Review

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COMPARISON OF EFFECTS OF KINESIO TAPING VERSUS MCCONNELL TAPING ON FUNCTION AND DYNAMIC POSTURAL CONTROL IN ATHLETES WITH PATELLOFEMORAL PAIN SYNDROME

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ABSTRACT: Patellofemoral pain syndrome is characterised through retro patellar (behind the kneecap) or peripatellar (around the kneecap) pain. It's frequently called as anterior knee pain. Patellofemoral pain syndrome risk factor include weakness in quadriceps muscle, increased hip abduction strength, alternation in biomechanics of lower limb, forces increased at foot during stair ascending and descending, squatting. The main objective of the study is to compare the effects of Kinesio taping versus McConnell taping on function and dynamic postural control in athletes with patellofemoral pain syndrome. It was a single blinded randomized controlled study. 60 patients were randomly enrolled in the study with an age ranging from 18-40 years with Patellofemoral Pain Syndrome. Data was collected from Spine Physiotherapy clinic, Sahiwal. In group A patients were treated with Kinesio taping while in Group B patient was treated with McConnell taping. And conventional therapy was given in both groups. Star excursion balance test and lower extremity functional test scale were used to assess functional and dynamic postural control. Reading were taken into record before treatment and after 24hrs of treatment. The outcomes revealed that there was statistically significant difference within the group. While comparison between 2 groups, group A shows more statistically significant result as compared to group B. P-value was < 0.001 for functional and dynamic postural control. This study concluded that KT and MT both were effective for treating the patient PFPS for functional and dynamic postural control, but Kinesio taping shows more significant result as compared to McConnell taping.

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INTRODUCTION

Most common problem in knee joint is Patellofemoral pain syndrome (PFPS). It's mostly effect in females. Patellofemoral pain syndrome mostly occurs in musculoskeletal structure around the knee join due to repetitive stress on it (1).

Patellofemoral pain syndrome is characterized through retro patellar (behind the kneecap) or peripatellar (around the kneecap) pain. It's frequently called as anterior knee pain (2). Patellofemoral pain syndrome having diffuse ache in knee joint at anterior aspect. It's mostly occurred during squats, ascending stair or descending it, or if prolonged sitting occurs. Due to abnormal alternation in lower extremity structure like augmented pronation on feet, rotation of tibial, deteriorated hip rotation and femoral anteversion place excessive stress in the patients of PFPS. Iliotibial band tightness and vastus medialis oblique muscle weakness also lead to place stress in patellofemoral joint. Imbalance in vastus lateralis and VMO muscle caused lateral deviation of patella during knee extension. There is multiple factor associated with structure of knee which become a source of patellofemoral pain syndrome (3).

Annual and true prevalence of PFPS is not known but it is estimated that there is 40% incidence of patellofemoral pain syndrome in patients. PFPS occurrence mostly range from active child age to sedentary elderly individual, in the age between 12-17. These individual mostly complaint about anterior knee pain. And mostly PFPS occur in sports

individual or athletes. Some studies conclude that about 15-40% sports individual/ athletes suffer from PFPS (4). Patellofemoral pain syndrome risk factor include weakness in quadriceps muscle, increased hip abduction strength, alternation in biomechanics of lower limb, forces increased at foot during stair ascending and descending, squatting (5). Patellofemoral pain syndrome sign and symptoms include pain during activity, cracking or popping sound, limited range of motion, static and dynamic stability variation or alteration, alteration in Q-angle (6). Primary management for patellofemoral pain syndrome includes rest, icing, NSAIDs and taping and bracing, exercise therapy, ultrasound, steroidal injection to provide stability to knee joint. And secondary management include Surgery (7).

Kinesio tapping is a therapeutic elastic tape which is an alternative technique for taping that is used for managing a multiple clinical condition or pathologies like shoulder impingement syndrome, patellofemoral pain syndrome, Achilles tendinopathy and to prevent sports injuries (8). Taping is usually applied to decrease the intensity of pain, increase the range of motion, decrease inflammation, to facilitate or inhibit a muscle, to improve the pattern of gait, to facilitate the mechanical support and also increase or improve the functional activity or ADLs of individual or patients (9). Some Previous investigation revealed that Kinesio taping also show immediate effect for managing the patient for pain, muscle strengthen, knee proprioception, range of motion (10). McConnell taping is helpful for relieving pain immediately although in functional activity like stair climbing, squatting etc. For example, if a patient's quadriceps inhibit its function due to pain, if it is treated properly and pain intensity reduce than quadriceps again start to work its function properly like pain free stair climbing or squatting. So, it conclude that taping with exercise seems effective for strengthening of quadriceps (11). So, the primary intention of the literature is to explore the consequences of Kinesio taping technique and McConnell taping for functional assessment, dynamic balance and postural control. Kinesio and McConnell taping techniques have multiple standards and methods implemented to manage PFPS. There are empirical evidences on influences of tape application in development of dynamic postural control and function in athletics with PFPS. In our study, we will evaluate the comparative effects of two different athletic taping techniques i.e. McConnell taping and the Kinesio taping on athletes suffering through PFPS.

METHODOLOGY

It was randomized control trial study, single blinded; Non-Probability Purposive sampling method technique was used in this study. All athlete individual who came to Spine Physiotherapy clinic, Sahiwal was consider and evaluate for patellofemoral pain syndrome. For this purpose, notices were placed in the sports centers of different schools' colleges and universities. Also, various sports club and organizations such as Gymkhana Club, Sahiwal, German Fitness and Sports, Sahiwal, and Sahiwal Club was contacted for the screening for potential candidate. Duration of the study was 9 months. Sample size consist of 60 patients, 5% level of significance, 90% power of test, where σ^2= variance 1.21, Z1-α= confidence level 95%=1.96, Z1-β= power of test 90%, μo= Population mean 1(Kinesio), μα= population mean 2 (McConnell), using the formula

$$n=2\sigma^2 (Z1-\alpha+Z1-\beta)^2/(\mu o-\mu\alpha)^2$$

Thirty patients from each of two groups made up of 60 athletes were randomly assigned. Kinesio taping was used on the patients in Group A, whereas McConnell

taping was used on the patients in Group B. Patients were divided into groups randomly using a random number table created by a computer. The inclusion standards comprise Acute patellofemoral pain syndrome in athletes who have been referred, symptoms lasting at least three months, subject who has never had tape applied to him or her, positive Clark's test Age range: 18 to 40, all sexes (12). Patients were excluded if they had arthritis, any other knee abnormalities, or ankle and hip pathology. fracture of the lower limb a person using corticosteroids, Pregnancy, Taping-related irritation, Surgery were a part of the exclusionary standards. Written about their willingness to participate in the study, informed permission was taken into consideration. Volunteers received comprehensive information about the research protocol, both verbally and in writing. Both groups get traditional treatment, which includes quadriceps exercises, TENS, and ultrasound13. Assessments were performed both before and after the tape was applied. To establish a baseline, three measurements were taken: a pre-tape evaluation taken right before the application of tape, a post-taping assessment taken 24 hours later while the tape was still in place, and a follow-up measurement taken 24 hours later after the tape was removed. Pre-tape evaluation served as a baseline measurement. Actual dynamic postural control was measured using the Excursion Balance Test (SEBT). LEFS was employed to gauge functional activity. The anterior, posteromedial, and posterolateral directions were used to measure the SEBT. K-taping/ M-taping during 24 hours, ultrasound at 1 MHZ, 0.8 W/cm2, TENS at 100 Hz, 50 s pulse, 50% variation frequency, 20 minutes, and quadriceps exercise at 10 repetitions were the dosage and duration. 13. Data management and analysis were performed using SPSS software version 23. P-values lower than 0.05 were deemed significant. Frequency tables, pie charts, and bar charts were used to depict a summary of group measures that were measured over time. Wilcoxon test and MANN WHITNEY 'U' test It was used to demonstrate how subjective and objective measurements changed over time within and between groups.

RESULTS

Group A (Kinesio) mean and deviation of age was 35.10±3.84 and in Group B (McConnell) mean and standard deviation was 34.11±3.70.

Table 1.1 shows that $p<0.001$ which illustrate that Kinesio taping show more statistical difference as compared to McConnell taping when managing the patient PFPS for dynamic postural control.

Figure 1.1 shows that $p<0.001$ which illustrate that Kinesio taping show more statistical difference as compared to McConnell taping when managing the patient PFPS for functional control.

DISCUSSION

The study's main goal is to find out how Kinesio taping and McConnell taping affect functional evaluation, dynamic balance, and postural control. While used to treat PFPS, kinesio taping and McConnell taping have distinct standards and methods. Additionally, there are actual data showing how the use of tape throughout development might affect function and dynamic postural control in athletes with patellofemoral pain syndrome.

Yong-Kyu Choi and his associate carried out a study. The study used a randomized control trial design. The purpose of this study was to investigate the results of PNF-pattern-following Kinesio and McConnell method in stroke patients in order to assess the impact of walking speed and balance in these patients. A total of 36 hemiplegic patients made up the sample, and they were randomly divided into three groups: a control group and two experimental groups.

Group 1 deal with Kinesio taping method and Group 2 given McConnell taping technique, and Group 3 was control group. Each group were having 12 patients. 10-minute walk test(10MET) and Berg balance scale (BBS) was used as a parametric tool. To evaluate balance and their ability Berg balance scale was used, and for assessing walking speed 10-minute walk test was used. Duration of the session was consisting of 8 weeks. Result shows that group 1 revealed more statistically significant result when associated to group 2 and also with group 3 for balance improvement and walking speed. They conclude in their study that Kinesio taping was more effective in patient of stroke for gaining walking speed and balance as compared to McConnell taping(14).

Result of our study was supported by above mention literature. In Group A (Kinesio taping) mean difference of SEBT (ant) was 30.51±1.70, SEBT (post. Medial) was 28.93±0.56, SEBT (post. Lateral) was 28.14±0.22 and LEFT was 24.8±1.48. While in Group B (McConnell taping) mean difference of SEBT (ant) was 16.68±3.54, SEBT (post. Medial) was 15.93±0.54, SEBT (post. Lateral) was 15.72±0.89 and LEFT was 12.96±1.34, with p-value was <0.001 which revealed that both techniques were effective for managing functional and dynamic postural control in PFPs patients but Kinesio taping was clinically and statistically more effective and show more significant result as compared to McConnell taping.

Another study supports our study result. Mihir N. Mange et.al, worked on a patient of PF knee OA. Design of their study was randomized control trail. Aim of their work was to relate the instant results of Kinesio and McConnell taping in subject of knee OA at patellofemoral joint. Objectives of their work was to relate the efficacy of Kinesio and McConnell taping on Knee joint during flexion and extension ROM, pain was assessed through Numerical pain rating scale all through in Squatting and stairs descending in osteoarthritis patients at patellofemoral joint.

60 patients of knee OA in between the age of 45-55 year were randomly allocated into 2 groups. Group 1 patients were treated with Kinesio taping and patients in group 2 was treated with McConnell taping. And each group having 30 patients in each group. Goniometer and NPRS was used as an assessing tool for ROM and pain. Man, Whitney u test was used to analyze the data. And result revealed that Kinesio taping show significant difference for reducing pain($p<0.04$) and gain ROM($p<0.03$). and they conclude that Kinesio taping show more significant result statistically and clinically as compare to McConnel taping(15).

CONCLUSION

According to results, that analyze from statistical analysis and from available literature that these both taping techniques (Kinesio and McConnell) are effective in managing the patient of PFPS for functional and dynamic postural control but Kinesio taping is more effective as compared to McConnell taping.

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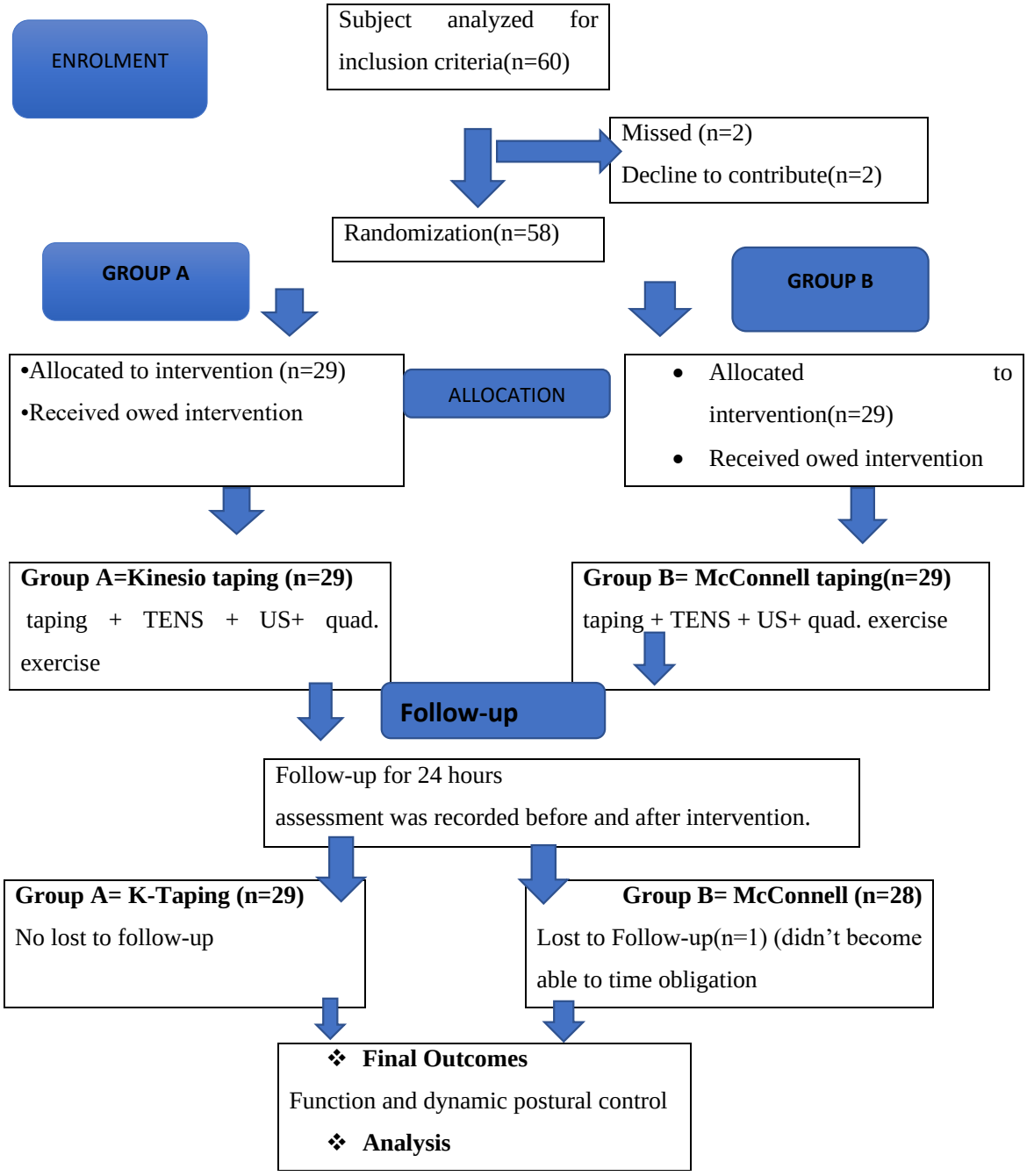


Table 1.1 SEBT between both groups

Man Whitney U Test of SEBT					
	treatment group	Mean	Standard Deviation	Mean Rank	P-Value
SEBT Ant pre	Kinesio (Group A)	57.28	4.30	29.07	0.94
	McConnell	56.82	6.23	28.93	
SEBR post	Kinesio	87.79	2.60	43.00	<0.001
	McConnell	73.50	2.69	14.50	
SEBT Med Pre	Kinesio	58.69	3.41	30.71	0.42
	McConnell	57.86	4.14	27.23	
SEBR Med post	Kinesio	87.62	2.85	43.00	<0.001
	McConnell	73.79	4.68	14.50	
SEBT Lat Pre	Kinesio	58.83	2.63	29.88	0.68
	McConnell	57.86	4.80	28.09	
SEBT Lat post	Kinesio	86.97	2.85	43.00	<0.001
	McConnell	73.61	3.91	14.50	

Figure 1.1 LEFT in both groups

