EFFECTIVENESS OF COVIRTUAL: EXERCISE PROGRAM FOR COLLEGE STUDENTS TAKING-UP ONLINE CLASSES WHO EXPERIENCE LOW BACK PAIN

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ABSTRACT

Telerehabilitation or e-rehabilitation is a new way of rehabilitation service that is delivered with the help of the internet and interactive devices and is much preferred due to the increasing cases of Covid-19 virus. Low Back Pain (LBP) affects a wide range of population, and it is one of the main reasons that hinder people of all ages from performing everyday tasks, especially to those who stay seated for long periods of time. This can result in limitation of movements and poor body mechanics. The researchers opted to address this problem with the use of "CoVirtual", a telerehabilitation program in relieving low back pain experienced by college students taking up online classes. The study utilized One Group Pretest- Posttest design, composed of twenty-six (26) college students with low back pain. The researchers together with a physical therapist administered a synchronous 30-minute exercise program for 4 weeks with 3 sessions per week, consisting of a total of 12 sessions. The researchers used Visual Analogue Scale (VAS) and Oswestry Disability Index (ODI) to see if there is a decrease in pain and improvement on the respondents' functionality. After the 12 sessions of the CoVirtual exercise program, there was a significant decrease in the respondents' low back pain ($19.74 > \pm 2.06$ and $20.45 > \pm 2.06$). This indicates that the four-week intervention of CoVirtual exercise is effective in decreasing low back pain and improving functionality of the respondents.

Keywords: Low back pain (LBP), Telerehabilitation, Strengthening, and Stretching Exercises.

INTRODUCTION

COVID-19 took a huge toll on everyone, and everyone had to compromise into the new normal. This prompted the world, in any aspect, to shift from face-to-face normal day to day activities, into online platform-based activities– the education system being one of the most affected industries. And with the online classes running throughout the day, prolonged sitting is almost expected for the students. This can cause uncomfortable pain especially on the lower back part of the body. Silva et al., (2015) found that there is a high prevalence of musculoskeletal pain in adolescents along with an increased amount of digital device usage. To support this statement, Borhany et al., (2018) also stated that the most common sites of pain among frequent users of computers and internet are head, lower back, and neck. There are many treatments and exercises that can help relieve LBP but according to Shipton E.A. (2018) there was no evidence

that was available that shows one type of exercise is better than another. Stretching and Strengthening Exercise is the treatment that was used in this study. Shariat (2018) proposed that using various myofascial release, stretching, and strengthening techniques in alleviating Low back pain. Since everyone should comply with social distancing and other health protocols, healthcare workers also had to compromise in order to deliver health care among their patients. Telerehabilitation is a new way of rehabilitation service that is used with the help of the internet and interactive devices like laptops, phones and tablets. Previous studies have shown that low back pain was treated using home-based telerehabilitation using McKenzie Exercises and had significant effects in decreasing the pain in the lower back (Mbada et al., 2019). However, there was only limited usage of telerehabilitation in the treatment of low back pain (Leochico 2020). This study ought to determine the effectiveness of the CoVirtual Exercise Program, a telerehabilitation program, in improving the functionality of the respondents and reducing their low back pain.

METHODOLOGY

Research Design

This study utilized a quasi-experimental type of research to determine the effectiveness of CoVirtual Exercise Program among college students taking up online classes in University of Perpetual Help System Laguna-Jonelta and University of Perpetual Help- Dr. Jose G. Tamayo Medical University who experience low back pain.

A One-group Pretest-Posttest Design was utilized in order to compare the before and after effects of CoVirtual Exercise Program in terms of reducing the low back pain of selected college students who are taking up online classes. Visual Analogue Scale and Oswestry Disability Index was used to obtain the data.

Participants

The population of the study consisted of 26 students from the College of Education in University of Perpetual Help System Laguna-Jonelta (UPHSL) Biñan Campus and College of Pharmacy in University of Perpetual Help- Dr. Jose G. Tamayo Medical University (UPH-DJGTMU).

The respondents can either be male or female between ages 18-24 years old, had to be a college student of UPH-DGTMU & UPHSL and was taking up online classes, experienced sitting for > 4hrs, experienced limitation of motion on lower limb, experienced lower back pain since online classes started. On the other hand, the respondents were excluded if they had history of surgical intervention, had spinal deformities or any recent injuries and trauma in the lumbar region, had persistent severe pain, were pregnant, with cognitive deficits or other medical problems and was receiving physical therapy prior to the study or was participating in an exercise training program.
A non-probability sampling technique was applied in this study. The population was chosen through a purposive sampling method.

Procedure

The qualified respondents were oriented by a board-certified physical therapist through video call conference meeting before proceeding to the implementation proper. During the exercise proper, a pre-recorded video instruction of the exercises were provided to serve as a guide

while the respondents were performing the exercise via video conference meeting with supervision from a board-certified physical therapist all throughout the sessions. Out of 32 respondents, only 26 of them completed the exercise program which consists of 12 sessions spread over a 4-week period (3 d/wk). The exercise program was the same for all respondents including stretching and strengthening exercises for the low back.

Outcome Measures

All the respondents were evaluated before the program and after 4 weeks by a board-certified physical therapist. At entry, low back pain and disability were assessed and recorded. Along with that, sociodemographic information was also collected, specifically the age, sex, duration of hours of using computer, medical history and working status.

Low back pain was evaluated using the Visual Analogue Scale (VAS). This instrument is a self-reported scale consisting of a horizontal or vertical line anchored at the extremes by two verbal descriptors referring to the pain status (e.g. 0-100 pain scale). A higher score means greater pain intensity.

Low back disability was evaluated with the Oswestry Disability Index (ODI). This instrument is a self-administered questionnaire that includes 10 sections and with a total of 50 assessing the limitation of different activities of daily living. A higher percentage score indicates greater level of disability.

Statistics

Paired t-test was used to determine the mean difference between the pre-test and post-test scores of the respondents' Visual Analog Scale (VAS) and Oswestry Disability Index (ODI).

RESULTS

The data obtained were based on the objectives of the study which includes the mean score measurements of the respondents for every pretest and post-test and determining if there is a significant difference between the mean score of pretest and post-tests. The data were presented in a tabulated form with descriptions and interpretations of the data before each table.

Table 1. Pre-test Scores: Visual Analogue Scale and Oswestry Disability Index

Respondents	VAS Pre-test scores	ODI Pre-test scores
1	60	18
2	45	17
3	45	12
4	50	15
5	46	19
6	54	16
7	45	14
8	40	13
9	45	18
10	36	13
11	60	14

12	54	16
13	40	14
14	45	17
15	40	15
16	45	14
17	48	10
18	43	14
19	60	19
20	55	14
21	66	12
22	64	18
23	40	14
24	51	20
25	50	16
26	56	21
Average	**49.3461538462/ 49.35**	**15.5 or 31%**

Table 1 showed the pretest scores of each respondent in VAS and ODI. It shows that the highest VAS score that was recorded was 66 which was interpreted as 'moderate pain', while the lowest pain that was recorded is 36 which was interpreted as 'mild pain' and the mean score is 49.35. On the other hand, the pretest scores of the respondents in ODI showed that the highest score was 21 or 42%, while the lowest score was 10 or 28% and the mean score was 15.5 or 31%. Table 1 served as the baseline measure and shows that before the telerehabilitation based exercise program, the respondents are already experiencing low back pain.

Table 2. Post-test Scores: Visual Analogue Scale and Oswestry Disability Index

Respondents	VAS Post-test scores	ODI Post-test scores
1	15	2
2	10	2
3	1	0
4	3	2
5	10	3
6	20	5
7	20	3
8	10	1
9	10	1
10	15	4
11	25	3
12	4	1
13	20	3
14	10	3
15	3	2
16	4	3
17	2	2
18	20	7
19	4	2
20	15	4
21	15	1

22	15	3
23	15	8
24	10	6
25	15	3
26	10	3
Average	**11.5769230769/ 11.58**	**2.9615384615/ 2.96**

Table 2 showed the VAS and ODI scores. The result showed in VAS that the highest pain that was recorded was 25 which was interpreted as 'mild pain', while the lowest pain that was recorded was 1 which was interpreted as 'no pain'. Most of the respondents reported their scores to be in 10 and 15 for VAS, indicating 'mild pain' compared to their previous scores that had 'mild to moderate pain' scores with the mean score of 11.58. In ODI, the post-test scores showed that the highest score was 8 or 16%, while the lowest score was 0 or 0%. The results showed that the respondents, after the treatment, have minimal disability for both highest and lowest scores, having a mean score of 2.96.

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

	Pre-test	Post-test		t-value	t-value	
	Mean 1	**Mean 2**	**Mean Difference**	**Computed**	**Critical**	**Interpretation**
VAS	49.35	11.58	37.77	19.74	±2.06	SIGNIFICANT
ODI	15.50	2.96	12.54	20.45	±2.06	SIGNIFICANT

Table 3 showed the difference in Pre-test and Post-test Scores with regards to the effectiveness of CoVirtual: exercise program for college students taking-up online classes who experience low back pain before and after using the provided stretching and strengthening exercises. The mean average of VAS score upon pretest was 49.35 and the post test was 11.58 with a mean difference of 37.77 and a computed t-value of 19.74. Therefore, there was a significant difference between pretest and post-test in terms of respondents' VAS scores.

On the other hand, the average ODI score upon pretest was 15.5 and then having 2.96 at its post test, thus having the mean difference of 12.54 and a computed t-value of 20.44. This is interpreted as having a significant difference between the pretest and post test of the respondents' ODI scores. Thus, the null hypothesis must be rejected.

DISCUSSION

Telerehabilitation was optimized to provide more research here in the Philippines that tackles cases like low back pain in terms of using telerehabilitation. The study aimed to address the low back pain of the students who are attending online classes intended to use and see the effectiveness of CoVirtual which is a telerehabilitation exercise program in reducing the low back pain due to muscle tightness.

The pretest showed that the respondents' experienced moderate pain before the exercise program was initiated as seen from the result of the VAS. It was also seen that most of the respondents had minimal to moderate disability due to their low back pain, which means that their low back pain has affected them in their daily living in such activities like standing, sitting, and lifting as seen from their ODI results of the pretest. Yucel et.al., (2016) stated in their study that students who are studying in a health university dealt with low back pain and most of the students that suffered from low back pain is due to prolonged sitting when studying. After a 4-week intervention using the CoVirtual Exercise Program, post test scores showed that

only reported mild pain as indicated from the results of their VAS. As for the ODI, it was shown that the respondents have reported minimal disability which indicates that the respondents can cope with most of their daily life activities. Cottrel M.A. et.al., (2016) stated in their study that treatment delivered solely by telerehabilitation is equivalent to face-to-face intervention in terms of improving physical function and also reducing the pain of a certain condition. The data that was obtained showed that the CoVirtual Exercise Program was effective in decreasing low back pain among college students taking up online classes, as seen from the results of the pre and post test, having significant differences from the respondents' pretest and post test. This indicates that over the course of the exercise program, the respondents' low back pain has been significantly relieved, improving their daily life activities.

SUMMARY OF FINDINGS

After a thorough analysis of data, the following are the findings: (1) The respondent's low back pain prior to the implementation of CoVirtual telerehabilitation exercise program falls to mild to moderate pain with mean VAS score of 49.35. The respondents' disability then ranged to minimal to moderate disability with a mean ODI score of 15.50. (2) The respondents' low back pain upon finishing the implementation of CoVirtual telerehabilitation exercise program falls to no to mild pain with mean VAS score of 11.58. The respondents' disability then ranged to minimal disability with the mean ODI score of 2.96. (3) The result of the study showed that there was a significant difference between the pretest and posttest scores of the respondents. This indicates that the intervention that lasted for four weeks had a significant effect and has decreased the pain and improved the functionality of the respondents with decreased disability. Thus, the null hypothesis must be rejected.

CONCLUSIONS

Based on the findings of the study conducted, the following conclusion had been made. (1) Visual Analogue Scale (VAS) and Oswestry Disability Index (ODI) of CoVirtual Exercise Program showed significant improvement of the posttest results in comparison to the pretest scores which indicates significant decrease in the low back pain of the respondents. (2) The use of CoVirtual Exercise Program was an effective way of alleviating the low back pain of college students taking-up online classes. (3) The use of telerehabilitation as a platform in the delivery of exercise programs for low back pain is proven effective just like face-to-face intervention.

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