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Rehabilitation of knee injuries in Kabaddi players of Punjab

Fatehjeet Singh Maan

Abstract
The knee joint is the most complex joint of the body. The knee is formed by the femur (the thigh bone), the tibia (the shin bone), and the patella (the kneecap). Several muscles and ligaments control the motion of the knee and protect it from damage at the same time. Kabaddi is a very complex sport. Knee joint is very vulnerable joint to get injured in kabaddi.
Objective of the Study: The specific aim and objective of study is to investigate the effect of rehabilitation in Male kabaddi knee injuries.
Methods: Out of 60 subjects who will diagnosed by an Orthopaedician as having knee injuries in kabaddi and who showed a typical restriction of ROM and PAIN. 30 will be given rehabilitation (experimental GROUP A) and the other 30 will (control GROUP B). Analysis was based on the ROM and relief of pain.
Results: The subjects who were given Straping, Sports Massage, Stretching and Strengthening exercises showed reduction in pain and improve ROM.
Discussion and Conclusion: Experimental and Control groups are reducing knee pain with help of Rehabilitation but efficiency of Rehabilitation is greater in Experimental group than Control group.

Keywords: Kabaddi knee injuries, pain, disability, range of motion, physical therapy, rehabilitation, stretching, strengthening, Cry therapy, sports massage, strapping and taping

Introduction
Kabaddi is counted among the most common and widely played traditional sports in India. There is a popular belief that Kabaddi originated in the Indian state of Tamil Nadu. According to a legend, this game came into existence, when a boy hit another boy for his candy. The boy who was hit chased the boy who hit him, and hit him back and ran away. The feature of holding the breath while chasing, was added later when the game evolved. Kabaddi is the game, where one person play against seven people. Kabaddi is also known as the "Game of the Masses" and it has simple, easy to comprehend rules.
In India, Kabaddi is quite famous and popular in the state of Punjab. Kabaddi has become extremely popular in rural India as it is simple and inexpensive game, and does not require a massive playing area, or any expensive equipment.
Kabaddi is recognized as a National sport in India and Indian people love to play the game very much, as it does not need many kinds of equipments to play. Another reason is that, the game helps one to be physically fit and also teaches about how to defend and attack at the same time. There are various forms of Kabaddi available in India and they are played in different parts of the country.

Commom Kabaddi knee Injuries
Sprains
A sprain means you've stretched or Torn a ligament. Common knee sprains usually involve damage to the ACL and/or MCL. The most serious sprains involve complete tears of one or more of the knee ligaments. Symptoms of knee sprains include:

- A popping or snapping sound in the knee at the time of injury.
- Pain that seems to come from within the knee, especially with movement.
- Not being able to put any weight on that leg.

- Swelling.
- Fluid behind the kneecap.
- The knee feels loose or unstable or gives way.

Strains

A strain means you've partially or completely torn a muscle or tendon. With knee strains, you may feel symptoms similar to a sprain and may see bruises around the injured area.

For injuries like mild sprains, strains, and overuse, resting your knee may be one of the first treatments your doctor recommends. Remember RICE:

R- Rest I- Ice C- Compression E- Elevation

Material and Methods

Research Design: A quantitative research approach, Quasi experimental research in which non-equivalent control group design was used for the present study.

Setting: The present study was conducted at Out Patient Department of Adesh College of Physiotherapy, (Muktsar) and Sandhu trauma centre (Muktsar).

Sample: Subjects were selected on the basis of convenient sampling technique. A sample of 60 Male subjects (30 subjects for control group and 30 subjects for experimental group) with kabaddi knee injuries who volunteered to participate and fulfill the inclusion and exclusion criteria were included in the study. The variables of the study are:-

Dependent Variable: Degree of Knee Pain and Degree of Knee Injury

Independent Variable: Cryotherapy, Sports Massage, Strengthening and Strapping and Taping

Instrumentation: Treatment intervention used under study are

Cryotherapy: (Ice Packs, Cold Gel Packs, Ice Immersion),

Sports Massage: (Towels, Powder, Olive Oil),

Strengthening: (Small Pillow, Quadriceps Table, Resistive Exercise Band)

Stretching: (Straps, Buttress Material, Towels),

Strapping and Taping: (Tape, Bandage).

Data analysis was done by using descriptive and inferential statistics such as mean, percentage, standard deviation, unpaired t test and chi square test.

Results

The data was analyzed using statistical tests. Related t-test was used to compare the effect of rehabilitation of knee injuries in kabaddi by using each group of patients containing 30 subjects.

Table 1: Intra-Group comparison of Pain

Group	Application	N	Mean ± S.D	t – value
Control	Cryotherapy	30	3 ± 0.816	11.627
Experimental	Rehabilitation (intervention)	30	3.8 ± 0.788	15.26

S Significant $P<0.05$

Analysis between different conditions was done using paired t-test. Paired t-test revealed that there was significance difference in pain on VAS scale in Experimental and Control group in knee injuries. A significant difference was found at P<0.05 as shown in above table, the mean & standard deviation for Control & Experimental groups were 3 ± 0.816 & 3.8 ±0.788 respectively.

Mean and standard deviation were calculated for both the groups of the study, including age. Intergroup and intragroup comparison was made between active and passive ROM (flexion) on alternate days for 10th sitting. The scores were then charted in the master chart and subjected to statistical analysis.

Table 2: Descriptive Statistics of Active and Passive Flexion ROM in Control Group

Range of Motion	Observation	N	Mean	Std. Deviation
Active Flexion	Pre 1	30	99.7500	6.146
	Post 10	30	106.1000	5.7938
Passive Flexion	Pre 1	30	103.9000	6.0341
	Post 10	30	111.5500	6.8478

The above table shows the descriptive statistics of active flexion ROM in control Group before the treatment, on the base pre and after the treatment on post 10th sitting. The mean and S.D on base pre was 99.75 and ± 6.14, and that on post 10^{th} sitting was 106.1 and ± 5.79. The table also depicts that during passive flexion the mean ROM in control group on pre-intervention was 103.9 and ± 6.03, and on post-intervention 10^{th} sitting was 111.55 and ±6.84.

Table 3: Descriptive Statistics of Active Flexion ROM in Experiment Group

Range of Motion	Observation	N	Mean	Std. Deviation
Active Flexion	Pre 1	30	97.8500	8.1839
	Post 10	30	106.5500	8.0490
Passive Flexion	Pre 1	30	102.7500	8.6443
	Post 10	30	110.9000	8.6383

The above table shows the descriptive statistics of active flexion ROM in experimental Group before the treatment, on the base pre and after the treatment on post 10th sitting. The mean and S.D on base pre was 97.85 and ±8.18, and that on post 10th sitting was 106.55 and ±8.04. The table also depicts that during passive flexion the mean ROM in experimental group on pre-intervention was 102.75 and ± 8.64, and that on post 10th sitting was 110.9 and ±8.63.

Table 4: Intergroup Comparison of Active and Passive Flexion ROM

Group	Class	Observation	Mean	Std. Deviation	t-test
Control	Active	Pre-post10	-6.3500	1.8715	-15.174 (p=.001) **S**
	Passive	Pre-post10	-5.5000	2.4387	-10.086 (p=.001) **S**
Experiment	Active	Pre-post10	-8.9500	2.6848	-14.908 (p=.001) **S**
	Passive	Pre-post10	-7.3000	2.9218	-11.174 (p=.001) **S**

S Significant $P < 0.05$

The above table shows the intergroup comparison to find out the difference in active flexion ROM from pre to post 10th sitting, passive flexion ROM from pre to post 10th sitting in control group and experiment group using 't' test. In Control group, active flexion ROM from pre to post 10th sitting, showed a mean of 6.35 and a S.D of ± 1.88, 't'=15.17 (p =.001). Passive flexion ROM showed a mean of 5.5 and a S.D of ± 2.43, 't'=10.08 (p=.001) which showed very high significance in both active and passive ROM in control group. In experiment group active flexion ROM showed a mean of 8.95 and a S.D of ±2.69, 't'=14.9 (p=.001). Passive flexion ROM in experiment group showed a mean of 7.3 and a S.D of ±2.92, 't'= 11.18. (p=.001), which showed very high significance in both active and passive ROM in experiment group.

Table 5: Intra-group Comparison of Active and Passive Flexion ROM between the experimental and control group

Class	Observation	Group	N	Mean	Std. Deviation	t-test
Active	Pre-post10	Control	30	6.3500	1.8715	3.5530 (p=.001) S
		Experiment	30	7.8500	1.6840	
Passive	Pre-post10	Control	30	6.5500	1.4387	2.1150 (p=.041) S
		Experiment	30	8.5600	1.9210	

S Significant $P < 0.05$

The above table shows the intra group comparison of active flexion ROM and passive flexion ROM in both the groups from pre to post 10th sitting. Using paired 't' test Active flexion ROM in control group showed a mean of 6.35 and a S.D of ±1.88 and that in experiment group showed a mean of 7.85 and a S.D of ±1.68, 't'=3.55 (p=.001), which showed very high significance. Passive flexion ROM in control group showed a mean of 6.55 and a S.D of ±1.43 and that of experiment group showed a mean of 8.56 and a S.D of ±1.92, 't'= 2.11 (p=.041) which showed its significance. There is improvement in both active and passive flexion ROM in both the groups but experiment group is showing better improvement than control group.

Discussion

Analysis between different conditions was done which revealed that there was significance difference in pain reduction in experimental group as compare to control group in knee injuries. The result of this study suggest that though mean & standard deviation was greater in Experimental group (3.8 ± 0.788) as compared to Control (3 ± 0.816) but the t-test revealed more significant results when Rehabilitation is implicated on Experimental group ($P < 0.05$).

The intra group comparison of active flexion ROM and passive flexion ROM in both the groups from base pre to post 10th sitting were carried out using paired 't' test. Active flexion ROM in control group showed a mean of 6.35 and a S.D of ±1.88 and that in experiment group showed a mean of 7.85 and a S.D of ±1.68, 't'=3.55 (p=.001), which showed very high significance. Passive flexion ROM in control group showed a mean of 6.55 and a S.D of ±1.43 and that of experiment group showed a mean of 8.56 and a S.D of ±1.92, 't'= 2.11 (p=.041) which showed its significance. There is improvement in both active and passive abduction ROM in both the groups but experiment group is showing better improvement than control group.

From the result of this study it is seen that Rehabilitation are more beneficial in Experimental group than Control in case of knee injuries in kabaddi players. This study also proved that Rehabilitation are more effective to reduce pain and increase ROM in Experimental group. The result of this study is supported by Smith *et al*. who concluded that in case of knee injuries, Rehabilitation leads to significant increase in muscle strength and hence cause decrease in pain and general disability and increases ability to perform activities of daily living. Similarly Robert J. Patella says that Rehabilitation lessened knee pain and improved activities of daily living. R.C. Scaffer also improved significantly, Rehabilitation has better outcome on the basis of pain reduction.

So the studies given above supports the result of the current study that the efficiency of Rehabilitation in the treatment of Knee injuries in kabaddi are more beneficial in reducing pain, increase muscle strength and improve ROM.

Limitations and future prespective

Limitations of the Study

- Small number of sample subjects leads to limit the generalization of the study.
- Short availability of time for data collection limits the area under research.
- This study was conducted on Pain and Flexion ROM only.
- Study was conducted only on OPD patients receiving treatment in selected settings.

Recommendations

On the basis of the findings of the study following recommendations are-

- A similar study can be replicated on large sample to generalize the findings.

- Further research can be done on all the other movements affected and can be done on other joints.
- Study can be extended by comparing with other treatment modalities using a control group.

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