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The effect of kinesio taping on neck pain in academicians

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Abstract

Pain in the neck is one of the oldest and most common problems known to man. Neck pain is generally defined as a feeling of discomfort felt in the side and back of the neck. This study aimed to investigate the effect of KT on neck pain in academicians with neck pain. We aimed to investigate the effectiveness of taping by using the Bournemouth Neck Questionnaire before and after to evaluate neck pain. A total of 40 people, 18 male, and 22 female participated in the study. Academicians with neck pain were included in our study. Demographic information such as age, height, weight, gender, regular sports habits, daily smoking, and chronic disease status was questioned. "Y" and "I" bands were applied to the participants. The "Y" band was applied to the lower end of the cervical 7th vertebra (Vertebra Prominens) with submaximal tension, and the other two ends were applied to the right end of the right end to the proc. mastoideus of and temporal bone the left end to the processus (proc.) mastoideus of the left temporal bone. The "I" band was applied to the pars transversa of the trapezius muscle with moderate tension. The applied bands remained on the participants for 72 hours (3 days). In addition, the Bournemouth Neck Pain Questionnaire consisting of 7 questions was applied to the participants, questioning the intensity of pain, inadequacy in activities of daily living, inadequacy in social activities, anxiety, emotional aspects of depression, kinesiophobia, and ability to control pain. The Bournemouth Neck Pain Questionnaire was administered twice before and 10 days after the taping procedure and the results were compared. It was observed that the Bournemouth Neck Pain Scale scores before taping were higher than after taping in the participants included in the study. The decrease in Bournemouth Neck Pain scale scores after taping was statistically significant ($p=0.001<0.05$). There was no statistically significant difference in the Bournemouth Neck Pain Scale scores between those who do and do not do regular sports before taping ($p>0.05$), but a statistically significant difference was found after taping ($p<0.05$). It has been concluded that KT is an effective method in the treatment of neck pain in academics who spend a long time at the computer and desk. We believe that the study will contribute to clinicians, researchers and the literature.

Keywords: Neck pain, kinesio taping, physical therapy and rehabilitation

Introduction

Computer and internet technologies have been rapidly developing and spreading over the last hundred years. This developing with technology, internet use has become an indispensable tool of life [1]. In addition, it has caused human beings to lead a much more sedentary life compared to the past [2]. Depending on

technological developments, the use of computers in offices and workplaces has increased, and Long-term computer use has also developed in employees, and long-term computer use brings along some health problems [3]. These health problems include stressful lifestyle, less movement, change in eating habits, and staying in a fixed posture for a long time have caused deterioration of body mechanics and posture [2].

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Musculoskeletal system diseases due to prolonged computer use in a fixed position; repetitive stresses in the work environment of individuals working in an inappropriate posture a series of injuries involving muscle, tendon, ligament, nerve, joint, cartilage, bone, and vascular tissues belonging to the body dynamics of the arm, leg, neck, back and waist regions develop as a result of exposure [4]. Deteriorated body dynamics, especially in the regions exposed to continuous stress in the musculoskeletal system, such as the waist, neck, and shoulder girdle, appear with various symptoms, especially pain sensation [5].

Musculoskeletal system diseases are very common, affecting all age groups and genders, and are an important health problem that causes disability and loss of strength. Related to the musculoskeletal system, problems usually manifest as pain. Although these problems are not fatal, they reduce quality of life and decrease economic productivity [6]. In 2004 a population-based study conducted in the USA reported that 80% of the population between the ages of 15 and 84 defined musculoskeletal pain at least once in their lifetime and that the problem has reached almost epidemic proportions [7]. One of the most common health problems in individuals working at a desk is musculoskeletal pain due to repetitive stress and incorrect posture developing neck pain [8]. The neck is an important region that protects many vital structures and connects the head and body parts of our body between our jaw joint and collarbone [9]. Pain felt in the neck region is human It is one of the oldest and most familiar problems in history [5]. In the 21st century, neck pain is a problem that develops in certain periods of the lives of a large proportion of people in their daily lives. It is seen as a disorder that negatively affects their activities [10].

Neck pain is one of the most common and recurrent musculoskeletal diseases in the community after low back pain. In addition, it is a problem that can be experienced by all age and gender groups, affecting the social life of the person, and causing a decrease in productivity and an increase in treatment costs [11]. Seventy percent of people complain of neck pain at least once in their lifetime. The prevalence of symptoms lasting for one year varies between 1.7% and 11.5%. Neck pain is mostly seen in people with poor posture who work at a desk and in healthcare workers [12]. Prolonged isometric contractions cause excessive stress in the muscles and are more common in desk workers, especially those with inappropriate sitting postures position, non-ergonomic arrangements, working conditions bring problems in the musculoskeletal system. Problems related to the musculoskeletal system affect work efficiency and quality of life and cause loss of work and economic losses [13].

In the studies conducted, long-term have shown that working at a computer is a factor affecting neck pain [14]. The anatomical structure of the neck region is at the forefront in the frequent occurrence of neck pain. The neck region has a highly mobile structure due to its anatomical structure. Although the mobility of this region has many advantages, it is also a region that is

open to injury [15]. Neck pain is generally defined as a feeling of discomfort felt in the lateral and posterior regions of the neck [16].

In recent years, neck pain has been observed more frequently in our society as a result of occupational diseases and in-vehicle accidents. In the literature, it is reported that the frequency of neck pain is gradually increasing and it is more common in women than in men [17]. In a study, the lifetime prevalence of neck pain was found to be approximately 67-71% and this was found in one third of the individuals two of them have encountered neck pain at least once [18]. Neck pain is observed in 22% of the population. It has been reported that 44% of patients consult a physician due to the chronicization of pain [19]. The general cause of pain in the neck region is due to strain, sprain or inflammation [20].

Today, many methods are used for the treatment of musculoskeletal pain. There are studies suggesting that Kinesio Taping, one of these methods, reduces neck pain [21]. From this point of view, KT reduces pain and improves functionality. It is thought that it may be an alternative treatment modality to increase the number of patients [22].

Especially academicians perform their work in a computer environment, so we think that they will be more prone to skeletal and muscular diseases. The aim of this study was to investigate the effect of KT on neck pain in academicians with neck pain effect on neck pain. We aim to investigate the effectiveness of taping by using the Bournemouth Neck Questionnaire before and after KT to evaluate neck pain.

Material and Method

Our study was conducted among 24-55-year-old academician (18 male and 22 female) volunteers who filled out an informed consent form. Participants were recruited from Malatya Turgut Özal University Interventional Clinic Approval from the Research Ethics Committee 2022/42 was obtained. Academicians with pain in the neck region were included in our study. In addition, attention was paid to the fact that the participants did not have a history of deformity or congenital deformity in the neck region. In the neck region; Individuals with neck joint instability, trauma in the past year, severe osteoporosis, previous neck surgery, positive “spurling” or “cervical distraction” test, neck flattening and cervical disc herniation were not included in the study. Again, individuals who received physical therapy and rehabilitation in the last six months did not participate in the study.

In the demographic questionnaire, age, height, weight, gender, regular sports habits, daily smoking and chronic disease status were questioned.

Actions taken

KT was applied to the back of the neck of the participants. Participants completed the Bournemouth Neck Pain Questionnaire to find out the effectiveness of the taping procedure.

KT was applied by a physiotherapist certified in the taping method. The kinesiological taping technique (The Kinesio Taping® technique) and kinesiological tape (Kinesio Tex® tape) were developed in 1973 by Japanese chiropractic and acupuncturist Dr.

It is a method developed by Kenzo Kase. The kinesiological tape has been developed to reflect the characteristics of the skin, and its thickness corresponds to the epidermis layer of the skin. Its elasticity to the human is similar to the elastic properties of the skin. The bands are longitudinally the same as it does not show a transverse stretching feature while extending up to 55-60%. Tapes can be used for different treatment purposes and are applied in different tensions. The bands can be stretched by approximately 60%. Tension levels are defined as maximal stretching (100%), submaximal stretching (75%), moderate stretching (50%), light stretching (25%), very light stretching (10-15%), and application without stretching. The tapes, which maintain their elastic properties for 3-7 days, consist of polymer elastic fibers wrapped in 100% cotton fibers. The adhesive consists of wavy acrylic similar to fingerprints, latex-free, and heat is activated by it. The strips used for kinesiological taping are I, Y, X, mesh, or ring-shaped. The choice of tape type depends on the technique, and the stage of the disease, the affected may vary according to the region. I and Y strips are the most commonly preferred application methods to reduce pain [23]

I and Y strips will be used for the taping process to be applied to the back of the neck area (Figure 1).

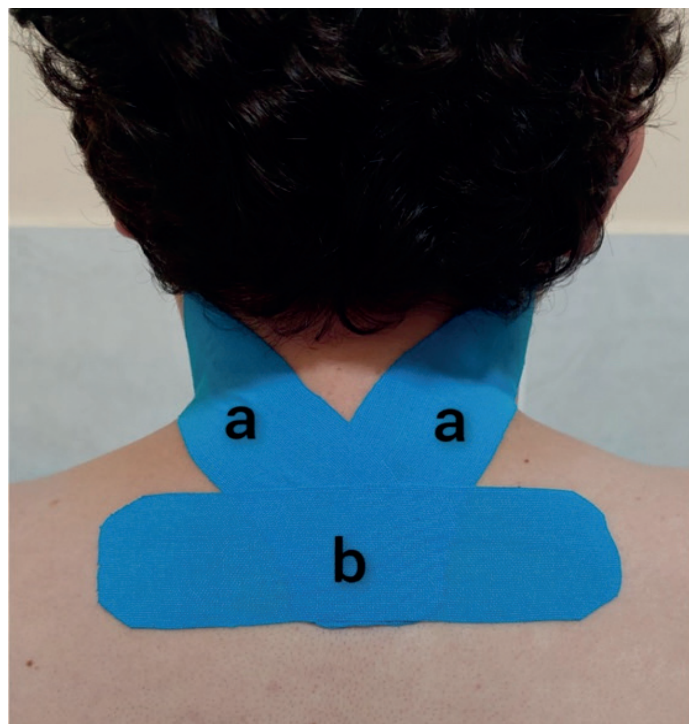


Figure 1. Kinesio Taping is an application. Application of the "Y" and "I" Band (a) "Y" bant and (b) "I" bant

Application of the "Y" Band

For the taping process, the bands were cut according to the length of the neck area of the people. Round shapes were given to all corners of the tape used in this process. The purpose of this is to prevent the tape from lifting from the edges during putting on and taking off the clothes and during the movements of the person. The tape was glued to the lower end of the cervical 7th vertebra (Vertebra Prominens) with submaximal tension, and the right end of the other two ends was glued to the temporal bone the left end was applied to the proc. mastoideus of right and the left end to the proc. mastoideus of the left temporal bone. No stretching was performed at the beginning and end of the band to avoid skin discomfort [23].

Application of the "I" Band

For the taping process, the bands were cut according to the length of the neck area of the people. Round shapes were given to all corners of the tape used in this process. The purpose of the tape is to prevent the tape from lifting from the edges during putting on and taking off the clothes and during the movements of the person. The tape was applied to the pars transversa of the trapezius muscle with moderate tension. No stretching was performed at the beginning and end of the band to avoid skin discomfort [23].

The applied patches stayed on the participants for 72 hours (3 days).

In addition, the Bournemouth Neck Pain Questionnaire was administered to the participants before and ten days after the taping procedure. The questionnaire included pain intensity, inadequacy in activities of daily living, inadequacy in social activities, anxiety, emotional aspects, kinesiophobia, and ability to control pain consisting of 7 questions. In addition to pain, the questionnaire assesses kinesiophobia, anxiety, depression, and the individual's ability to cope with pain specific to neck pain. The questions of the questionnaire are not about the current status of the individual, but the average severity of the symptoms present in the last week is questioned. Since it is known that the severity of symptoms related to neck pain varies over time, this questionnaire makes inquiries according to a certain time period. For this reason, the Bournemouth Neck Pain Questionnaire is designed to assess the clinical course of individuals and is quite successful in reflecting [24].

Statistical Analysis

The analysis of the data included in the study was performed with the SPSS (Statistical Program in Social Sciences) 25 program. Whether the data included in the study fit the normal distribution was checked with the Kolmogorov Smirnow Test [25]. The significance level (p) was taken as 0.05 for comparison tests. Since the variables were not normally distributed ($p > 0.05$), the analysis was continued with nonparametric test methods. Wilcoxon Sign test was used for dependent dyadic groups and

Mann Whitney U test was used for dependent dyadic groups. Mean, standard deviation, median, minimum, maximum, number and percentage were calculated for descriptive data.

Results

In the participants included in the study, Bournemouth Neck Pain Questionnaire scale scores before taping were higher than after taping. The decrease in Bournemouth Neck Pain Questionnaire scale scores after taping was statistically significant ($p=0.001<0.05$, Table 2). The change in Bournemouth Neck Pain Questionnaire before and after taping in individuals The change in the scores of the scale is given in Figure 2.

When the individuals were analyzed, it was observed that there were decreases in the scale scores after taping, and some individuals dropped as low as 0 points (Figure 2).

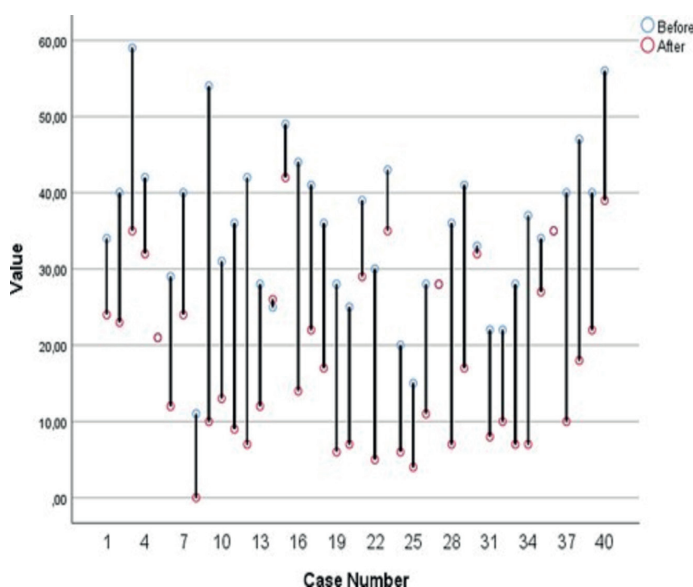


Figure 2. Before and After Taping Bournemouth Neck Pain Questionnaire Scale Scores Change

According to the Bournemouth Neck Pain Questionnaire, There was no statistically significant difference between the groups of gender, age, BMI, chronic disease variables in both pre-taping and post-taping scores ($p>0.05$, Table 3).

According to the Bournemouth Neck Pain Questionnaire There was no statistically significant difference in the Scale scores between regular and non-regular exercisers before taping ($p>0.05$, Table 3), but a statistically significant difference was found after taping ($p<0.05$, Table 3).

According to the Bournemouth Neck Pain Questionnaire Scale scores between smokers and non-smokers before taping significant difference was found ($p<0.05$, Table 3). but no statistically significant difference was found after taping ($p>0.05$, Table 3).

According to the Bournemouth Neck Pain Questionnaire The changes in the Scale scores before and after taping were statistically significant in women, men, 22-34 years old, 35 years old and over, normal weight and overweight, regular exercisers and non-exercisers, chronic disease and non-smokers, smokers and non-smokers ($p<0.05$, Table 3).

Table 1. Demographic information of participants

Variable	Group	Number	Percentage
Gender	Women	22	55.0
	Man	18	45.0
Age	22-34 years old	21	52.5
	35 years and older	19	47.5
BMI	Normal	26	65.0
	Overweight	14	35.0
Regular Sports	Yes	8	20.0
	No	32	80.0
Chronic Disease	Yes	6	15.0
	No	34	85.0
Smoking	Yes	23	57.5
	No	17	42.5

Table 2. Comparison of measurements before and after taping

Variable	Ort±ss	M (Min-Max)	Test	p Value
Before Taping	34.73±10.64	35.5 (11-59)	-5.282	0.001*
After Taping	17.83±11.21	15.5 (0-42)		

Ort; mean, ss; standard deviation, M; median, min; lowest score, max; highest score, test value; Wilcoxon Test Value, p value; statistical significance, * $p<0.05$; there is a statistically significant difference between the groups, Before-After Taping: A statistical analysis of the answers given to the questions before and after the neck survey we applied.

Limitations of the study

In the Kinesio taping, we applied in academicians, we explained the application of Kinesio tapping to academicians who did not know this application, and some academicians did not favor the taping application.

They also said that it would not be cosmetically pleasing when lecturing.

Other participants also stated that they removed the tape while taking a bath. All these factors make it difficult to ensure voluntary participation and collect sufficient data. These reasons constitute the limitations of our study.

Table 3. Intra and inter-group comparison for sociodemographic variables

Variable	Application	Before		After		Intragroup Comparison	
		Mean±ss	M (Min-Max)	Mean±ss	M (Min-Max)	Wilcoxon Test Value	p Value
Gender	Women	35.95±11.61	35(15-59)	19.68±12.38	17.5(4-42)	-3.981	0.001*
	Man	33.22±9.42	35.5(11-47)	15.56±9.43	15.5(0-35)	-3.518	0.001*
Between groups Comparison	Mann Whitney U	182.500		163.500			
	p Value	0.670		0.350			
Age	22-34 Years	34.48±11.93	36(11-59)	17.9±12.69	13(0-39)	-3.964	0.001*
	35 Years and Over Man	35±9.33	35(21-54)	17.74±9.65	17(7-42)	-3.519	0.001*
Between groups Comparison	Mann Whitney U	199.000		185.000			
	p Value	0.991		0.690			
BMI	Normal	34.54±11.63	34.5(11-59)	18.31±12.08	17(0-39)	-4.245	0.001*
	Overweight	35.07±8.91	36.5(22-49)	16.93±9.73	15.5(6-42)	-3.182	0.001*
Between groups Comparison	Mann Whitney U	171.500		179.500			
	p Value	0.770		0.940			
Regular Sport	Yes	33.5±10.04	33(21-54)	9.75±5.04	8(5-21)	-2.366	0.018*
	No	35.03±10.92	35.5(11-59)	19.84±11.46	20(0-42)	-4.753	0.001*
Between groups Comparison	Mann Whitney U	110.500		58.500			
	p Value	0.553		0.017*			
Chronic Disease	Yes	33.5±6.02	35(22-39)	18.17±11.44	16.5(7-32)	-2.207	0.027*
	No	34.94±11.31	35.5(11-59)	17.76±11.34	15.5(0-42)	-4.843	0.001*
Between groups Comparison	Mann Whitney U	91.000		98.000			
	p Value	0.676		0.879			
Cigarette	Yes	38.3 ± 10.44	40(20-59)	18.65 ± 11,7	17(6-42)	-4.077	0.001*
	No	29.88 ± 9.1	31(11-42)	16.71 ± 10.76	13(0-32)	-3.410	0.001*
Between groups Comparison	Mann Whitney U	110.000		179.000			
	p Value	0.019*		0.651			

Ort; mean, ss; standard deviation, M; median, min; lowest score, max; highest score, *p<0.05; there is a statistically significant difference between the groups.

Discussion

Neck pain is a problem especially seen in people who are frequently exposed to non-neutral positions, such as students and office workers. In this problem, the pressure applied to the neck muscles causes a protective spasm in the structures surrounding the neck. As a result, ischemia, extreme pain, and abnormal neck posture are observed [26]. In our study, we investigated the effectiveness of the treatment of neck problems with Kinesio Taping, which is common in academics who spend long periods in front of the computer. According to the Bournemouth neck questionnaire used in the evaluation of neck pain after treatment with KT in our study, we found a statistically significant difference between the pre-treatment and post-treatment values of the participants [27]. Thus, we determined that the pain decreased statistically significantly (p=0.001).

Studies have been conducted in many countries on the validity

and reliability of the Bournemouth neck questionnaire. According to Salaree et al. [28] reported that this questionnaire is suitable for clinical and research use in the Iranian population. Geri et al. (29) reported that the Italian version of this questionnaire is suitable for clinical and research use. In the literature on the validity and reliability of the Bournemouth neck questionnaire used in our study in the Turkish population, Yılmaz et. gets. [30] reported that Cronbach's alpha values were 0.877 and 0.907 before and after treatment, respectively, and were appropriate in clinical applications. Similarly, Agce et al. [31] reported that with Cronbach alpha values of 0.97 and 0.99, it is suitable for use in multidimensional, short, practical individuals with neck pain.

In the literature, KT application has a widespread use in the treatment of musculoskeletal diseases. According to Paoloni et al. and Greig et al. [32,33] stated that taping can support lumbar muscles, provide mechanical support for body muscles, and

increase body flexion by reducing pain and accelerating tissue healing. Lim and Tay [34] reported that elastic banding is an effective method for musculoskeletal system pain. According to Arpaci et al. [35] reported that KT method was effective in increasing proprioceptive recovery in women and in reducing pain during resistant wrist extension in men in patients with lateral epicondylitis.

Many studies in the literature have reported that KT method is effective in the treatment of neck, back, and shoulder pain. From these studies, it was stated that KT method is effective in patients with mechanical neck dysfunction due to cervical lordosis problems [36,37]. Lopez et al. It has been reported that KT application significantly reduces the level of pain in fibromyalgia patients and improves the comfort of the head, neck, and shoulders [38].

Similar to our study, in studies investigating the efficacy of the KT method in the treatment of neck pain, Erdoğanoglu and Bayraklı found that there was a statistically significant difference between before and 24 hours after elastic banding in pain assessment [39]. Gonzales-Iglesias et al. reported that especially the cervical region is injured in acute whiplash injuries and that the application of elastic banding has positive results in reducing cervical pain [40]. According to Alahmari et al. applied the same form of taping as our study and placebo taping without creating tension. As a result, they reported that the pain in the VAS-taping group decreased significantly compared to the placebo group on the 3rd and 7th days [41]. Augustsson et al. reported that short-term balanced body taping treatment had a limited, reducing effect on pain sensitivity in the neck, back, and shoulders without being compared with other treatments [42].

In the comparison of KT method used in neck pain in the literature with other treatments, Elabd et al. [26] applied the same taping method as our study in the taping group in patients with neck pain and compared it with the posture exercise group and reported that KT was more effective than postural exercises in reducing neck pain. Taylor et al. [43] reported that taping had a short-term effect on neck and upper extremity pain and that this method could be a useful alternative to other conservative methods. Saavedra-Hernandez et al. [37] reported that there was no statistically significant difference between elastic banding and other methods, and that the elastic banding method was equally effective with other existing methods in neck pain. In our study, we concluded that the KT method was effective, similar to these studies in the literature.

There are resources describing the mechanism of action of KT therapy related to physiological and neuroanatomical approaches. Regarding these mechanisms, Erdoğanoglu and Bayraklı [39] reported that providing afferent sensory input with elastic banding provides relief in pain by activating the pain inhibitor mechanism. Regarding this mechanism, several studies have stated that the cutaneous tension stimulation provided by

KT inhibits the transmission of mechanical and painful stimuli. They reported that this is due to the fact that the KT method can provide inhibition by afferent impulses according to the gate control theory. In addition, it is reported that KT application can increase lymphatic and vascular flow and increase functional abilities in patients by helping to correct possible joint alignment disorders [33, 44,45]. Gusella et al. [46] reported that KT application normalizes muscle function with two main mechanisms. The first and mechanical one of these mechanisms is that taping affects the muscle fibers. This effect occurs by shifting the length-tension curve of the muscles and changing the position of the joints. The second mechanism speculates that the amplification of proprioceptive and kinesthetic information occurs because the taping stimulates skin stimulation and affects the central nervous system.

Conclusion

In our study, It has been concluded that KT is an effective method in the treatment of neck pain in academics who spend a long time at the computer and desk. It may shed light on the literature and researchers that our study can be an alternative treatment for people with pain complaints and who use computers a lot.

Conflict of interests

The authors declare that there is no conflict of interest in the study.

Financial Disclosure

The authors declare that they have received no financial support for the study.

Ethical approval

Our study was conducted among 24-55-year-old academicians (18 male and 22 female) volunteers who filled out an informed consent form. Participants were recruited from Malatya Turgut Özal University Interventional Clinic Approval from the Research Ethics Committee 2022/42 was obtained.

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