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The Effect of Bee Stinging and Rehabilitation Exercises on Some Physiological and Physical Variables of People with Partial Rupture of the Collateral Ligaments of the Knee Joint

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Abstract

The aim of this research is to identify the effect of bee sting and rehabilitation exercises on some physiological and physical variables of those with partial rupture of the side ligaments of the knee joint، as Sports injuries are a major and real problem that requires access to ways to treat and qualify athletes in less harmful and less expensive ways. Bee poison is one of the complementary medicine methods that has been spreading more in recent years, and that requires research to get to The validity and accuracy of this scientific information, The two researchers hypothesized that treatment at bee stings added to rehabilitation exercises has a positive effect on the physiological and physical variables under study. He used the method of one experimental set of experimental curriculum and pre- measurements, The research community identifies athletes with partial rupture of the side ligaments of the knee joint, The research sample reached 4 infected persons after one of the infected persons was excluded for non-compliance. The researchers used available scientific sources and references and also consulted experts and specia pre- lists to identify physiological and physical variables. After the pre- measurement of physiologi post cal variables (W.B.C, E.S.R), bee tingling sessions were applied for two weeks, three sessions per week,... after the completion of the sting sessions, the measurement of physiological variables was made, so that the sufferers would proceed to the application of rehabilitation exercises after the measurement of physical variables. (muscle strength knee joint, degree of bending of knee joint) as exercises included four weeks and each week included (6) Home units and (6) units in the sports hall, hence the measurement of physical variables, After the data was discharged, the conclusions were that the use of bee sting had led to a clear improvement in physiological and physical variables. It helped with the speed of recovery and this was reflected positively on the physiological variables and thus prepared the sufferers to perform rehabilitation exercises that played a positive role in raising the strength of the muscles working on the knee joint and reaching the degree of full bend of the joint. The use of bee sting in the treatment of sports injuries is the most important recommendation of this research, due to its effectiveness and the positive effect it achieved in the injury of the rupture of the lateral ligaments of the knee joint.

Keywords: bee sting ،rehabilitation exercises ،knee ligaments, rehabilitation, chronic mental illness.

One of the most important obstacles to the upgrading of athletes and the development of their abilities is sports injuries, where the player loses all the physical adaptations he has received compared to the pre-injury period, and the longer the distance period and the discontinuance of motor activity and regular training, the worse things get,

It has become noticeable that cases of knee joint injury have increased worryingly globally, becoming a global phenomenon with technical and medical dimensions. The majority of knee joint injuries are minor but at the same time they may become serious injuries, and may lead to an early end to the player's future if not treated in a timely manner. The knee joint is of large and complex body joints and has importance in walking and weight tolerance, The ligament surrounding the joint is the important and influential basis in the stability of the joint. It protects the joint from contortions and excess and sudden movements as well as the stability factor added by the muscle strength surrounding the joint. For the treatment of the athlete with partial rupture of the side ligaments of the knee joint we need rehabilitative therapeutic methods that rehabilitate the injured and help speed his return to normal before the injury occurs and return to the stadiums in a timely manner.

The use of bee products is one of the old complementary medicine methods that has been spreading recently. Bee poison is one of these products and is a biological compound that has an impact on the body and increases

its ability to resist as a result of its effective therapeutic elements that help to eliminate inflammation in the body. As well as the use of rehabilitation exercises which have a distinctive role to help in the rehabilitation of injuries, The importance of the research is reflected in the use of the therapeutic abilities of bee poison through direct stinging of bees with partial rupture of the knee side ligaments and then the application of rehabilitation exercises, thereby helping sufferers to heal and rehabilitate the injury and minimize the collateral damage caused by the use of other methods.

2. The aim and purpose of the research:

Does bee sting therapy gat us being followed by rehabilitation exercises have an impact on some physiological and physical variables accompanying the side knee ligament rupture injury, and is the rehabilitation therapeutic method used to help treat and rehabilitate the side knee ligament rupture.

3. Search procedures:

3-1 Research community and its Sample.

"It is the objectives that the researcher sets for his research and the procedures he uses that will determine the nature of the society or the sample he chooses." (1:217) The two researchers essentially identified the research community with partially torn athletes (middle grade) in the side ligament of the knee joint, where the search sample included (5) infected, and one of the infected was excluded for not committing to be the number of the sample (4) infected, through the cooperation of the competent physician * The injury was diagnosed by physical examination and magnetic resonance, thereby selecting the right individuals for the experiment and ascertaining their safety from other diseases that may hinder the work.

3_2 Study design.

The two researchers used the experimental curriculum in a one-set, and two-dimensional manner appropriate to the nature of the research problem.

3-3 studied variables:

(Bees sting and rehabilitation exercises) and physiological variables included (leukemia, blood cell deposition rate) and physical variables included (strength of muscles working on the knee joint, degree of bending in the knee joint).

Bee sting

The sting of bees is the process of using the bee itself as an injector where after grabbing the bee from the wings or the bra area by taping or by hand so that it does not fall on the bee pressure, it comes out of its name before it is placed on the place reserved for tingling in the patient's body, thus obtaining the bee poison compound and without losing any of its elements compared to taking it in other ways. (2:69)

Qualifying exercises

"It is a group of carefully selected exercises whose purpose is to correct or treat an injury or deviation from the normal condition so as to result in loss or disability when performing the full function of a member with the aim of helping that member to return to his normal condition to perform his full function." (3:172).

3-4 measurements used

3-4-1 Identification of physiological and physical variables:

Physiological variables (W.B.C, E.SR) and physical variables (strength of muscles working on the knee joint, and degree of bending of the knee joint) were identified. The two researchers used a number of previous sources and research references as well as experts and specialists * * through a form * * * prepared for this purpose.

3-4-2 Physiological variables measurement

The specialized medical laboratory was used, as the stages of the laboratory measurement process were as follows:

1. Blood samples were taken, an intravenous blood sample was taken and these blood samples were placed in custom tubes.
2. Extract the digital values of the physiological changes to be studied from the blood. This is based on the approved method of work in the medical laboratory and physiological variables (leukemia, blood deposition rate), for which normal digital levels are determined according to medical sources.

3-4-3 Physical variables measurement

First: Positive bending measurement of the knee joint:

Measured by the Goinometer "is a device designed to measure the angles to be measured by having different readings of this device in a manner commensurate with the nature of the sample and the type of injury." (4:43)

The purpose of measurement:

To measure the positive motor range in the injured knee joint when bent.

Tools used:

rug for lab reclining, genometer.

Description of measurement completion method:

The measurer sits next to the casualty on the injured knee side, and the injured person must be lying on the abdomen on the rug and put the measurement device (Genometer) On the side of the lateral meniscus knee joint, the knee joint forms an angle (90) degree, and then the injured individual is asked to bend his injured leg, thereby moving the arm of the device inward with the injured man, keeping the other in a state of persistence, and reading the angle between the arms of the genometer representing the angle of the bending, (5:9).

Second: Measuring muscle strength that works on the knee joint: (6:4)

This was done using a dynamic device.

The purpose of measurement:

To measure muscle strength that works on the knee joint.

Instruments used:

Dynamometer.

Performance specifications:

The dynamic device stabilizes the base, and the device is installed from the top of the iron chain which ends with a ring attached to the belt that wraps around the lab waist, and wraps around the middle of the tested individual a wide belt of skin and is below the belt of the device for protection and installation, the lab stands on the base, and then bends the knees (90) Degree the chain is attached between the device and the belt tied in the center of the laboratory, and when the starting signal is given to the laboratory it stretches the two men upwards trying to take out the maximum DIY force.

Test instructions:

The laboratory must maintain the straightness of the back and the payment is only by the two men. The laboratory shall not be allowed to lean head or back, the tightening is slowly on the dynamic device and without pushing once or suddenly the push should be to return the device indicator to zero point gradually after each attempt. Each player is given two attempts.

Scoring:

Scores the player the best attempt of both attempts.

5-3 exploratory experience:

It is a practical training for the researcher to identify the negatives and pros encountered during the research to avoid them." (7:107)

The survey was conducted on the date of (21/2/2022) on one of the injured persons, where the objectives of the experiment were as follows:

1. The researcher wishes to know the validity of the search sample and its responsiveness and acceptance of the experiment and measurements.
2. Know how many auxiliary teams a researcher needs to carry out tasks.
3. The working group shall identify the nature of each individual's work and roles.
4. Through the exploratory experiment, the efficiency, safety and relevance of the tools and devices that are used in the research process are ensured.
5. The researcher will know the correct procedures required to implement the measurements.
6. The appropriate measurement conditions to be taken when measuring the strength and motor range of the knee joint have been identified.
7. Know the time it takes to carry out all its tasks and also avoid problems or difficulties that may be encountered in the course of the work.
8. It has been ascertained that the injured person has the potential and capacity to complete measurements and implement them properly.

3-6 Main experience:

The sample is not available in such research, as the process of obtaining an infected sample of the experiment depends on the cases received to hospitals, sports and medical rehabilitation centers and specialized clinics. Thus, the measurements were continuous due to physiological and physical variables as well as the periodic application of the rehabilitation therapeutic method over the duration of the trial and according to the injuries diagnosed with the help of the competent physician. The application of the pilot curriculum to sample individuals continued during different periods and variously under the direct supervision of the researcher.

3-6-1 pre- measurements of physiological variables:

The first pre- measurement of physiological variables was carried out on Wednesday 23/2/2022 and was conducted before the application of experimental therapeutic methods to the research sample, where the specialist withdrew the intravenous blood sample from the infected arm of the sitting position and by the amount of (5 ml), and digital values of physiological research variables (W.B.C - E.S.R) were calculated In the relevant laboratory, he researcher stabilized the spatial and temporal conditions to standardize them, and the results were developed and stabilized with results discharge lists. The last measurement of physiological research variables was on Tuesday coincidence 20/9/2022.

3-6-2 The treatment method of living bee stings

The method of stinging live bees was applied to the research sample, since after conducting pre-measurements of physiological research variables, the sufferers were exposed to the tingling of live bees in the area of injury and the realities of a session for every three days, where they were conducted (6) Sessions for each infected person over a period of (18) days, and after the test of the sensitivity of the infected bee poison at the beginning of the first session, the affected area is cleaned with warm water and soap and then thoroughly cleansed, The bee intended for tingling is then lifted by a special taping from the small box placed in it to be placed on the target place. The bee tingles any sowing of its spear with the skin of the injured and leaves for three minutes to empty its content of the poison and then removed with the tingles. The propolio cream is then applied to prevent allergies, itching or swelling and redness in the tingling areas. Each infected person is given a box of cream that can be used when needed. The number of live bee tingles to which members of the pilot group were exposed at each session was distributed in order (2, 3, 4, 3, 4, 5), this was done with the assistance of the specialist * at the Nature Center Clinic for Supplementary Medicine Treatment.

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Figure (1) shows how to sting live bees

Figure (2) shows propolio cream used when need

3-6-3 post- measurements of physiological variables:

The first post-measurement of physiological variables was carried out on Monday 14/3/2022, where the specialist withdrew the intravenous blood sample. The measurement was performed in the same pre-measurement conditions. The results were developed and stabilized in the same lists. The last subsequent measurement of physiological research variables was on Sunday 9/10/2022.

3-6-4 Pre- measurements of physical variables:

The first pre- measurement of physical variables was performed on Tuesday 15/3/2022 for the research sample. This was before the application of rehabilitation exercises and after the completion of the application of experimental therapeutic methods and remote measurements of physiological variables. The muscle strength of the muscles working on the knee joint has been measured, As well as the positive bending of the knee joint, this was done at the specialized center for the rehabilitation of patients with cerebral palsy, difficulty walking, delayed pronunciation and rehabilitation of sports injuries in Qadisiyah governorate under the direct supervision of the researchers, Where the casualty score is fixed by each measure in the record for discharging results, The researcher stabilized the spatial and temporal conditions as well as the method of implementation of measurement and the number of attempts to standardize them for all members of the sample research in pre- and remote tests. The last pre- test for physical variables was on Monday, 10/10/2022.

3-6-5 Qualifying exercises *

Qualifying exercises were applied to the research sample after the pre- test of the physical variables of the research sample, The aim of the exercise was to improve the motor range and the strength of the knee joint, This was done by improving the muscle strength surrounding the knee joint as well as improving the tide and bend of the knee joint to help rehabilitate the partial rupture of the side knee ligaments and return the infected to normal before the injury occurs in terms of the muscle strength of the joint and motor range.

Duration of qualifying exercises

The duration of the qualification exercises took (4) weeks and (12) sessions per week. (6) home morning sessions and (6) evening sessions in the sports hall. The researcher took into account the duration of the workouts for the qualifying session and the non-use of long exercises. There was a gradual increase in the time of the rehabilitation units and in total the duration of the main part of the unit is no more than (30) minutes, and the exercises are the other ones that have experienced a gradient of difficulty, where grading has been done with qualifying exercises every week, It included fixed exercises without adding weights, fixed exercises with weights, Moving exercises without weights, moving exercises by adding weights with balancing and compatibility exercises, Qualifying exercises included strength and range exercises, and there was a gradual increase in intensity and volume through increased resistance to exercises and repetitions.

Figure 14 shows some qualifying exercises

3-6-6 Post- measurements of physical variables:

After applying rehabilitation exercises, the first post- measurement of physical variables was performed on Thursday, 14/4/2022, for the research sample, The muscle strength of the muscles working on the knee joint was measured as well as the positive bending of the knee joint at the specialized center for the rehabilitation of patients with cerebral palsy, difficulty walking, delayed pronunciation and rehabilitation of sports injuries in Qadisiyah governorate under the direct supervision of the researchers. Measurement is similar to pre measurement in terms of procedures or spatial and temporal conditions as well as the way in which measurement was carried out with the same devices and tools. My last post-measurement of physical variables was on Wednesday, 9/11/2022.

4- Presentation, analysis and discussion of results

4-1 - Presentation of the results of measuring the physiological variables before and after the research sample, analysis and discussion:

Table (1) shows the differences of arithmetic media between the pre- and post-measurements of the physiological variables of the research sample

Significant	Calculated T value	Post-test		Pre-test		Variables	T
		P	S	P	S		
0,001	11,939	0,340	5,475	1,112	11,25	WBC (k / ul)	1
0,003	9,451	0,500	6,25	4,041	24,5	ESR (mm / h)	2

Through the data extracted for the search sample we find in the measurement rate (WBC) the value of the computational medium for pre measurement was (11.25), the value of the deviation was standard (1,112), while the computational medium was for (WBC) in post measurement (5,475) and standard deviation (0,340), and using the researcher to test (v) correlated samples for the purpose of extracting discrepancies, where there were moral differences between pre and post measurements and for the benefit of post measurements, as the value of (i) Calculated at 11,939 and at the indicative level of 0.001, the computational medium of the oleocyte rate decreased and this indicates improvement and healing from inflammation.

In measuring the deposition rate (ESR), the value of the computational medium of pre- measurement was (24,500), the deviation value was standard (4,041), while the arithmetic medium was for (ESR) in post-measurement (6.25) and standard deviation (0.500), and using the researcher to test (v) correlated samples for the purpose of extracting discrepancies, where there were moral differences between pre and postost measurements and for the benefit of p measurements, as the value of (i) Calculated at 9,451 and at the indicative level of 0.003, the computational medium of the blood deposit rate decreased and this indicates improvement and healing from inflammation.

Discussion of outcomes:

The effect of bee sting use on the physiological variables of the research sample was significant, This is illustrated by comparing the computational circles of pre and post measurement where the differences were moral and in favour of post measurement. The values and return of physiological variables have decreased at the normal level and have increased as a result of the defensive state of the body after injury. Bee poison this complex compound has an effect on the whole body and increases the body's defensive ability, thus contributing to positive results.

In white blood cells(WBC) We note in pre measurement an increase in the rate of white blood cell sand this is the result of partial rupture of the side knee ligaments leading to inflammation in the body, where the body works to raise defensive abilities, control infections and repair the affected tissue, as Abdulwahab points out that "white blood cells is the cellular part. (live) from the immune system and possess great importance in the treatment of body infections and injuries to which they are exposed. "(8:11).

When compared to the calculated average of pre measurement by post measurement after the therapeutic period of bee sting, we note a decrease in the number of leukocytes and their return within the normal rate. This indicates a decrease in the incidence of inflammation, the healing of injury and the return of the body to its normal state. The research attributes this improvement to the effectiveness of the therapeutic method and its positive impact. It contributed to the return of the blood leukocytes to their normal level in infected people, The Yemeni indicates that bee poison as a biological compound possesses a complex composition that affects the whole body and increases its resilience. Where it is installed from hydrochloric acid, orthophosphoric, formic, sulfur, histamine, povan, Colesine and magnesium phosphate, as its ashes contain the effects of calcium and copper and also high in proteins and flying oils, It thus has a significant effect on the elimination of inflammation and also contributes to the improvement of the body's defences, (9:5).

Bee poison also contains militin, which is a strong ingredient that is resistant to inflammation. It is indicated that the strength of millitin in the response to inflammation is equal to (100) times the capacity of cortisol, (10:2).

As for the rate of blood deposit velocity (ESR) in pre measurement, there is a high rate of deposition velocity, which was a natural result of the body's defensive reaction to damage to its tissue due to the injury caused to the individual (partial rupture of the knee side ligaments).

The rate of blood deposit velocity increases in the case of acute inflammation resulting from injuries or chronic inflammation. The body subtracts its defensive proteins into the blood to the affected areas, which with a cycle leads to blood overload", (11:2).

By observing the calculated average value of pre measurements of blood deposition velocity) We find that it was high as a result of the exposure of the body to injury, and this is a natural thing that is accompanying the injury and is an accurate indicator of the degree of injury, but when you compare it to the value of the computational average of the post measurement of the rate of deposition, we find the decrease in the degree of

inflammation to the normal level. This shows the condition of infected people and their access to recovery after the therapeutic period with bee tingling, as a result of the effectiveness of the therapeutic method and its positive impact on the infected.

Bee poison is highly effective in resisting diseases, pains, infections, lifting and activating the body's immune and defensive capacity for the natural ingredients contained in bee poison. Bee tingling therapy is at the forefront of complementary medicine. "Bee poison has an antibiotic property which is equivalent to a thousand times the antibiotic penicillin and it can be used safely without weakening the immunity of the body and also unlike long-acting penicillin, the microbes cannot form immunity against poison. Bee poison contains adoline, a dwelling that is 10 times as powerful as morphine, which is used to relieve pain. Bee poison is also used as an anti-inflammatory and its use in treatment causes activation of the supra-renal gland to increase the normal cortisone secretion rate in the body. "(2:82).

Bee poison also contains hyaluronidase, which plays a major role as a component of bee poison, as it works to disintegrate the matter. (Hyaluronic acid) that binds cells to each other, allowing families to easily pass around cells. This in turn helps supply and deliver healing-assisting substances to the inflamed area and also helps to get rid of toxic substances that have accumulated in the inflammatory zone. (9:5).

4-2 Presentation of the results of measuring the physical variables before and after the research sample, analysis and discussion:

Table (2) shows the differences of arithmetic media between the pre- and post-measurements in the physical variables of the research sample

Significant	Calculated T value	Post test		Pre test		Variables	T
		P	S	P	S		
0,001	12,550	12,420	143,75	18,081	91,75	Strength (kg)	1
0,005	7,348	0,000	30	4,082	45	Binding Degree	2

Through the extracted data by the researcher for the research sample in measuring the strength of the muscles that work on the knee join , we find that the value of the arithmetic mean of the measurement was (91.75), and the value of the standard deviation was (18,081), while the arithmetic mean of the strength of the muscles working on the knee joint in the post measurement was (143.75) and its standard deviation was (12,420), and the researcher used to test (T) for correlated samples for the purpose of extracting differences, Where there were significant differences between the pre- and post-measurements and in favor of the post-measurements, as the calculated value of (T) reached (12,550) and at the level of significance of (0.001), which indicates the degree of improvement in the amount of force produced by the muscles that work on the knee joint, which proves the effectiveness of the exercises used and the treatment methods used.

As for measuring the degree of flexion of the knee joint, the researcher found that the value of the arithmetic mean of the pre-measurement was (45), and the value of the deviation was standard (4,082), while the arithmetic mean of the degree of flexion of the knee joint in the post measurement (30) and a standard deviation of (0.000), and the researcher used to test (T) for interrelated samples for the purpose of extracting differences, where there were significant differences between the pre- and post-measurements and in favor of the post measurements, as the value of (T) calculated amounted to (7,348) and at the level of significance of (0.005), Which indicates the amount of improvement in the degree of flexion of the knee joint, and the effectiveness of the treatment method and exercises used.

4-2-1 Discussion of outcomes:

The researcher found that the effect of the use of bee sting and rehabilitation exercises on the physical variables used in the research eye was distinctive. In the strength of the muscles working on the knee joint, the moral differences between pre and post measurements in the strength of the muscles working on the knee joint are shown by table (2).

When observing the computational average of pre measurements, we see a decrease in the ability of sufferers to produce force, which is due to the interruption of physical effort as a result of the injury and the inability of the injured to use the organ. Net indicates that the temporary interruption of regular training directed at the development or maintenance of fitness elements that occurs as a result of injury or at the end of the training season or for any reason will result in a decrease in physical qualities and the loss of physiological adaptations formed through training for several months And it can be degraded if you stop training for weeks, (12:37)

When comparing the computational medium of pre measurements with the computational medium of the post measurements of muscle strength on the knee joint, there is a significant evolution in the production of the force of muscle working on the knee joint. The researcher attributes this evolution in strength resulting from the efficacy of the bee tingling treatment method, Bee poison has a significant effect in healing the injury, eliminating inflammation and returning the infected organ to normal. As well as the effectiveness of rehabilitation exercises prepared by the researcher, which were based on scientific foundations and which played a significant role in the growth of muscle strength, The rehabilitation exercises used to rehabilitate those with partial rupture of the knee side ligaments varied between moving, static and mixed exercises with or without weight. The aim was to raise the muscle's ability to produce strength and reach the full motor range of the knee joint, The rehabilitation exercises took into account the anatomical composition of the joint and graded the tide and bend to it, which is what he pointed out to him (Jeffrey): "The use of static, mobile and mixed exercises has a clear impact on the development of strength, as strength increases by increasing the use of physical exercise and decreases if the part is not moved." (13:76) and as for the Rehabilitation exercises, it compensate for the loss of fitness due to muscle misuse or weakness, which may be one of the main causes of injury, as well as for the loss of muscle strength. Rehabilitation exercises increase the strength that can be produced by working muscles.

At the degree of bending of the knee joint, the moral differences between pre and post measurements and for the benefit of post measurement in the degree of bending of the knee joint are shown in table (2) in the research sample.

By observing pre measurements of sufferers, there is a determination in the degree of bending of all infected people and their inability to fully bend the positive knee joint, which is due to partial rupture of the side knee ligaments,

An injury to any part of the human body leads to a limited and inability to move it, as a side knee ligament injury limits the joint's ability to perform its functions fully, since the concept of qualification is that "The range is the ability to move the affected part to its maximum extent without pain and the ability to perform movements and technical skills, and any decrease in this range would have a negative impact on the performance of activity and motor skills." (14:71)

When comparing the computational medium of post measurements with the computational medium of p measurements to the degree of bend of the knee joint, we note the return of the full positive bending of the knee joint and the absence of any pain when the joint performs its function. The researcher attributes the bending degree to the normal range of effectiveness of bee tingling therapy and rehabilitation exercises, Bee poison is an effective and efficient complementary medicine method. It has had a significant impact on the healing of the injury and the preparation of the body for the stage of rehabilitation exercise, which has also played a significant positive role in the normal reach of the joint and its return to normal. The rehabilitation exercises were similar to the movement of the knee joint and its motor potentials are the main causes of the development of the motor range of the injured in the knee joint ligament, The similarity between the rehabilitation exercises used that are accompanied by increased mobility flexibility with motor range and the nature of joint movement is one of the main reasons why the motor range in this joint is improved. The results achieved in the degree of bending of the knee joint were the positive role of the qualifying exercises used as they contained negative and positive

exercises graded in the increase of repetitions as well as graduation is easy to difficult and thus play a significant role in restoring the motor capacity of the knee joint. Regular exercise has contributed to the restoration of the natural function of the joint of bending and tide, where Salem indicates that "Regular and gradual rehabilitation exercises have an effective effect on the demise of pain and thus increase the elasticity of the joint leading to an increase in motor range." (15:117)

Conclusions:

1. The researcher found that the use of bee stings showed a clear improvement in the physiological variables under study, as the use of bee tingling method contributed to the rapid recovery of the injury, reflecting positively on the physiological variables and returning their values to normal level.
2. The use of bee stings with rehabilitation exercises has shown a clear improvement in the physical variables under consideration. Treatment with bee tingling has helped to quickly heal the injury and thus prepared the sufferers to perform rehabilitation exercises, which have played a positive role in raising the strength of the muscles working on the knee joint as well as reaching the full extent of the joint at the bend.

Recommendations:

Based on the research results, the two researchers recommend the following

1. The use of bee tingling in the treatment of sports injuries for its effectiveness and its positive effect on the tearing of the side ligament of the knee joint and preferably accompanied or followed by rehabilitation exercises depending on the severity of the injury.
2. When using rehabilitative therapeutic methods for joint injuries, rehabilitation exercises whose motor range is similar to the installation of the anatomical joint must be adopted, thereby helping to improve the motor range and strength of the working muscles faster.
3. Physiological indicators should be taken into account when evaluating rehabilitative therapeutic methods for injuries, given accurate information on the severity of the injury and the degree of improvement.

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