

*Araştırma Sunumu / Research Article*

**DİZ OSTEOARTRİTİNDE KİNEZYOLOJİK BANTLAMAMANIN AĞRI VE  
FONKSİYONELLİK ÜZERİNE ETKİSİ: PİLOT ÇALIŞMA**

**The effect of kinesiologic taping on pain and functionality in knee  
osteoarthritis: Pilot Study**

**Şebnem AVCI**

Abant İzzet Baysal Üniversitesi, avciseb@hotmail.com

**Mustafa YİĞİLİTAŞ**

Yalova Üniversitesi, fztmy77@hotmail.com

**Mehmet ARSLAN**

Abant İzzet Baysal Üniversitesi, fztmehmetarslan@hotmail.com

**Kartal SELİCİ**

Bülent Ecevit Üniversitesi, kartalselici@hotmail.com

**Tamer ÇANKAYA**

Abant İzzet Baysal Üniversitesi, tamercankaya@hotmail.com

**Öz**

Ağrı ve fonksiyon kayıplarına yol açan diz osteoartriti tedavisinde kinezyolojik bantlama dikkat çekmeye başlamıştır. Kuadriseps femorisin fasilitasyonu stabilizasyon ve yükleri taşımada diz eklemine yardımcı olabileceğinden çalışmanın amacı, fasilitasyon tekniğiyle uygulanan kinezyolojik bantlamanın ağrı ve fonksiyon üzerine etkisini araştırmak olarak planlandı. Pilot çalışma olarak planlanan araştırmaya 50 yaş üzeri 25 kadın 3 grup şeklinde alındı. Demografik verilerin alınmasından sonra, ‘Western Ontario ve McMaster Üniversiteleri Osteoartrit İndeksi’ ve ‘Diz Yaralanmaları ve Osteoartrit Sonuç Skoru’ anketleri, görsel analog skala ve merdiven çıkma testleri tedavi öncesi ve sonrası uygulandı. Kuadriseps femorislere Y şeklinde bantlama 1., 5. ve 10. günlerde uygulandı. Tedavi sonrası elde edilen değerler 3 grupta da anlamlı gelişme gösterdi ( $p<0,05$ ). Gruplar arası karşılaştırmalarda ağrı için anlamlı farklılık kinezyolojik bantlama grubunda bulundu ( $p=0,035$ ). ‘Western Ontario ve McMaster Üniversiteleri Osteoartrit İndeksi’

sonuçlarında anlamlı farklar fizik tedavi ve kinezyolojik bantlama grubu ( $p=0,017$ ) ile kinezyolojik bantlama ( $p=0,002$ ) gruplarında bulundu. ‘Diz Yaralanmaları ve Osteoartrit Sonuç Skoru’ sonuçlarında anlamlı fark ise yine aynı gruplarda ( $p=0,006$ ), ( $p=0,033$ ) bulundu. Gruplar arası üstünlük bulunmadı. Merdiven çıkma testinde gruplar arasında fark bulunmadı ( $p=0,063$ ). Ağrıdaki en iyi azalmanın kinezyolojik bantlama grubunda olması bantın fasilitatör etkisinden veya tedavi için bekleme listesi etkisinden kurtulmuş olmanın motivasyonundan olabilir. Kinezyolojik bantlamanın diz osteoartritinde kesinlikle kullanılması gerektiğini söyleyebilmek için daha fazla katılımcıyla yapılan çalışmalara ihtiyaç vardır.

*Anahtar kelimeler: Diz osteoartriti, Ağrı, Fonksiyon, Kinezyolojik Bantlama, Bekleme Listesi Etkisi*

## Abstract

In the treatment of knee osteoarthritis, which leads to pain and functional loss, kinesio logic taping has begun to attract attention. Because the facilitation of quadriceps femoris may help stabilization and load on the knee joint, the aim of the study was to investigate the effect of kinesio logic taping on pain and function, which was performed with facilitation technique. Twenty five women over 50 years of age included into this pilot study as 3 groups. After obtaining demographic data, ‘Western Ontario and McMaster Universities Osteoarthritis Index’, ‘Knee Injury and Osteoarthritis Outcome Score’ questionnaires, visual analog scale and stair climbing tests were performed as pre-post treatment. Y-shape taping was applied on quadriceps femoris muscles at first, 5<sup>th</sup> and 10<sup>th</sup> days. The post treatment values significantly improved in three groups ( $p<0,05$ ). There was a significant decrease on pain in taping group in comparison to others ( $p=0.035$ ). Significant differences were found in ‘Western Ontario and McMaster Universities Osteoarthritis Index’ score in physical therapy-taping group ( $p=0,017$ ), and in taping group ( $p=0,002$ ). Significant differences were found in ‘Knee Injury and Osteoarthritis Outcome Score’ in the same groups ( $p=0,006$ ), ( $p=0,033$ ) respectively. There was no superiority. No difference was found in stair climbing test ( $p=0,063$ ). Best improvement found in kinesio logic taping group on pain might arise from the tape itself or being motivated by relief from the waiting list effect for treatment. Further studies with more participants is needed to say that kinesio logic taping should be exactly used in knee osteoarthritis.

*Keywords: Knee osteoarthritis, Pain, Function, Kinesio logic Taping, Waiting List Effect*

## 1. Introduction

Osteoarthritis is disease which is characterized by the thinning of the cartilage in terms of destruction, inflammation or age; and genetic factors play a role in the development of osteoarthritis. Osteoarthritis is a painful disease and it affects the quality of life of individuals; and it primarily affects the hip, knees and hands (White & Waterman, 2012, s. 92). According to the World Health Organization, 25% of the individuals over 65 years have disease-related pain and functional loss (Bodur, 2011, s. 8). In our country, the prevalence of osteoarthritis is 14,8% among people over 50 years of age (Uysal & Basaran, 2009, s. 1).

According to previous prevalence studies, the most common body region of osteoarthritis was determined as knee. The main treatment goals in osteoarthritis are the pain relief, and recovering functions and preventing disability (Uysal & Basaran, 2009, s. 1 and 3). For this purpose, various treatment options are present including losing weight, exercise programs, physical therapy agents, taping, bracing, walking aids, occupational therapy, pharmacologic therapy and surgical approaches, and especially training of the patient (Cutolo, Berenbaum, Hochberg, Punzi, & Reginster, 2015, s. 612; Gamble, Wyeth-Ayerst, Johnson, Searle, & Beecham, 2000, s. 1906 ). As quadriceps femoris muscle is a substantial muscle group for providing knee movement, maintaining stability and compensating knee load, it is concentrated on strengthening this muscle in the treatment of knee osteoarthritis (knee osteoarthritis) (Ahn, Kim, Bae, & Lee, 2015, s. 1), and since the disability of knee osteoarthritis depends on the strength of this muscle and pain, it is required to be strong (Hinman, Bennell, Crossley, & McConnell, 2003, s. 865).

In recent years, kinesiologic tapes have found an application area for sport injuries particularly, and as well as, for conditions requiring relief pain, reducing edema and muscle spasm, and it has been considered as an alternative treatment method for knee osteoarthritis (Fu et al., 2008, s. 198). However, there are various studies regarding the effect of this relatively new treatment approach (Cho, Kim, Kim, & Yoon, 2015, s. 193; Fu et al., 2008, s. 198; Janwantanakul & Gaogasigam, 2005, s. 13). Therefore, the aim of the present pilot study was to examine the effect of kinesiologic tapes on pain and function in knee osteoarthritis.

## **2. Materials and Method**

Patients who were admitted to Abant İzzet Baysal University, Physical Therapy and Rehabilitation Hospital with the complaint of knee pain, between the dates of January 2015 and May 2015 included into the study. Inclusion criteria were determined as being over 50 years of age, being diagnosed with primary knee osteoarthritis in accordance with the criteria of American College of Rheumatology by a physician, not having a neurological disease or a rheumatic disease -except osteoarthritis-, not having any condition causing walking disability, and also orthopedic and balance disorders, and being a voluntary women for participating the study. Individuals with allergic skin problems, poor mental capacity, psychological problems, male gender and also illiterate individuals were excluded from the study. Ethical permission was obtained from Clinical Researches Ethical Committee of Abant İzzet Baysal University with the number of 2014/95-184 and informed consents were signed by the participants.

Study sample was divided into three groups. Hospitalized individuals with knee osteoarthritis randomly divided into two groups. Randomization was set by a computer. In the first group, kinesiology tape was applied in addition to routine physical therapy program (Hot pack-15 minutes, TENS-15 minutes, ultrasound-6 minutes, spa treatment-20 minutes. Five days in a week for 15 sessions). This group was named as physical therapy and kinesiology tape (PTKT) (n=9). Second group, named after physical therapy (PT), consisted of 8 participants received routine physical therapy program mentioned above. Individuals of third group were selected randomly among the non-hospitalized and volunteer ones not receiving physical therapy but in waiting list for the date of hospitalization. Only kinesiology tape was applied to this group (KT) composed of 8 participants.

Socio-demographic characteristics of individuals were recorded in evaluation form. As evaluation methods, West Ontario and MacMaster Universities Osteoarthritis Index (WOMAC) and Knee Injury and Osteoarthritis Outcome Score (KOOS) questionnaires, Visual Analog Scale (VAS) for pain and stair climbing test (SCT) were performed. These evaluations were performed twice as pre-treatment and post-treatment.

WOMAC is a 5-point Likert-type scale and consists of questions investigating three dimensions; pain (20 points), stiffness (8 points) and physical function (68 points). Higher scores on the WOMAC is the indicator of worse or more symptoms (Collins, Misra, Felson, Crossley, & Roos, 2011, s. 220; Küçükdeveci, 2011, s. 40). The validity and reliability of the index in Turkish was performed by Tüzün et al. (Tüzün, Eker, Aytar, Daşkapan, & Bayramoğlu, 2005, s. 32).

KOOS is a questionnaire consisting of 42 questions. It is a 5-point Likert-type scale evaluating parameters involving pain (36 points), other symptoms (28 points), activities of daily life (68 points), function in sport and recreation (20 points) and knee related quality of life (16 points). Scores obtained from each sub-group are transformed a score between 0 and 100; 0 indicates extreme knee problem and 100 indicates no symptoms. Its validity and reliability in Turkish was performed by Paker et al. (Collins et al., 2011, s. 213; Paker N, Buğdaycı D, Sabırlı F, Özel S, & Ersoy S, 2007, s. 353).

In the pain evaluation by using VAS, the individual is asked to mark his/her pain level on the 10 cm line between two endpoints; 0 and 10 indicates no pain and extreme pain respectively (Sheane et al., 2008, s. 1030).

Stair climbing test gives an information about lower extremities' strength and balance. In SCT, 9 steps of a standard stair are ascended and descended as fast and safe as possible, and meantime, the total time to ascend and descend steps is recorded with a chronometer. The test is initiated when both feet are on the ground and it is completed likewise. Walking aids or holding the handrail are reported, if present. If individual takes a rest, chronometer continues to run (Kennedy, Stratford, Wessel, Gollish, & Penney, 2005, s. 3).

**KT Procedure:** Following the pre-treatment assessments, individuals in PTKT and KT groups were taped by a physical therapist who had participated to a course regarding the application kinesiology tape, Level 1 and Level 2. Taping was performed while they were lying in the supine position, and their hips and knees are flexed to 30 and 60 degrees, respectively. The skin was purified from cream or etc. before taping. "Y" shape was applied from origin to insertion of quadriceps femoris

muscles bilaterally by facilitation technique. It was continued until superior surface of the patella and along with the rectus femoris at moderate tension (50-75%). Tape was divided into two tails on the superior surface of the patella, and the tails were combined on the patellar tendon by supporting the bone (Kase K, Wallis J, & T., 2003, s. 25) (Picture 1 illustrates the application on one side). Tapes were remained attached for five days on both quadriceps muscles once applied. Individuals were trained about cutting the rising edges of the tape and informing the physiotherapist to repeat the procedure in case of its separation from the skin. Taping was applied at the first day, and repeated fifth and tenth days; the evaluations were performed at the first and fifteenth days.

Patients were familiar with physical therapy applications but all patients who received kinesiological tape were not aware of the taping application. That was their first time of getting this new treatment approach. Patients in PTKT and PT groups had received 15 sessions of physical therapy at the physiotherapy unit of the hospital. In this unit, physical therapy procedure including hot pack, TENS, ultrasound and spa treatment was routinely applied by another physiotherapist.

**Statistical Analysis:** Descriptive data of the findings were calculated as median[Q1 Q3] and frequency. Shapiro Wilk test was used to determine whether the numerical characteristics were normally distributed or not within each group. Wilcoxon test was used for intragroup comparison and Kruskal Wallis test was performed for intergroup comparison before and after the treatment. Post-hoc Dunn test was used to determine which group or groups differ from the others. The level of statistical significance was accepted as  $<0.05$ . SPSS 20 Demo package was used for the analysis of data.

### 3. Results

A total of 46 participants were reached for the study. Twenty-one patients were excluded from the study; 9 were males, 1 had allergic skin type, 2 had previous orthopedic problem, 1 had poor mental capacity, 1 did not accept to participate due to psychological problems, 2 were illiterate and thus they did not understand the

questionnaires, 1 had vertigo, 2 had neurological disease and 2 had rheumatoid arthritis. Socio-demographic data of 25 women were summarized in Table 1. When pre-and post-treatment results of each three groups were compared, significant improvements were determined in WOMAC and KOOS questionnaires, VAS pain assessment and stair climbing test in all groups (Table 2). When investigating the differences between the groups, a statistical difference was found in favor of PTKT ( $p=0.017$ ) and KT groups ( $p=0.002$ ) in WOMAC index; however, the results of both groups was not superior to each other. There was a statistical significant decrease in VAS pain scales in KT groups in comparison to other groups ( $p=0.035$ ). According to the results of KOOS questionnaire, a statistical regression was detected in PTKT ( $p=0.006$ ) and KT groups ( $p=0.033$ ); however, the result of both groups was not superior to each other. The pre and post treatment differences of SCT did not reveal a significance among groups (Table 3).

#### 4. Discussion

The hypothesis stating that the kinesiological tapes applied for the facilitation of quadriceps muscle will have a positive effect on pain and functionality has been tested with this study. It was found that kinesiological tapes had positive effects on the results of WOMAC and KOOS scores, VAS and SCT. However, the greater effect of KT was found on pain.

In the treatment of knee osteoarthritis that causes severe conditions such as pain and function loss in advance ages, kinesiological tapes have appeared among the non-pharmaceutical and non-surgical operations in addition to the physical therapy and exercises. The therapeutic effect of kinesiological tapes is considered as the relationship between the stimulation of cutaneous afferents and firing motor unit; however, the exact mechanism is still unknown (Cai, Au, An, & Cheung, 2016, s. 109).

In a meta-analysis study of 19 articles evaluating the data of 530 individuals totally, it was expressed that KT did not have a significant effect on muscle strength (Csapo & Alegre, 2015, s. 455). Likewise, KT did not increase the muscle performance in a

study performed on 30 young and healthy individuals (Poon et al., 2015, s. 133) and 14 athletes (Fu et al., 2008, s. 200). Therefore, the evaluation of muscle strength was not included into the study.

There are studies indicating that direct application of kinesiology tapes stimulates cutaneous mechanoreceptors and relief the pain through gate-control theory, and the elastic nature of the tapes relaxes interstitial space and increase the flow of lymph fluid and blood circulation, and so the pain is relieved (Poon et al., 2015, s. 130). VAS was used for the evaluation of pain, and it was found that pain scores were significantly decreased in each three groups; however, intergroup comparisons showed that the difference was in favor of KT group compared to other groups. Since the participants had idea about physical therapy methods previously and they might get excited about kinesiology tapes when they saw it for the first time and they might feel more pain relief by means of the this new application. On the other hand, pain relief might be caused by placebo effect of the taping. In a systematic review authors reported that being in a waiting list for treatment affects quality of life and well-being of patients with chronic pain. This is called ‘waiting list effect’ and especially long durations (more than 6 months) is not acceptable for health care system (Lynch et al., 2008, s.108). In our kinesiology taping group, the individuals were selected from a waiting list of physical therapy. In that way, they started a treatment instead of waiting for it. A better reduction of pain in this group may be due to the removal of the waiting list effect.

Functional status is very important indicator in the treatment of knee osteoarthritis. WOMAC and KOOS are the most common functional disability scores. According to current results, the improvement in the scores of both questionnaires was in favor of groups PTKT and KT groups; however, the results of both groups were not advantageous to each other. In a study comparing kinesiology tape, ultrasound and TENS in patients with knee osteoarthritis, these non-pharmacologic therapies had positive effect on pain and functionality; however, they were not superior to each other (Mascarin et al., 2012, s. 5). In similar, a study investigating the efficacy of spa treatment in rheumatic diseases according to the results of 19 researches stated that patients with knee osteoarthritis might benefit from spa treatment (Françon &



Forestier, 2009, s. 1356). The results of current study comply with the findings of Mascarin et al. and Françon and Forestier. In our study, we found both physical therapy and kinesiologic taping have the similar beneficiary effects. So it is hard to say that only taping will be enough in the treatment of knee osteoarthritis.

In contrast with our study, Wageck et al. stated that 4-day kinesiologic tape application had no positive effect on pain and physical function in patients with osteoarthritis (Wageck, Nunes, Bohlen, Santos, & de Noronha, 2016, s. 157). We applied kinesiologic tape consecutively three times for totally 15 days. The reason of pain relief and functional well-being might arise from the long duration of the application.

In a study comparing kinesiologic tape and placebo in patients with knee osteoarthritis, the positive effects of kinesiologic tape on short-term and long-term (a month later) pain and functionality were reported (Mutlu, Mustafaoglu, Birinci, & Ozdincler, 2017, s. 28). The results of our study showed parallelism with the study of Mutlu et al.; however, the lack of long term investigation results of the application might be the limitation of our study. Besides, not controlling the drug usages of the hospitalized individuals as required, and thus, not controlling whether the pain was discontinued in association with the drug usage was the other limitation. The lack of investigating the mid-term evaluations and post-treatment long-term effects, and as well as not performing ROM measurement, a significant marker in knee osteoarthritis might be counted as other limitations.

## **5. Conclusion**

Kinesiologic tapes that might be counted among non-pharmacological methods for knee osteoarthritis as a comfortable and easy to apply method. It has positive effects on pain and functionality; but those improvements were also found in physical therapy group. So we are not definitely sure of the improvements depend on KT only. However, further studies with more participants are required to support tape usage in routine practices.

**Conflict of interest**

Authors declare no conflict of interest.

This study was presented as verbal abstract in 1.st International Health Sciences Congress in Trakya University, Edirne/Turkey November 23-25 2017

**References**

- Ahn, I. K., Kim, Y. L., Bae, Y.-H., & Lee, S. M. (2015). Immediate effects of kinesio logic taping of quadriceps on motor performance after muscle fatigued induction. *Evid Based Complement Alternat Med.*, 2015(410526), 1-7.
- Bodur, H. (2011). Dünyada ve Türkiye’de osteoartrite güncel bakış; epidemiyoloji ve sosyoekonomik boyut. *Türk Geriatri Derg.*, Özel sayı(1), 7-14.
- Cai, C., Au, I., An, W., & Cheung, R. (2016). Facilitatory and inhibitory effects of Kinesio tape: Fact or fad? *J Sci Med Sport.*, 19(2), 109-112.
- Cho, H.-y., Kim, E.-H., Kim, J., & Yoon, Y. W. (2015). Kinesio taping improves pain, range of motion, and proprioception in older patients with knee osteoarthritis: a randomized controlled trial. *Am J Phys Med Rehabil*, 94(3), 192-200.
- Collins, N. J., Misra, D., Felson, D. T., Crossley, K. M., & Roos, E. M. (2011). Measures of knee function: International Knee Documentation Committee (IKDC) Subjective Knee Evaluation Form, Knee Injury and Osteoarthritis Outcome Score (KOOS), Knee Injury and Osteoarthritis Outcome Score Physical Function Short Form (KOOS-PS), Knee Outcome Survey Activities of Daily Living Scale (KOS-ADL), Lysholm Knee Scoring Scale, Oxford Knee Score (OKS), Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), Activity Rating Scale (ARS), and Tegner Activity Score (TAS). *Arthritis Care Res.*, 63, 208-228.
- Csapo, R., & Alegre, L. M. (2015). Effects of Kinesio® taping on skeletal muscle strength—A meta-analysis of current evidence. *J Sci Med Sport.*, 18(4), 450-456.

- Cutolo, M., Berenbaum, F., Hochberg, M., Punzi, L., & Reginster, J.-Y. (2015). Commentary on recent therapeutic guidelines for osteoarthritis. *Seminars in arthritis and rheumatism*, 44(6), 611-617.
- Françon, A., & Forestier, R. (2009). Spa therapy in rheumatology. Indications based on the clinical guidelines of the French National Authority for health and the European League Against Rheumatism, and the results of 19 randomized clinical trials. *Bull Acad Natl Med.*, 193(6), 1345-1356.
- Fu, T.-C., Wong, A. M., Pei, Y.-C., Wu, K. P., Chou, S.-W., & Lin, Y.-C. (2008). Effect of Kinesio taping on muscle strength in athletes-a pilot study. *J Sci Med Sport.*, 11(2), 198-201.
- Gamble, R., Wyeth-Ayerst, J., Johnson, E. L., Searle, W.-A., & Beecham, S. (2000). Recommendations for the medical management of osteoarthritis of the hip and knee. *Arthritis & Rheumatism*, 43(9), 1905-1915.
- Hinman, R., Bennell, K., Crossley, K., & McConnell, J. (2003). Immediate effects of adhesive tape on pain and disability in individuals with knee osteoarthritis. *Rheumatology*, 42(7), 865-869.
- Janwantanakul, P., & Gaogasigam, C. (2005). Vastus lateralis vastus medialis obliquus muscle activity during the application of inhibition and facilitation taping techniques. *Clin Rehabil.*, 19(1), 12-19.
- Kase K, Wallis J, & T., K. (2003). *Clinicaltherapeutic applications ofthe Kinesio Taping method* ( 2nd ed.). Tokyo: Kinesio Taping Association.
- Kennedy, D. M., Stratford, P. W., Wessel, J., Gollish, J. D., & Penney, D. (2005). Assessing stability and change of four performance measures: a longitudinal study evaluating outcome following total hip and knee arthroplasty. *BMC musculoskeletal disorders*, 6(3), 1-12.
- Küçükdeveci, A. A. (2011). Osteoartiritte İşlevsel Değerlendirme Ölçütleri. *Turk Geriatri Derg.*, Özel sayı (1), 37-44.
- Lynch, M.E., Campbell, F., Clark, A.J., Dunbar, M.J., Goldstein D., Peng, P., Stinson, J., Tupper, H. (2008). A Systematic Review of the effect of waiting for treatment for chronic pain. *Pain*, 136, 97-116.
- Mascarin, N. C., Vancini, R. L., dos Santos Andrade, M., de Paiva Magalhães, E., de Lira, C. A. B., & Coimbra, I. B. (2012). Effects of kinesiotherapy, ultrasound

- and electrotherapy in management of bilateral knee osteoarthritis: prospective clinical trial. *BMC Musculoskelet Disord.*, 13(1), 182.
- Mutlu, E. K., Mustafaoglu, R., Birinci, T., & Ozdincler, A. R. (2017). Does Kinesio Taping of the Knee Improve Pain and Functionality in Patients with Knee Osteoarthritis?: A Randomized Controlled Clinical Trial. *Am J Phys Med Rehabil.*, 96(1), 25-33.
- Paker N, Buğdaycı D, Sabırlı F, Özel S, & Ersoy S. (2007). Knee Injury and Osteoarthritis Outcome Score: reliability and validation of the Turkish version. *Türkiye Klinikleri J Med Sci.*, 27, 350-356.
- Poon, K., Li, S., Roper, M., Wong, M., Wong, O., & Cheung, R. (2015). Kinesiologic tape does not facilitate muscle performance: A deceptive controlled trial. *Man Ther.*, 20(1), 130-133.
- Sheane, B. J., Doyle, F., Doyle, C., O'Loughlin, C., Howard, D., & Cunnane, G. (2008). Sub-optimal pain control in patients with rheumatic disease. *Clin Rheumatol.*, 27(8), 1029-1033.
- Tüzün, E., Eker, L., Aytar, A., Daşkapan, A., & Bayramoğlu, M. (2005). Acceptability, reliability, validity and responsiveness of the Turkish version of WOMAC osteoarthritis index. *Osteoarthritis Cartilage.*, 13(1), 28-33.
- Uysal, F. G., & Basaran, S. (2009). Knee osteoarthritis/diz osteoartriti. *Türk Fiz Tıp Rehab Derg.*, Özel Sayı(1), 1-7.
- Wageck, B., Nunes, G. S., Bohlen, N. B., Santos, G. M., & de Noronha, M. (2016). Kinesio Taping does not improve the symptoms or function of older people with knee osteoarthritis: a randomised trial. *J Physiother.*, 62(3), 153-158.
- White, P. H., & Waterman, M. (2012). Making osteoarthritis a public health priority: Several initiatives are placing this chronic illness on the national agenda. *Orthopaedic Nursing*, 31(2), 92-97.

**Table 1. Socio-demographic data**

	PTKT (n=9)		PT (n=8)		KT (n=8)	
	Frequency	%	Frequency	%	Frequency	%
<b>Age (year)</b>	58,00±7,890		62,50±11,097		54,88±7,680	
<b>Occupation</b>						
<b>Housewife</b>	9	100	6	75	5	62,5
<b>Retired</b>			1	12,5	1	12,5
<b>Still working</b>			1	12,5	2	25

Descriptive analysis.

**Table 2. Comparisons pre and post treatment**

	PTKT (n=9)			PT (n=8)			KT (n=8)		
	Pre	Post	p	Pre	Post	p	Pre	Post	p
	Median[Q1-Q3]	Median[Q1-Q3]		Median[Q1-Q3]	Median[Q1-Q3]		Median[Q1-Q3]	Median[Q1-Q3]	
<b>WOMAC</b>	24[19-26,50]	15[11,50-20,50]	0,011 *	23,50[20-30]	22,50[17,75-27,25]	0,015 *	28[23,25-3]	18[15,50-24]	0,011 *
<b>VAS</b>	2,80[1,75-5,50]	2[1,25-2,95]	0,013 *	3,85[2,67-5]	3,45[2,15-4,52]	0,012 *	4[3,5-5,65]	2,60[1,70-2,92]	0,012 *
<b>KOOS</b>	52[41,50-68]	34[30-53,50]	0,013 *	51,50[41-71,50]	47[37-65,75]	0,011 *	65[45-68,50]	49[36-61]	0,012 *
<b>SCT</b>	105,5[98,5-12,25]	96[93-105,10]	0,008 *	115,75[102,5-124]	112,85[100,32-119,25]	0,011 *	101,50[97,50-127]	99,50[87,75-114]	0,017 *

Wilcoxon test

\* p<0,005

WOMAC: West Ontario and MacMaster Universities Osteoarthritis Index

VAS: Visual Analog Scale

KOOS: Knee Injury and Osteoarthritis Outcome Score

SCT: Stair Climbing Test

**Table 3. Comparisons of differences among groups**

	<b>PTKT (n=9)</b>	<b>PT (n=8)</b>	<b>KT (n=8)</b>	P	Comparison between groups	p
	Median [Q1- Q3]	Median [Q1- Q3]	Median [Q1- Q3]			
Difference WOMAC	6 [10,50-4,50]	2,50 [3-2]	7 [10-6,25]	0,002*	PT-KT PTKT-PT PTKT-KT	0,002* 0,017* 1,00
Difference VAS	0,8 [2,95-0,4]	0,45 [0,57-0,22]	1,3 [3,1-0,8]	0,033*	PT-KT PTKT-PT PTKT-KT	0,035* 0,179 1,00
Difference KOOS	16 [18,5-7]	4 [5,5-2,25]	10,5 [15-6,5]	0,005*	PT-KT PTKT-PT PTKT-KT	0,033* 0,006* 1,00
Difference SCT	4 [8-2,4]	2,35 [4,7-2]	7,8 [12,75-4,5]	0,063		

Kruskal Wallis test  
Post-hoc Dunn test  
\*p<0,005

WOMAC: West Ontario and MacMaster Universities Osteoarthritis Index  
VAS: Visual Analog Scale  
KOOS: Knee Injury and Osteoarthritis Outcome Score  
SCT: Stair Climbing Test  
PT: Physical Therapy  
KT: Kinesiological taping  
PTKT: Physical Therapy+ Kinesiological taping



**Picture 1. Y-shaped tape application**