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Effects of Online Exercise Intervention on Physical and Mental Conditions in Young Adults with Chronic Neck Pain

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Yiting Lin[1,2], Raymond Tsang[3], Jinghua Qian[1]

[1]Beijing Sport University; [2]Beijing Xiaotangshan Hospital; [3]The Hong Kong Polytechnic University

Yiting Lin

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Funders Acknowledgements:
Yiting Lin

Abstract

Objectives

This study aimedto compare the efficacy of online exercise therapy with conventional exercise therapy on pain, function, psychological status and work efficiency of young adults with chronic neck pain.

Methods

A randomized clinical trial recruiting35 university students with self-reported chronic neck pain was conducted. Participants were randomly assigned into the experimental group receiving online exercise therapy and the active control group receiving conventional exercise therapy.Participants in both groups completed the same exercise program 3sessions per week for 6 weeks, with either face-to-face or online mode of delivery by physiotherapists.The pain level was assessed using visual analogue scale (VAS)based on average and at maximum intensity. Neck function and work limitations were assessed by the Neck Disability Index (NDI) and Work Limitations Questionnaire (WLQ) respectively. The Hospital Anxiety and Depression Scale (HADS) and its sub-scales(HADS-A and HADS-D)were used to evaluate the overall symptoms, levels of anxiety and depression respectively.Participants were assessed at baseline and at 6 weeks while the changes in WLQ were assessed biweekly.

Attachments

DOCX

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Guidelines

Principal Investigator, Research Team, and Study Site:

Principal investigator: Yiting Lin

Co-Investigators: Raymond Tsang, Jinzhuo Hu, Ning Zhao, Jinghua Qian

Research team and contact Information:

Study site: Rehabilitation Medicine Centre, School of Sports Medicine and Rehabilitation, Beijing Sport University

Research Synopsis

- **Study Title**

Effects of Online Exercise Intervention on Physical and Mental Conditions in Young Adults with Chronic Neck Pain.

- **Study Population**

The target participants were adults with self-reported non-specific neck pain for more than three months. They were recruited through posters and social media in the campus of the Beijing Sport University.

- **Study Design**

The present study was an assessor blinded randomized controlled trial conducted according to the Declaration of Helsinki (World Medical Association, 2013). The Institutional Review Board of the Beijing Sport University approved the study (reference number: 2023006H).

- **Sample Size**

With an anticipated dropout rate of 15%, a total of 39 participants was required.

- **Study Duration**

Totally 8 weeks, including 1-week baseline testing, 6-week intervention and 1-week post intervention testing.

- **Study Intervention Description**

Participants in both groups completed the same exercise program three times a week for six weeks with either face-to-face or online mode of delivery by physiotherapists.

- **Primary Objective**

The primary objective is to study the effectiveness of online and conventional exercise therapy on pain level and function in adults with chronic neck pain. There were three primary outcomes, including average and maximum neck pain using visual analog scale (VAS), and Neck Disability Index (NDI).

- **Secondary Objectives**

The secondary objectives are investigating the effectiveness of online and conventional exercise therapy on mental condition and working efficacy in adults with chronic neck pain. There were two secondary outcomes: anxiety and depression measured with the Hospital Anxiety and Depression Scale (HADS) and work efficiency assessed with the Work Limitations Questionnaire (WLQ).

Informed Consent Process:

Before participating in the study, physiotherapists will explain this study to all participants to ensure they are clear about this study. Participants can drop out at any time during this study. Then they will complete the informed consent form. All the participants are recruited from Beijing Sport University, China, and they are all native Chinese speakers, so the informed consent form is in Chinese (simplified). All participants should meet the inclusion criteria, and anyone meets the exclusion criteria will be excluded.

- **Privacy and confidentiality:**

Subject's names will be kept on a password protected database, and they will be linked only with a study identification number for this research. There are no patient identifiers. All data will be entered into a computer that is password protected. Data will be stored in a locked office of the investigators and usually maintained for a minimum of three years after the completion of the study.

Risk/Benefit:

- **Risk to participants:**

This is a relatively safe study which has rare risk. Since it is a training for neck muscles, it has possibility of muscle strain and worse neck condition. It has little risk of heart attack and other life-threatening conditions.

- **Benefits to Participants**

This study provides a good exercise plan for the participants which improves their neck functions and decreases their neck pain.

Study Timeline:

- Stage 1, screening, enrollment, ----2 weeks

- Stage 2, treatment phase, ----6 weeks
- Stage 3, data collection and data analysis, -----4weeks
- Stage 4, presentation and publication, ----1 year

Data Safety Monitoring:

All data about participants that is collected during the course of the research will be kept strictly confidential. The data collected with be de-identified before being analysed, and identified data including medical history will be confidential and stored separately. However, confidentiality of participants' data is subject to legal limitations (e.g. subpoena, freedom of information claim, or mandatory reporting in some professions). All data will be kept in locked filing cabinets as well as password protected electronic files. Data will be securely stored for at least three years and may be kept indefinitely.

Conflict of Interest:

No potential conflict of interest.

Publication and Presentation Plans:

Results of this study was used for the graduation thesis and presentation for masters' degree.
Plan to publish 1 SCI paper.

References:

- Beltran-Alacreu, H., López-de-Uralde-Villanueva, I., Calvo-Lobo, C., Fernández-Carnero, J., and La Touche, R. (2018). Clinical features of patients with chronic non-specific neck pain per disability level: a novel observational study. Rev Assoc Med Bras 64(8), 700-709. doi: 10.1590/1806-9282.65.2.291.

- Blanpied, P., Gross, A., Elliott, J., Devaney, L., Clewley, D., Walton, D., et al. (2017). Neck pain: revision 2017. J Orthop Sports Phys Ther 47(7), A1-A83. doi: 10.2519/jospt.2017.0302.

- De Biase, S., Cook, L., Skelton, D. A., Witham, M., and Ten Hove, R. (2020). The COVID-19 rehabilitation pandemic. Age and ageing, 49(5), 696–700. https://doi.org/10.1093/ageing/afaa118

- Fandim, J., Costa, L., Yamato, T., Almeida, L., Maher, C., Dear, B., et al. (2021). Telerehabilitation for neck pain. Cochrane Database of Systematic Reviews (3). doi: 10.1002/14651858.CD014428.

- Havran, M., and Bidelspach, D. (2021). Virtual physical therapy and telerehabilitation. Phys Med Rehabil Clin N Am 32(2), 419-428. doi: 10.1016/j.pmr.2020.12.005.

- Kazeminasab, S., Nejadghaderi, S., Amiri, P., Pourfathi, H., Araj-Khodaei, M., Sullman, M., et al. (2022). Neck pain: global epidemiology, trends and risk factors. BMC Musculoskelet Disord 23(1), 26. doi: 10.1186/s12891-

021-04957-4.

- Nazari, G., Bobos, P., Billis, E., and MacDermid, J.C. (2018). Cervical flexor muscle training reduces pain, anxiety, and depression levels in patients with chronic neck pain by a clinically important amount: A prospective cohort study. Physiother Res Int 23(3), e1712. doi: 10.1002/pri.1712.

- Safiri, S., Kolahi, A., Hoy, D., Buchbinder, R., Mansournia, M., Bettampadi, D., et al. (2020). Global, regional, and national burden of neck pain in the general population, 1990-2017: systematic analysis of the Global Burden of Disease Study 2017. BMJ 368, m791. doi: 10.1136/bmj.m791.

- Seron, P., Oliveros, M., Gutierrez-Arias, R., Fuentes-Aspe, R., Torres-Castro, R., Merino-Osorio, C., et al. (2021). Effectiveness of telerehabilitation in physical therapy: a rapid overview. Phys Ther 101(6), pzab053. doi: 10.1093/ptj/pzab053.

- Santomauro, D. F., Herrera, A. M. M., Shadid, J., Zheng, P., Ashbaugh, C., Pigott, D. M. et al. (2021). Global Prevalence and Burden of Depressive and Anxiety Disorders in 204 Countries and Territories in 2020 Due to the COVID-19 Pandemic. The Lancet, 398, 1700-1712. https://doi.org/10.1016/S0140-6736(21)02143-7

- World Medical Association (2013). World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects. JAMA 310(20), 2191-2194. doi: 10.1001/jama.2013.281053.

- Wu, A., Dong, W., Zeng, X., Xu, X., Xu, T., Zhang, K., et al. (2021). Neck pain is the leading cause of disability burden in China: findings from the Global Burden of Disease Study 2017. Ann Transl Med 9(9), 777. doi: 10.21037/atm-20-6868.

- Xu, Y., Wang, Y., Chen, J., He, Y., Zeng, Q., Huang, Y., et al. (2020). The comorbidity of mental and physical disorders with self-reported chronic back or neck pain: results from the China Mental Health Survey. J Affect Disord 260, 334-341. doi: 10.1016/j.jad.2019.08.089.

- Zronek, M., Sanker, H., Newcomb, J.,&Donaldson, M. (2016). The influence of home exercise programs for patients with non-specific or specific neck pain: a systematic review of the literature. J Man Manip Ther, 24(2), 62-73. doi: 10.1179/2042618613Y.0000000047

Supplementary file 1. The assessment of 15 repetitions maximum of exercises of Modified Brügger's Exercise and Modified Proprioceptive Neuromuscular Facilitation Diagonal Flexion Exercise

A. Modified Brügger's Exercise (MBE)

The subject was seated in a starting position for shoulder adduction (90° flexion of the elbows; supination of the forearms). The Thera-band® was wrapped around the subjects' hands and kept tight. The subjects performed scapular retraction and external rotation of shoulder joint. Afterwards, the subjects straightened the elbows and abducted shoulders, and then gradually recovered to the starting position.

B. Modified Proprioceptive Neuromuscular Facilitation Diagonal Flexion Exercise (MPNFDFE)

The subject was seated in a starting position with their hands grasping the Thera-band® and placing on their legs, shoulders in internal rotation, scapulars in protraction, forearms in pronation, and fingers in flexion. Then they performed one sided scapular retraction, shoulder flexion, abduction and external rotation. At the meantime, they did a trunk rotation. After that they slowly returned to the starting position and did the other side.
The most appropriate training intensity for the subjects was: the participant could complete 15 times, with a rating of perceived exertion (RPE) of 15 points (hard/heavy) on the 15-grade Borg RPE scale as shown in Figure S1, and does not cause neck pain.

Score	Perceived Exertion	Chinese Definition
6	No exertion at all	一點也不費力
7	Extremely light	極度輕鬆
8		
9	Very light	很輕鬆
10		
11	Light	輕鬆
12		
13	Somewhat hard	有點困難
14		
15	Hard (Heavy)	困難
16		
17	Very hard	很困難
18		
19	Extremely hard	極度困難
20	Maximal exertion	已盡最大努力

Figure S1. the Borg RPE 6–20 scale with Chinese verbal descriptors

Supplementary file 2. Exercise program

A. Warm up exercises

In the warm-up phase, the participant should slowly perform neck flexion, extension and lateral flexion to the end of the range of motion, with 10 times in each direction. Then he or she would perform circumduction of shoulder joint for 10 times.

B. Cranio-cervical flexion exercises

Training volume: 190 seconds in total, hold in each movement for 10 seconds, rest for 10 seconds, and with repetitions of 10 times.
There were 7 movements in total (from A to G), four of which were performed in each training session. In the first two weeks, the movements (A), (B), (D) and (E) were performed, in the third and fourth weeks, the movements (A), (C), (E) and (F) were performed, and in the fifth and sixth weeks, the movements (C), (E), (F) and (G) were performed.
(A) Chin retraction in supine position
(B) Chin retraction in sitting position
(C) Chin retraction in sitting position and turning head left and right consecutively
(D) Four kneeling position with chin retraction
(E) Chin retraction against the wall in standing position
(F) Chin retraction in standing position with turning head left and then right consecutively
(G) Chin retraction against the towel behind neck in supine position

C. Strength-endurance exercises

Training volume: hold in each side for 10 seconds (left, right and back), with repetitions of 10 times for each.
(1) Lateral neck muscles: the participant sat with chin retraction, then complete one side isometric lateral flexion against manual resistance for 10 seconds. Then this was repeated in another side alternatively.
(2) Back neck muscles: the participant sat with chin retraction. The Thera-band® was placed at the back of the head and held in both hands. Then an isometric backward head extension against the resistance of the Thera-band® was performed for 10 seconds. The holding distance of the band from the hands should be adjusted to achieve suitable resistance during the exercise.

D. Scapular stabilization exercises

Training volume：15 repetitions of the resistance of 15RM initially determined were performed for each movement. There was rest of one minute between each movement. If the participant could perform the exercise without difficulty, then he or she could increase the resistance of Thera-band® accordingly.
There were 6 movements in total, with three of which being performed in each training. Each movement was performed for 1 set in the first four weeks, and 2 sets in the last two weeks. In the first two weeks, the movements (1), (2) and (3) were performed, and in the third and fourth weeks, the movements (4), (5) and (6) were performed. In the last two weeks, the movements (4), (5) and (6) were performed in two sets.

(1) Side-lying shoulder external rotation:

- in side lying with arms close to the trunk
- both hands holding the Thera-band® with the elbow flexed to 90°
- external rotation of the shoulder to full ROM

(2) Prone T exercise

- in a prone position with shoulder 90° abduction, like a letter "T"

- lifting the hands toward the ceiling, bringing both shoulder blades together
- head and neck in neutral position

(3) Y-to-I exercise

- in a prone position with shoulder 120° abduction, like a letter "Y"
- shoulder blades retraction with the hands lifting toward head, forming a letter "I"

(4) Unilateral row

- in standing position, one arm holding the resistance band, then with the shoulder blades retraction slowly to drive the upper arm to perform shoulder extension and elbow flexion, completing a rowing movement
- the action was maintained 2 seconds at the end range of retraction, then the action was slowly released with shoulder and arm returning to the starting position

(5) Reversed flies

- the resistance band holding in both hands in standing position
- then straight arm shoulder horizontal abduction was performed against the resistance with shoulder blades retraction
- the action was maintained 2 seconds at the end range of retraction, then the action was slowly released with shoulder and arm returning to the starting position

(6) Lateral pulldown

- the resistance band secured stably above the head
- the resistance band was pull down with both hands with elbow extended
- the shoulder blades retraction with shoulder adduction and extension
- the action was maintained 2 seconds at the end range of retraction, then the action was slowly released with shoulder and arm returning to the starting position

E. Stretching exercises

The sternocleidomastoid, levator scapulae, pectorals minor and pectorals major were stretched, 30 seconds for one muscle.

Troubleshooting

Attachments

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Files

SEARCH

Protocol

NAME

Background and Significance (Part 1 of "Effects of Online Exercise Intervention on Physical and Mental Conditions in Young Adults with Chronic Neck Pain")

VERSION 1

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Objectives (Part 2 of "Effects of Online Exercise Intervention on Physical and Mental Conditions in Young Adults with Chronic Neck Pain")

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Study design/methodology (Part 3 of "Effects of Online Exercise Intervention on Physical and Mental Conditions in Young Adults with Chronic Neck Pain")

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Study Population (Part 4 of "Effects of Online Exercise Intervention on Physical and Mental Conditions in Young Adults with Chronic Neck Pain")

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Interventions (Part 5 of "Effects of Online Exercise Intervention on Physical and Mental Conditions in Young Adults with Chronic Neck Pain")

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Study Schedule (Part 6 of "Effects of Online Exercise Intervention on Physical and Mental Conditions in Young Adults with Chronic Neck Pain")

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Adverse Event Reporting (Part 7 of "Effects of Online Exercise Intervention on Physical and Mental Conditions in Young Adults with Chronic Neck Pain")

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Statistical Analysis Plan (Part 8 of "Effects of Online Exercise Intervention on Physical and Mental Conditions in Young Adults with Chronic Neck Pain")

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