

ORIGINAL ARTICLE

Investigation of the Effects of Exercise and Kinesio Banding on the BackacheEMRAH YILMAZ¹, ABDULSAMET EFDAL²¹Dr. Lecturer, Department of Coaching Education, Faculty of Sport Sciences, Hitit University, Çorum, Turkey.E-mail: dremrahylimaz@hotmail.com, emrahylimaz@hitit.edu.tr, ORCID:<http://orcid.org/0000-0002-0857-5015>²Prelector, Department of Environmental Health Program, Vocational School of Health Services, Hitit University, Çorum, Turkey.E-mail: sametefdal@hotmail.com, ORCID:<http://orcid.org/0000-0001-8325-2438>**ABSTRACT****Introduction.** This study aims to investigate the effects of Kinesio banding on backache and flexibility in addition to exercise therapy for sedentary women with chronic mechanical backache.**Material and methods.** A total of 20 sedentary women participated in the study voluntarily. The women in the subject group were applied both Kinesio band and exercise, while the control group was applied only the same exercise program as the subject group.**Results.** The results of statistical analysis revealed that exercise and Kinesio banding created a more positive difference in flexibility and backache values in the subject group compared to the control group ($p < 0.05$). It was determined that the application of the Kinesio band applied together with exercise is a more effective method in sedentary women with chronic backache.**Conclusions.** We think that continuing the study with more participants and for a long time will make significant contributions to the literature by producing more positive results.**Keywords:** Backache, Kinesio banding, Exercise, Flexibility, Sedentary women.**INTRODUCTION**

Backache is a discomfort that all people encounter at some point in their lives, and it is reported to be seen in approximately 70-84% of the world population. It is stated that this rate is around 49-79% in our country^{1, 10, 29}. Initially, it is in the form of acute pain, and it is emphasized that it becomes a chronic form according to the degeneration level and negatively affects the functionality and causes a decrease in the quality of life. In developed societies, backache is one of the main factors that cause an inability to work and morbidity^{4, 5}. Chronic backache is defined as pain that is felt in the lumbosacral region of the vertebral column (spine), sometimes accompanied by hip and leg pain, and continues for more than 12 weeks⁶.

Although the cause of chronic backache cannot be based on a complete pathology, many factors are known to cause this pain either alone or together. The main factors that determine the severity of mechanical backache are; physical structure, psychosocial factors, sociodemographic features, lifestyle, static study posture, and repeated activities that develop depending on working in the same position continuously⁷. Backache is among the health problems that housewives frequently complain of⁸. Studies show that housewives play an important role in the etiology of backache, such as waist bending, frequency of overhead activities, unconscious weight lifting, and in-home ergonomic deficiencies during performing various indoor activities such as ironing, using vacuum cleaners⁹.

In recent studies, it is emphasized that 90% of backache will pass without any conservative treatment or surgical method. It is observed that individuals who have backache for a certain period prefer a lifestyle away from the movement. Due to backache, weakness occurs especially in the abdominal region and back muscles due to avoiding some movements. Muscles that weaken in the form of a vicious circle push the person more into immobility and weak muscles cause an increase in pain. Mechanical problems causing backache include weakness of the abdominal and back muscles, as well as occupational factors and excess weight or obesity^{10, 11, 12}. The main purpose of the treatment in backache is to prevent the possible injuries that you can take under control as soon as possible without getting a chronic state of pain and to restore the former functioning¹³. Treatment of chronic low back pain, although rare, includes surgical treatment methods such as surgery. But both are for multidisciplinary treatment methods. from conservative treatments; physical therapy modalities (hot-cold applications, electrotherapy, ultrasound, massage, biofeedback, traction, etc.) and other alternative

medicine used in kinesiological banding methods, acupuncture, hijama-cup therapy, dry needling, manipulation methods are applied^{14, 15, 16}.

The exercise program used in the treatment of chronic backache includes other treatment modalities and techniques; Pain management plays a major role in strengthening the muscles and increasing functionality and flexibility^{17, 18}. Various exercise practices have been described in chronic backache. Among them; we can count strengthening exercises, stabilization exercises, stretching exercises, pilates, posture control exercises, and yoga. Exercise programs strengthen the treatment, even more, when applied with other physical therapy modalities. It is especially emphasized that the exercise program has a very important place in the chronic low back pain treatment protocol^{19, 20, 21}.

Kinesiological banding technique was an expert in acupuncture and chiropractic in 1973. Developed by Kenzo Kase. The most important feature of this method is that by applying an elastic band that adapts to the structure and elasticity of the skin without limiting any joint movement, positive results can be obtained both in individuals and in healthy individuals²². Its use in the Beijing 2008 summer Olympics has led to the international recognition of the kinesiological band²³, and the interest in the kinesiological band has been increasing day by day²⁴. It is reported that more than 150 thousand medical practitioners use the kinesiological taping technique as a treatment method²⁵. Dr. Kase states that the source of the problems in the bowl musculoskeletal system is muscle dysfunction and that the kinesiological banding applied to the muscle is more effective than the immobilization of the joint by bandaging around the joint. Any injury or excessive use of the related muscle causes various impairments in the elasticity of the muscle. Kinesiological bands are similar in structure to the elastic tissue of the muscle, and with their adhesive properties, they remove the skin from the tissue under it and are designed to allow the skin to breathe thanks to the pores on these elastic bands. It is reported that with the upward movement of the skin, a dense blood and lymph flow is provided to that area, thereby reducing the pain. Dr. Kase explains this mechanism of bowl pain reduction as the kinesiological band inhibits pain transmission at the spinal level by the gate control theory²². Kinesiology banding techniques are not only used in musculoskeletal system problems, but they also contribute to the circulatory system. Studies that are not only used for the treatment of health problems, but also to prevent injuries and injuries, show that it has a pain-reducing aspect and thus increases functionality^{26, 27}.

In some studies, the effect of kinesiological banding on pain and various physical parameters in acute and chronic backache

was examined^{28,29}. Kinesiological taping method; It is used in many places such as musculoskeletal problems, vascular problems, neurological problems, and peripheral nervous system disorders³⁰. In the literature, it is observed that the Kinesiological banding technique applied to people with backache significantly decreases backache, increases mobility in the lumbar region, and increases the quality of life accordingly^{31, 32, 33}. When the literature is examined again, in terms of effects on backache; studies are comparing the kinesiological banding method or other treatment modalities with the exercise or only the results of the application of the kinesiological band^{31, 32, 33, 34}. This study aims to investigate the effects of Kinesio banding on low back pain and flexibility in addition to exercise therapy for sedentary women with chronic mechanical backache.

MATERIALS AND METHODS

Participants. This study was carried out in Çorum Municipality Mevlana Sports Hall. A total of 20 women voluntarily participated in the study during the 4-week study period, and were divided into an equal number of subjects and control groups. The groups were randomly selected, all women were informed before the study and the voluntary consent form was signed. Kinesio and exercise were applied to women in the subject group. The control group participated in the exercises only with the subject group.

Exercise protocol. Step Aerobics, Pilates, and Static Stretching Exercises were applied to all women participating in the study for 4 weeks. Aerobic exercise was applied 2 days a week, 45 minutes in total, with a moderate intensity. Pilates Exercise was applied once a week, 30 minutes in total. Stretching Adolescent was applied 5-10 minutes after Aerobic and Pilates exercises 3 days a week. The applied stretching exercise and pilates exercise movements were applied considering the low aches.

Kinesio Band Application. The Kinesio Band was applied to 10 women in the Subject group 2 days a week for 4 weeks. The Kinesio bands are set at a width of 5cm and a length of 20cm and

are glued according to muscle technique and in the form of I tape. Kinesio band was applied at the time when the body of the women was dry after the exercises that were made at the time of application.

Measurements: Taking the anthropometric measurements (height, weight, body mass index) of the participants, Visual Analogue Scale (VAS) was used before, during the second week of the study, and after the study to determine the severity of the pain felt in the waist areas. Volunteers were subjected to sit-and-stretch flexibility tests, straight leg lift tests, static and dynamic force, and endurance tests before and after the study.

Ethical considerations: The present study was approved by the Research Ethics Committee of the Hitit University of Medical Science and All procedures performed in this study on human participants were in accordance with the ethical standards of the institution and the national research committee, as well as with the 1964 Helsinki declaration and its later amendments and comparable ethical standards.

Statistical Analysis: The findings obtained in the study were analyzed in the IBM SPSS 22.0 (Statistical Package for the Social Sciences) statistical analysis program. Descriptive statistical data were presented by taking the arithmetic mean (\bar{x}) and standard deviation (SD) values. Shapiro-Wilk test was performed to determine whether the data showed normal distribution. Since the data did not show normal distribution, the WilcoxonSignedRank test protocol was used to compare the pre-test averages before and after the Kinesio band application, using the one-way Anova test protocol to compare the post-test averages. In statistical analysis, the significance level was accepted as $p < 0.05$.

RESULTS

The comparison of the data of the experimental and control groups before and after the application was presented in Table 1.

Table 1: Comparison of the control and experimental group parameters before and after application.

| Variable | Group | Pretest | Post-test | z | p |
|------------------|--------------|--------------|--------------|--------|--------|
| | | X ± SD | X ± SD | | |
| Body Weight (kg) | Experimental | 80,80 ± 10,7 | 80,50 ± 9,9 | 1,000 | 0,317 |
| | Control | 81,80 ± 10,7 | 81,20 ± 10,1 | 1,414 | 0,157 |
| BMI (kg/m2) | Experimental | 31,11 ± 4,19 | 32,66 ± 4,52 | -0,943 | 0,345 |
| | Control | 32,66 ± 4,52 | 32,41 ± 4,18 | -1,483 | 0,138 |
| Elasticity (cm) | Experimental | 19,45 ± 5,94 | 23,20 ± 6,32 | -2,810 | 0,005* |
| | Control | 26,75 ± 5,48 | 29,40 ± 5,26 | -2,814 | 0,005* |
| VAS. | Experimental | 6,40 ± 2,22 | 2,40 ± 0,96 | -2,809 | 0,005* |
| | Control | 5,30 ± 2,05 | 2,80 ± 1,22 | -2,314 | 0,005* |

* $p < 0.05$

Table 2: Comparison of the post-application averages of the experimental and control groups

| Variable | Experimental X ± SD | Control X ± SD | f | p |
|------------------|------------------------|-------------------|--------|--------|
| Body Weight (kg) | 80,50±9,90 | 81,20±10,07 | 0,268 | 0,612 |
| BMI (kg/m2) | 31,00±4,16 | 32,41±4,18 | -0,108 | 0,746 |
| Elasticity (cm) | 23,20±6,32 | 29,40±5,26 | 0,989 | 0,334 |
| VAS. | 2,40±0,96 | 2,80±1,22 | 4,551 | 0,047* |

* $p < 0.05$

According to the results of the statistical analysis, while there was no statistically significant difference in the body weight and BMI pre and post-test averages in the experimental group ($p > 0.05$), a statistically significant difference was detected between the pain pre and post-test mean scores. When comparing the pre-test and post-test means of the control group, there was no statistically significant difference between the body weight and BMI pre-test and post-test mean ($p > 0.05$), a statistically significant difference was found between the pretest and post-test mean

scores ($p < 0.05$). According to the results of the analysis, a significant decrease was found in the posttest pain score average.

According to the results of ANOVA analysis conducted by covariate the pre-test averages of the experimental and control groups, there was no statistically significant difference between the groups in terms of body weight, BMI, and flexibility post-test averages ($p < 0.05$).

DISCUSSION

Age is shown as the biggest risk factor for backache. In the literature, it is reported that the decade with the highest incidence of backache is the third decade, and the peak during the prevalence is between the ages of 60-70³⁵. In their study, stated that with increasing age in our country, backache complaints increased in parallel with age³⁶.

In their study, O'Sullivan et al. found the average age of patients with chronic backache as 44.3³⁷, while Krein et al. found 52.3 for those who did not use analgesic drugs (50.7)³⁸. It is seen that the average age of our research group is similar to the literature.

Dundar et al. reported in a study on chronic backache that there was no gender difference between the control group and the group without backache, but women were the majority in the group with backache⁹. De Palma et al. chronic showed that 34.9% of the group was male and 65.1% were female in their studies on backache³⁹. Therefore, we created the participants from the women in our study.

In studies related to chronic backache, it is seen that the participants' body mass index (BMI) averages are at the level of obesity^{37, 38}. In our study, our participants consist of 1st-degree obese individuals as in the literature.

The effectiveness of exercise in the treatment of chronic backache has been proven by many studies; the study conducted by Sari et al. emphasizes that the exercise program has positive effects on pain, muscle strength, flexibility and performing daily life activities and that exercise should be especially in the treatment of backache⁴⁰. In a 4-week study in which Rydeard et al. examined the effectiveness of exercise in individuals with chronic backache, randomly divided participants between the ages of 20-55, into 2 groups, while the other group received medical assistance only when needed. At the end of the study, they reported that exercise significantly reduced physical disability caused by chronic backache⁴¹.

In a study in which Paoloni et al examined the effectiveness of exercise and kinesiological taping in chronic backache, pain assessment was performed with a visual analog scale (VAS). After the participants were randomly divided into 3 groups, the exercise group was applied to one group, kinesiological band technique was applied to one group, while both the kinesiological band and exercise program was applied to the other group. At the end of the 4-week study, there was a decrease in the level of pain in all 3 groups, while kinesiological banding was reported to cause a decrease in the level of pain in a short time²⁸. In a study investigating the effectiveness of Pilates exercises and waist exercises in chronic backache, three pain assessments were performed before working with VAS, 1 month after the study and 3 months after the study. It was stated that pain decreased significantly in both types of exercise³⁴. As in the literature, the effects of aerobic and static stretching exercises applied to backache assessed in our study caused a significant decrease in both groups. Pain level was found to be significantly lower compared to the exercise group alone.

Decreases in flexibility cause tension in the muscles, causing more energy to be consumed and more fatigue during muscle contraction. In studies evaluating flexibility with exercise applications, a significant increase in flexibility was reported⁴². In a study conducted by Segal et al. 47 men, two of whom were male, had undergone pilates exercise for 2, 4, and 6 months. It was reported that the flexibility of all participants increased⁴³. In a study comparing the effects of different exercises on trunk flexibility, flexibility values evaluated by the finger-ground test increased in both exercises, but motor control exercises were reported to be more effective than classical exercises⁴². While there was a significant increase in flexibility in both groups in our study; There was no significant difference between the two groups.

In a study conducted by AlBahel et al. on the effect of kinesiological banding on mechanic backache they reported that the kinesiological banding technique significantly reduced pain⁴⁴. Another study conducted by Özkan, 40 participants, consisting of 30 women and 10 men, were randomly divided into 2 groups, one being taping and the other being a control group. While electrotherapy and exercise were applied to the control group, kinesiological banding was also applied to the experimental group. While there was a significant decrease in activity and night pain in the assessment of pain with VAS in the banding group, no significant difference in resting pain was observed. In the control group, there was a significant decrease in all three pain levels. It was reported that there was no significant difference between the groups⁴⁵.

CONCLUSION

In conclusion, we believe that aerobic, static stretching and pilates exercises applied in this study have positive effects on backache. Besides, it is seen that exercises applied to the subject group and Kinesio banding have positive effects on individuals. It is thought that these exercises, which will be applied in individuals with chronic backache, will significantly reduce the symptoms of backache in individuals. Kinesio banding therapies, which will be performed together with exercise on backache, have also been observed in this study, which will cause relief in people with chronic backache. In our studies, we support our study and we think that we contribute to the literature with this study. Backache has been stated in the literature that it is more effective for women for various reasons, and we think that Kinesio band application will be effective to decrease this effect or to decrease it to minimum levels. It is thought that this study will contribute more to the field by diversifying with different numbers of subjects and different types of exercise in different age groups.

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