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Effects of Exercises in Grip Strength and Wrist Stability on Pain and Function in Patients with Nonspecific Chronic Wrist Pain

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ABSTRACT

Non-specific chronic wrist pain is defined as wrist discomfort that does not have a specific cause, such as trauma. It can compromise function, muscular strength, and grip strength by limiting the range of motion of the wrist and hand joints. The purpose of this study was to ascertain the impact of wrist stability training in conjunction with grip-strengthening activities on wrist pain and function in individuals with non-specific chronic wrist pain. Thirteen people suffering from wrist pain were the study's subjects. Exercises designed to enhance the grip in conjunction with wrist stability training were administered to 15 participants and 16 control subjects in order to assess the impact of the combination. The experimental group engaged in training related to wrist stability. For four weeks, 20 minutes a day, twice a week, were dedicated to grip-strengthening exercises and wrist stability training. Additionally, relaxation massage and conservative physical therapy were scheduled during this time. For four weeks, the control group underwent conservative physical therapy and relaxation massage for forty minutes each day, twice a week. The degree of discomfort was assessed using a visual pain scale both before and after therapy, and the function of the wrist was assessed using a patient-rated wrist examination. The patient-rated wrist evaluation considerably lowered ($p<0.001$), grip strength and muscle strength significantly increased ($p<0.001$), and the visual score dramatically decreased in the time effect before and after the intervention in both groups.

Keywords: Sports, Public health

INTRODUCTION

Due to the widespread use of computers in modern culture, wrist strain from repetitive motion is increasing on a daily basis, which is contributing to a rise in wrist pain. Because the wrist is a bilateral joint that is positioned differently during functional tasks, it can become painful when it is subjected to different kinds of stress, including load pressure, twisting, and tugging. Ankle or ligament inflammation, fractures, traumatic stress injuries, and other related diseases can all cause specific wrist pain. On the other hand, general discomfort that does not stem from a particular anatomical structure or activity is referred to as non-specific wrist pain. For example, those who use their wrists a lot and are under stress in their daily lives, such drivers, cheerleaders, physical education teachers, musicians, and sports, are more likely to experience non-specific chronic wrist discomfort. Due to a variety of sports and recreational activities as well as excessive job demands, there is currently a rise in patients with non-specific wrist pain. Pronation, supination, radial deviation, and ulnar deviation are among the wrist motions. A controlled, relatively stable system of muscles, tendons, and ligaments is needed to achieve motion. Decreases in grip strength, gripping ability, fine manipulation, and hand function can result from restrictions in the range of motion of the wrist and hand joints, which are typically brought on by wrist discomfort, edema, muscular weakness, or disability causes. As a result, measuring the joints' Range of Motion (ROM) is crucial to the assessment of wrist joints since it enables the determination of the extent of damage and the assessment of the hand. Due to a variety of sports and recreational activities as well as excessive job demands, there is currently a rise in patients with non-specific wrist pain. Flexion and extension, pronation, supination, radial deviation, and ulnar deviation are examples of wrist movements. A controlled, relatively stable system of muscles, tendons, and

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Reduced grip strength, gripping ability, fine manipulation, and hand function can result from restrictions in the range of motion of the wrist and hand joints, which are typically brought on by wrist discomfort, edema, muscular weakness, or handicap causes. As a result, measuring the joints' Range of Motion (ROM) is crucial to the assessment of wrist joints since it enables the determination of the extent of damage. Due to a variety of sports and recreational activities as well as excessive job demands, there is currently a rise in patients with non-specific wrist pain. Flexion and extension, pronation, supination, radial deviation, and ulnar deviation are examples of wrist movements. A controlled, relatively stable system of muscles, tendons, and ligaments is needed to achieve motion. Reduced grip strength, gripping ability, fine manipulation, and hand function can result from restrictions in the range of motion of the wrist and hand joints, which are typically brought on by wrist discomfort, edema, muscular weakness, or handicap causes.

DISCUSSION

In addition to keeping the body safe from harm and promoting the repair of injured tissue, pain is defined as unpleasant sensory and emotional experiences connected to tissue damage or injury. Since they frequently do not know how to relieve pain, many people with chronic pain suffer from significant continuing agony that causes both physical and emotional problems. The purpose of this study was to assess pain changes resulting from wrist stability training and grip-strengthening activities. Following therapy, there was a significant reduction in the visual pain scale throughout the group, as evidenced by the scores falling from 4.23 to 1.87 points ($p<0.001$). In the experimental group, the time × group interaction resulted in substantial differences ($p<0.001$). 66 workers with chronic pain took part in an experiment, to examine the impact of strength training on fatigue resistance and self-rated health in these individuals. According to the results, there was a substantial 41% decrease in pain ($p<0.05$) from 2.4 to 0.8. Nevertheless, there were no discernible statistically significant variations between the groups. Wrist pain, function, and joint position perception in female gymnasts with non-specific chronic wrist pain were examined in relation to highpower laser therapy in conjunction with exercise. Thirty-six female gymnasts participated in the study; they were split into three groups: exercise program, laser therapy, and combination therapy (exercise and laser therapy). There were substantial differences between the exercise program, laser therapy, and combination therapy groups ($p<0.05$), and all three groups displayed differences within the groups ($p<0.05$). But there was no discernible difference between the groups receiving laser therapy and the exercise regimen. The time × group interaction effect on the improvement of wrist function showed a significant difference in this study ($p<0.001$). According to research, wrist stability exercise enhances muscle activation, stabilizes unstable joints, and successfully reduces discomfort related to musculoskeletal issues like osteoarthritis. Exercises for the wrists strengthen the ligaments in addition to the muscles and tendons that surround the wrist joint. So, doing grip-strengthening exercises along with wrist stability training strengthens the wrist and improves its function more than not exercising does, giving the wrist a sensation of stability when using it on a regular basis. It is thought that this particular strategy will improve wrist function more effectively. It is important to take into account the many limitations of this study when evaluating the findings. The small sample size of 31 individuals in this study limited how far the results could be applied. Furthermore, wrist pain was noted in both the dominant and, to a lesser extent, the non-dominant hands. Because the trial only lasted four weeks, the experiment was conducted in a small clinic in a specific region, further limiting the results' capacity to be applied to a larger population. As a result, there wasn't enough time to show how long-term exercise programs worked. Furthermore, it was challenging to get appropriate answers to some of the evaluation questionnaire's items that assessed wrist function since they required actions that the participants might not have tried before. One additional constraint was the challenge of accurately ascertaining the efficacious treatment due to the diverse range of treatment recommendations in the hospital environment. It is vital to design a long-term experimental intervention strategy and recruit a greater number of participants in light of these restrictions. The effectiveness of wrist stability training in conjunction with grip-strengthening exercises could be further validated by limiting the use of other prescribed medications or therapies outside of the experimental intervention and by conducting the study in multiple regions.

CONCLUSIONS

The purpose of this study was to examine how wrist stability training and grip-strengthening exercises affected the patients' pain, function, and range of motion in relation to nonspecific chronic wrist pain. For four weeks, both groups had twice-weekly, 20 minute-40 minute sessions of conservative physical therapy and relaxation massage. Over the course of the same four weeks, grip-strengthening activities and wrist stability training were also performed twice a week for 20 minutes each. Before and after the intervention, there were noticeable changes in discomfort, function, range of motion, grip strength, and muscular strength**.** This study showed that in individuals with non-specific chronic wrist pain, grip-strengthening exercises along with wrist stabilization training improve pain, wrist function, grip strength, and muscular strength. Wrist exercise intervention should be prioritized in clinical practice going forward as a treatment strategy for enhancing grip strength, muscle strength, pain, and function in patients with non-specific chronic wrist pain. An efficient intervention strategy could involve combining the grip-strengthening exercises used in this study with wrist stabilization training.