitation), giving a total NDI score range from 0 to 50 points. Higher scores indicate greater disability (0-4 = none, 5-14 = mild, 15-24 = moderate, 25-34 = severe, and >34 = complete) (MacDermid et al., 2009). Neck pain and disability were considered as outcome measures. A post-test assessment using the VAS and NDI, both with similar procedures as the pre-test assessment, was conducted after the implementation phase. The results gathered from the respondents were given to the statistician for statistical treatment. Afterwards, the data collected underwent

checking, comparing, and interpretation of results from the pre-test and post-test that were provided by the statistician.

RESULTS AND DISCUSSION

Table 1. VAS and NDI Pre-Test Scores Before the Telephysiotherapy Based Exercise Program

Respondents	VAS Pre-test scores	NDI Pre-test Scores
1	25	12
2	52	46
3	45	14
4	29	14
5	38	18
6	44	12
7	37	8.888888889
8	55	18
9	20	20
10	44	14
11	25	12
12	31	24
13	20	10
14	37	12
15	30	6.666666667
16	20	13.33333333
17	50	8.888888889
18	40	22
19	35	16
20	30	14
21	30	16
22	25	10
23	17	20
24	47	15.55555556
25	20	8.888888889
26	45	8
27	51	35.55555556
28	18	12
29	45	18
30	50	16
31	40	15.55555556
32	38	22
33	19	11.11111111
34	24	10
35	36	28.88888889
AVERAGE:	34.63	16.10

Table 1 shows the Visual Analogue Scale (VAS) and Neck Disability Index (NDI) scores of each participant before the exercise intervention (pre-test). It shows that the highest score in Visual Analogue Scale (VAS) is 55, while the lowest is 17 and the mean score is 34.63. Consecutively, the highest score in Neck Disability Index (NDI) is 46 while the lowest score is 6.666666667 and the mean score is 16.10. Table 1 served as a baseline measure and shows that before the telephysiotherapy based exercise program, the respondents are already experiencing neck pain. The results of the VAS scores showed that the respondents experienced neck pain ranging from mild to moderate pain. On the other hand, results of the NDI scores showed that respondents had a disability ranging from mild to complete due to their neck pain. The findings support the study of Ye et al., (2017); Louw et al., (2017); and Amit et al., (2020)

that stated that neck pain is very prevalent during prolonged sitting, computer use, office work, and improper ergonomics which can cause repetitive strain of the muscles.

Table 2. VAS and NDI Post-Test Scores After the Telephysiotherapy Based Exercise Program

Respondents	VAS Post-test scores	NDI Post-test scores
1	10	4
2	23	16
3	15	8
4	9	2
5	0	0
6	8	0
7	2	2.222222222
8	10	4
9	3	2
10	3	4
11	7	6
12	4	2
13	6	4
14	5	0
15	7	4.444444444
16	10	2.222222222
17	7	4.444444444
18	6	6
19	8	12
20	0	0
21	13	4
22	2	6
23	5	6.666666667
24	9	2.222222222
25	0	0
26	0	0
27	14	11.111111111
28	0	4
29	5	2
30	8	6
31	19	8.888888889
32	16	14
33	3	2.222222222
34	8	6
35	7	6.666666667
AVERAGE:	7.20	4.66

Table 2 shows the Visual Analogue Scale (VAS) and Neck Disability Index (NDI) Scores of each participant after the exercise intervention (post-test). It shows that the highest score in Visual Analogue Scale (VAS) is 23 while the lowest is 0 and the mean score is 7.20. Consecutively, the highest score in Neck Disability Index (NDI) is 16, while the lowest is score 0 and the mean score is 4.66. The results showed that the neck pain the respondents had before the intervention program has decreased after the four weeks of intervention program. As seen from the result of VAS, the pain of the respondents after the program is now ranging from no pain to mild pain. On the other hand, the result of the NDI showed that the respondents have reported no disability to moderate disability which indicates that the respondents have improved after the intervention program. The findings support the study of Shariat et al., (2017) and Tunwattanapong et al., (2015) that stated stretching exercises have an impact in decreasing musculoskeletal discomfort, neck pain, and improving quality of life.

Table 3. Comparison of Pre-test and Post-test Scores of Respondents

	Mean 1	Mean 2	Mean Difference	T-Value		Interpretation
				Computed	Critical	
VAS	34.63	7.20	27.43	15.56	± 2.03	SIGNIFICANT
NDI	16.10	4.66	11.44	10.58	± 2.03	SIGNIFICANT

0.05 Level of Significance (Alpha)

Degree of Freedom = 34

n = 35

p-value = 0.0000

Table 3 shows the difference in Pre-test and Post-test Scores with regard to the effectiveness of telephysiotherapy based neck and shoulder exercise in reducing neck pain among undergraduate computer users taking-up online classes before and after using the provided neck and shoulder stretching exercises. The mean difference of pretest and posttest for VAS is 27.43; while the mean difference between pre-test and post-test for NDI is 11.44. The obtained computed t-value in terms of VAS is 15.56, which is greater than the critical value of ± 2.03 at 0.05 level of significance; while the obtained computed t-value in terms of NDI is 10.58 which is greater than the critical value of ± 2.03 at 0.05 level of significance. It can be concluded that there was a statistically significant difference between the two variable scores of pretest and posttest in both VAS and NDI. The results showed that the neck and shoulder exercise program that was given through telephysiotherapy was effective in decreasing the neck pain among students of Physical Therapy and Occupational Therapy taking up online classes. This indicates that the intervention program that lasted for four weeks was significantly effective and had decreased the pain and disability of the respondents.

The findings support the study of Leochico and Valera (2020) which states that telerehabilitation is feasible and is an effective alternative to face-to-face intervention. The authors stated that the respondents of their study found telerehabilitation easy, safe, and convenient. In addition to this, they stated that an appropriate use of telerehabilitation can bridge gaps in delivery of healthcare and address problems quickly when face-to-face methods are not accessible. The findings also support the systematic review of Cottrell, et al., (2016) focused on telerehabilitation as a means of treatment for musculoskeletal conditions as compared to standard practice. In addition, it was also stated that treatment delivered through real-time telephysiotherapy is as effective as face-to-face intervention for the improvement of physical function and pain of musculoskeletal conditions.

SUMMARY OF FINDINGS

After a thorough analysis of data, the findings are as follows: (1) The respondents' neck pain prior to the telephysiotherapy based neck and shoulder exercises ranged from mild to moderate neck pain with a mean VAS score of 34.63. On the other hand, the respondents' disability ranged from mild to complete disability with a mean NDI score of 16.10. (2) The respondents' neck pain after the telephysiotherapy based neck and shoulder exercises ranged from no pain to mild neck pain with a mean VAS score of 7.20. On the other hand, the respondents' disability ranged from no disability to moderate disability with a mean NDI score of 4.66. (3) Results of the study showed that there was a significant difference between pre-test and post-test scores. This indicates that the intervention program that lasted for four weeks had a significant effect and has decreased the pain and disability of the respondents.

CONCLUSIONS

Based on the findings of the study, the following conclusions have been made. (1) Visual Analogue Scale (VAS) and Neck Disability Index (NDI) showed significant improvement in the post-test scores compared to the pre-test scores indicating that there is a decrease in the neck pain of the respondents. (2) The use of telephysiotherapy based neck and shoulder exercise was effective in decreasing the neck pain of undergraduate computer users taking-up online classes. (3) Telephysiotherapy is an effective platform that can be used as an alternative to face-to-face intervention in terms of delivering exercises to patients with neck pain.

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