



Doi: <https://doi.org/10.54702/msj.2021.20.3.0076>

## Effect of Rehabilitation Program by Using Hypermedia on Treatment Some of Shoulder Tissues Injuries for Badminton Players

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### Abstract:

The important of present study is to design rehabilitation program by using hypermedia for some injuries of smooth tissues in shoulder joint. This joint is most important to help badminton players in achieving their daily and sport tasks due to upper limb movements depend on health and active of this joint. Experimental approach with a manner of equal single station was used in present study and study simple consisted of 6 badminton players from Babylon and Al-Mahaweel clubs who have less sharp tissue smooth injury such (muscles, ligaments, pocket). We used (SPSS) to analyses pre, medal, post-tests data. In conclusion, hypermedia is positive benefit to rehabilitee of injuries of smooth tissues in shoulder joint for badminton players and we recommend that the important of using hypermedia by computer to rehabilitee injury players in other sport events.

**Keywords:** Hypermedia, Shoulder Joint, Badminton.

### ١. Introduction

The use of computer has recently spread in various fields of life. It has proved efficient and has provided a lot of effort, time and cost in the institutes of space research, banking, population statistics, business and budgets, architectural and engineering designs, medicine, sports and other fields. Today's world is experiencing the age of electronic computers, where a huge amount of information is being recorded on small, easy-to-handle media. In this era, the amazing information technology developments are taking place in various aspects. They have become a highly developed science that has succeeded in pushing civilization forward in a short time. This science is the control, collection, processing, storage, retrieval, transfer

and use of information. This is reflected in computers, video thumbnails, and telemedicine, and their interconnection within the framework of information technology. (10)

Hypermedia is an educational tool in which a complex set of cross-connections are combined in a sequence that suits the learner's abilities to create an environment that allows the learner to control and even place information at the fingertips by allowing the integration of graphics, sound and animation through this environment as well as dealing directly with Information stored on video tapes and computer disks and provides instant feedback. (12)

The activity of motor and sports is an urgent need of life necessities to keep abreast of the tremendous scientific progress in various areas of life in our time as a result of the introduction of modern technologies in most of life facilities and the availability of amenities.

The occurrence of any injury in the shoulder joint will inevitably lead to injuries in the soft tissue of the joint and thus affect the movement and may lead to a decline in movement. In cases of acute injuries caused by a sudden nonphysical movement outside the range of the motor range of the joint, it leads to soft tissue damage and high pain level and may need long treatment using methods known in the treatment as medical drugs and physiotherapy devices , and these methods often may not lead to quick and desired results, or healing of clinical injury and loss of pain, with the athlete unable to practice his daily life due to lack of strength or strength and range of motion.

Here comes the significance of the research in the design of a method of rehabilitation using super media for some soft tissue injuries in the shoulder joint. Because of this importance in helping the badminton players in the performance of their daily duties and sports because the movement of the upper part depends mainly on the safety and effectiveness of this joint.

## **٢. Research methodology and field procedures:**

### **٢,١ Research Methodology:**

Selection of the experimental approach in the design of the equivalent individual station.

### **٢,٢ Research Sample:**

The research sample was deliberately selected among badminton player injured with soft tissue injury (muscle, ligament, wallet) and for the semi-acute condition (\*), totaling (6) players from Mahaweel and Babylon clubs, the statistical package (SPSS) was used to

analyze the results of the pre and intermediate tests for review at Hilla Teaching Hospital - Department of Physiotherapy. The injuries were diagnosed by the specialist doctor. The sample was subjected to the main experiment after undergoing physical therapy using short wave, ultra sound, infra-red devices.

### 2.3 Steps to prepare the preparatory program:

#### Stage 1: Preparation of the Hypermedia scenario:

The researchers prepared the scenario for the program and how to prepare it and the angles of the photography and texts that will be placed in the program as well as the texts read when commenting on the exercises and as follows :

- ١..Identifying the overall format of the program and the work of planning on paper.
- ٢..Identifying the points of interest for each exercise and record them in. special forms
- ٣..Writing the texts that will appear in the program .
- ٤..Writing texts that will record a comment on performance .
- ٥..Selecting the images that will be the background of the program interfaces .
- ٦..Choosing the music .

#### Stage (2): Model photography:

Two models of badminton players have been nominated for the exercise photography for the planned program. Then the researchers conducted the photography after the closed gymnasium was selected at the Faculty of Physical Education / University of Babylon at 10 am on Sunday, 25/6/2021. After the completion of the preparation and arrangement of the film for photographing the model.

The cameras are set as follows, as shown in figure (1).

- 1.The first camera: placed on the left side and vertically at the lateral level of the model and at a distance of five meters .
- ٢.The second camera: placed at ٤٥ degrees angle with the model on the right side and five meters away..
٣. The third camera: placed at 45 angle with the model on the left side and five meters away.
4. The fourth Camera : This camera was shot from the top and used to shoot important parts of the performance also some movements of the parts of the arms.

The photographic process was accompanied by a photographic process, in which more than 150 photographs were taken, representing the different stages of the exercises using a



high-definition camera containing 2 kilobytes of memory to be transferred to the electronic calculator and used in the creation of the rehabilitation program.



Figure (1): Shows the location of cameras used in photography

### The stage(3) of recording the comment:

Record the voice comment of the tutorial using the Cool Record Edit Deluxe recording software, as shown in Figure (). The recording process took more than 15 days, including the sound recording process (\*), making adjustments, as well as converting the sound to files that can be managed easily in the main program to be prepared.

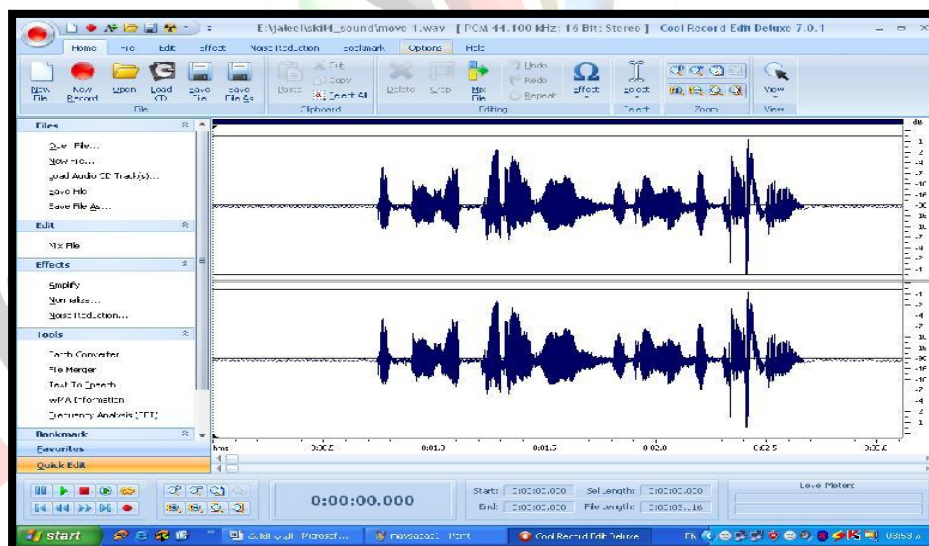


Figure (2): Shows the main interface of Cool Record Edit Deluxe

### Stage (4) : Text Printing Stage:

The researchers printed the texts to be placed in the qualifying program and delivered them to the programmer (\*\*) in the form of document files.

### Stage (5): Video processing of recorded films:

Using Media Studio Pro Ver. 8 and Xilisoft AVI MPEG Converter, and the film was processed and the purpose of this processing was to do the following:



١. Editing processes and delete unwanted snapshots.

٢. Combining the films with the four cameras .

3. Conversion of films of the raw type to the type that can be dealt with in the educational-rehabilitation program, which was prepared according to the following specifications:

(PAL ( 25 fps ) . MPEG files . 24 bite , 325 x 288 , 25 fps . Frame – based. ( Video data rate : 1150 kbps ) . ( Video CD – PAL ) 4:3 . Audio data rate 224 kbps . MPEG audio layer 2,44.1 KH , stereo) .

1. Organizing the files of the films recorded in the files in order to facilitate dealing with them in the subsequent research procedures.

The sixth stage: Program design stage.

For the purpose of design and preparation of the tutorial Multimedia Builder 4.9.8 was used as it is the best presentation programs and professional and small in size and easy to handle by the user as in Figure (3).

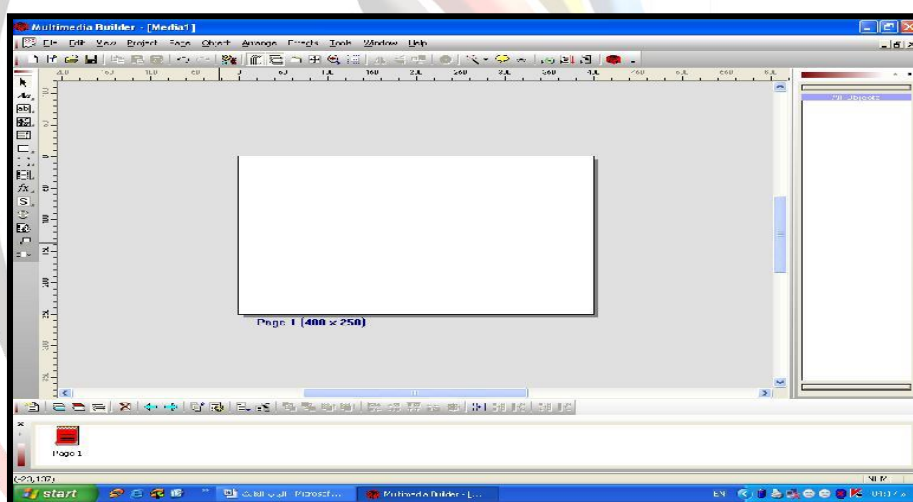


Figure (3): Shows the main interface of Multimedia Builder 4.9.8

The program is designed in the form of multiple interfaces to make it easier for the user to navigate and access the desired interface ..

**Note:** The researchers also used a series of films illustrating how to perform training exercises for shoulder joints of the Internet to benefit from the program.

#### ٢-٥ Field research procedures:

##### ٢-٥-١ Tests and measurements:

The researchers conducted a number of tests and measurements that are appropriate to the age of the research sample. After studying the scientific sources related to the subject of



rehabilitation and reviewing the previous studies on this subject as well as taking the opinion of experts, it has been found that the tests of strength, strength relay and motor ranges as well as using a questionnaire form for the purpose of measuring the degree of pain. Strength, flexibility (range of motion) and handling of force are among the criteria upon which therapists depend on the extent to which people respond to rehabilitation approaches.

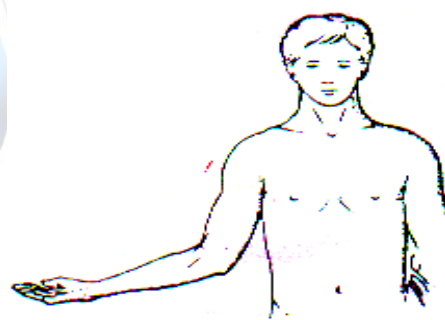
First: the measurement of the motor range of arms for men and women included:

١. Test the front bending measurement at the degree (0-180).
٢. Test the measurement of the backward tide at the degree (0-45°).
3. Test the approximation measurement (0-90°).
٤. Test dimensions measurement at the degree (0-180°).
٥. Test the internal rotation measurement (0-180°).
6. Test the measurement of the external rotation (0-180°).

As shown in the following figures :



Figure (5): Rotation of the angular angle (90°)



Figure( 4): Rotation of the lateral s (90°)



Figure (6): bending and extending at angle (45°)

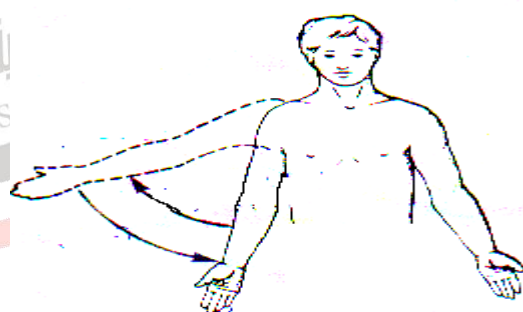


Figure (7): Dimensions and approximation at angle (90°)

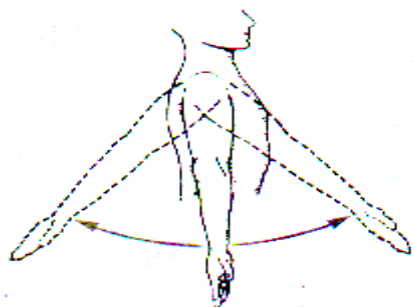


Figure (8): Rotation  
inside and outside at an  
angle (360)

### Second: Test the measurement of maximum forces:

The test of muscle strength using the Hand Grip Dynamometer is one of the most common strength tests.

This test is used as a treatment and as a tool to detect and diagnose certain diseases. Recovery may be accompanied by increasing muscle strength. It reflects the general body condition and is considered a high confidence choice. Experts believe that a person with strong grip can achieve a high level of strength and effort for long time. (1)

#### ٢-٥-٢ Pre, intermediate and post Tests:

The researchers conducted the first pre test on jul 8, 20٢١ and the first intermediate test on ٢٠/٧/٢٠٢١ and the first post-test on 12/٨/٢٠٢١

#### ٢-٥-٣:Qualitative Methodology Using Super Media:

The teaching approach was applied using The PC of each injured player at the start of rehabilitation the personal computer is played for 20 minutes with the films or the image prepared in the training program for the exercise before the implementation of the rehabilitation approach prepared for the performance of physical exercises for the rehabilitation of shoulder joint injuries, which are exercises without weight and exercises using weights within the main section of the rehabilitation unit.

The approach of rehabilitation included six weeks and three units per week followed the method of gradualism in the intensity of physical load and gradual difficulty in performing exercises and began to use exercises without weight followed by the use of body weight exercises and exercises with weights such as (iron dumbbell and iron bar). The player can also review the program of exercises performed on his personal computer as a homework and prepare for the next unit .



## ٢-٦ Statistical Devices:

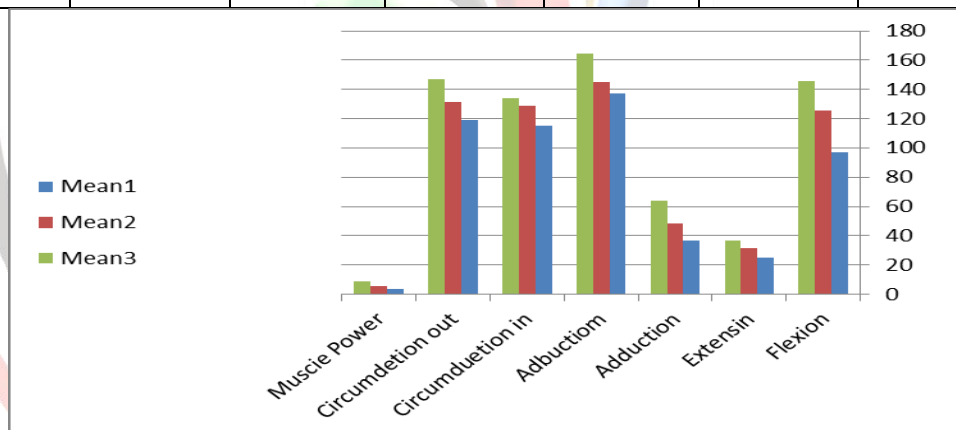
The statistical package (SPSS) was used to analyze the results of pre, intermediate and post tests. Where the use of: arithmetic mean standard deviation and test (t).

## ٣. Results :

Results of pre, middle and post tests under study .

**Table (1) between the arithmetic means and standard deviations of the variables under investigation in the three tests (pre-, middle, and post-test).**

Variables	Pre-tests		Middle tests		Post tests	
	M.	Sd.	M.	Sd.	M.	Sd.
Bending forward	٩٧,١٦٧	١,١٦٩	١٢٥,٣٣٣	٤,٣٢٠	١٤٦,٠٠٠	٢,٠٧٨
back tide	٢٤,٦٦٧	١,١٧٥	٣١,١٦٧	١,٨٣٥	٣٦,٥٠٠	١,٣٧٨
Rounding	٣٦,٣٣٣	٠,٨١٧	٤٨,٣٣٣	٤,٩٦٧	٦٣,٨٣٣	١,٩٤١
Deportation	١٣٧,٠٠٠	٤,١٩٥	١٤٥,١٦٧	٢,٤٨٣	١٦٤,٥٠٠	٢,٥٨٨
Rotate inward	١١٥,١٦٧	١,٨٣٥	١٢٩,٠٠٠	١,٤١٤	١٣٤,٠٠٠	١,٤١٤
Rotate outward	١١٨,٨٣٣	١,١٦٩	١٣١,١٦٧	١,٣٢٩	١٤٧,١٦٧	١,٦٠٢
Maximum strength	٣,٣٣٣	٠,٥١٦	٥,٦٦٧	٠,٥١٦	٨,٦٦٧	٠,٥١٦



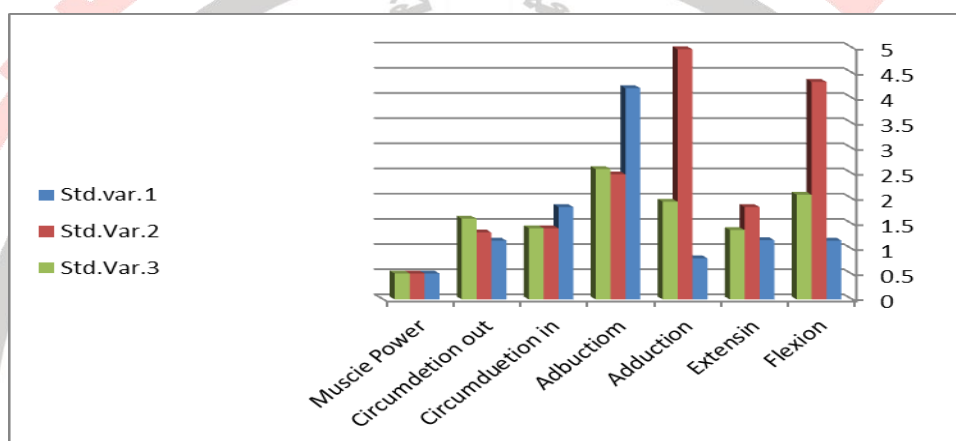
**Figure (9): Between the ,mean of the variables under examination in the three tests (pre, intermediate, post).**

**Table (2) shows the analysis of variance between the three tests (pre-test, median, and post) for the variables under investigation:**

Variables	Contrast source	sum of squares	degrees of freedom	mean squares	(F) value	Error rate	Statistical decision
Bending forward	between	٧٢١٠,٣٣	٢	٣٦٠٥,١٧	٤٢١,٩٣	٠,٠٠	incorporeal
	inside	١٢٨,١٧	١٥	٨,٥٤			
back tide	between	٤٢١,٤٤	٢	٢١٠,٧٢	٧٥,٨٦	٠,٠٠	incorporeal



	inside	٤١,٦٧	١٥	٢,٧٨			
<b>Rounding</b>	between	٢٢٨١,٠٠	٢	١١٤٠,٥٠	١١٧,٥٧	٠,٠٠	incorporeal
	inside	١٤٥,٥٠	١٥	٩,٧٠			
<b>Deportation</b>	between	٢٣٩٣,٤٤	٢	١١٩٦,٧٢	١١٧,٨٤	٠,٠٠	incorporeal
	inside	١٥٢,٣٣	١٥	١٠,١٦			
<b>Rotate inward</b>	between	١١٤٢,١١	٢	٥٧١,٠٦	٢٣٢,٥٦	٠,٠٠	incorporeal
	inside	٣٦,٨٣	١٥	٢,٤٥٦			
<b>Rotate outward</b>	between	٢٤٢١,٧٨	٢	١٢١٠,٨٩	٦٣٧,٣١	٠,٠٠	incorporeal
	inside	٢٨,٥٠	١٥	١,٩٠			
<b>Maximum strength</b>	between	٨٥,٧٨	٢	٤٢,٨٩	١٦٠,٨٣	٠,٠٠	incorporeal
	inside	٤,٠٠	١٥	٠,٢٧			



**Figure (10): Shows the standard deviations of the variables examined in the three tests (pre, intermediate, post).**

To identify the significance of the differences between the three tests (pre - middle - dimensional) of the variables under study as shown Table (3) below:

**Table (3) shows the arithmetic means and their differences, the calculated (Tukey) value, and the significance of the differences between the three research tests (pre, .medium, post) in all the variables under study:**

Variables computed	Totals	Difference of means	Standard error	Tukey value	Statistical decision
<b>Bending forward</b>	<b>Pre-middle</b>	٢٨,١٦٦٧	١,٦٨٨	٠,٠٠	incorporeal
	<b>Pre-post</b>	٤٨,٨٣٣	١,٦٨٨		
	<b>Middle-post</b>	٢٠,٦٦٧	١,٦٨٨		
<b>back tide</b>	<b>Pre-middle</b>	١٣,٨٣٣	٠,٩٠٥	0.00	incorporeal
	<b>Pre-post</b>	١٨,٨٣٣	٠,٩٠٥		
	<b>Middle-post</b>	٥,٠٠٠	٠,٩٠٥		



<b>Rounding</b>	<b>Pre-middle</b>	١٢,٠٠٠	١,٧٩٨	٠.٠٠	incorporeal
	<b>Pre-post</b>	٢٧,٥٠٠	١,٧٩٨		
	<b>Middle-post</b>	١٥,٥٠٠	١,٧٩٨		
<b>Deportation</b>	<b>Pre-middle</b>	٨,١٦٦٧	١,٨٤٠	٠,٠٠٠	incorporeal
	<b>Pre-post</b>	٢٧,٥٠٠	١,٨٤٠		
	<b>Middle-post</b>	١٩,٣٣٣	١,٨٤٠		
<b>Rotate inward</b>	<b>Pre-middle</b>	١٣,٨٣٣	٠,٩٠٥	0.00	incorporeal
	<b>Pre-post</b>	١٨,٨٣٣	٠,٩٠٥		
	<b>Middle-post</b>	٥,٠٠٠	٠,٩٠٥		
<b>Rotate outward</b>	<b>Pre-middle</b>	١٢,٣٣٣	٠,٧٩٦	0.00	incorporeal
	<b>Pre-post</b>	٢٨,٣٣٣	٠,٧٩٦		
	<b>Middle-post</b>	١٦,٠٠٠	٠,٧٩٦		
<b>Maximum strength</b>	<b>Pre-middle</b>	٢,٣٣٣	٠,٢٩٨	0.00	incorporeal
	<b>Pre-post</b>	٥,٣٣٣	٠,٢٩٨		
	<b>Middle-post</b>	٣,٠٠٠	٠,٢٩٨		

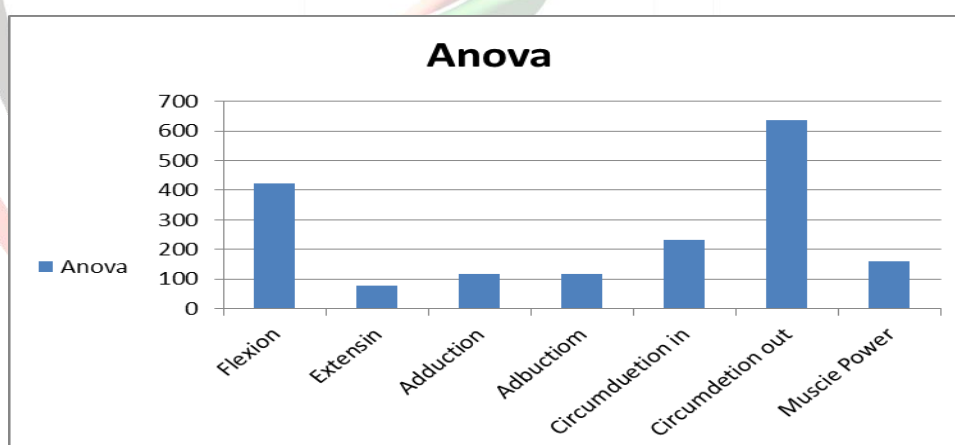


Figure (11): Shows the analysis of the variance between the three tests (pre - intermediate - dimension) of the variables in study.

### Discussion of results :

Through what has been shown in tables (1, 2, 3) there were significant differences between the three tests (pre - middle - dimensional) and the research variables and for the

benefit of the post tests. The researchers attributed the reason to the use of multimedia has had a positive impact. This method (multimedia) helps learners to focus on details and increase their interaction with them and thus respond effectively or performance. (7)

The computer is an appropriate tool for learning because it is a two-way communication and interaction tool. The computer diversifies the presentation of information and enables the learner to interact continuously and works to move the learner from success to success. The positive interaction that is available in the computer distinguishes it from others. Of the various means of education and make it the best educational tool known to man to this day. (2)

The researchers suggest that the proposed approach using hypermedia has helped to provide the affected players with a large amount of feedback, which has contributed to the repair of a large amount of their mistakes in the exercise and thus improved the results of the qualification, and this is confirmed by Ahmad Abdel Fattah (2001) Through the computer within the educational units or rehabilitation leads to the clarity of the educational duties required to be implemented during the activities of the educational unit or qualification, leading to a clearer understanding of the movements performed and then able learner or player to complete the motor duty accurately and economy Time and effort is reflected on the level of motor performance. (5)

The researchers attribute this development to the practice of the members of the research sample for the contents of the various rehabilitation approach, which or their movements for a particular motor range require them to perform movements that they did not bring to a certain range of motor, and with their participation in the therapeutic approach they have to perform new movements on them and have a range of locomotion not used to it The researchers believe that all exercises have had a significant effect on increasing the elasticity of the joint through the keenness of the researchers to perform the physical exercises included in the approach in the maximum extent of its dynamic (as a positive flexibility) sometimes and the patient applies the words of the rehabilitation curriculum correctly? In order to reach the maximum extent possible (as negative flexibility) other times as each daily warm-up unit in the approach included exercises for lengthening and flexibility all this led to the development of the dynamic range and this development or improvement agrees with Manqla. (9) From Riddle, Kusinits and Keeny, which indicated "the possibility of development and development of flexibility in the joints using positive flexibility exercises

and negative flexibility. Which the researchers attributed to the fact that the rehabilitation exercises used in the rehabilitation approach had an effective effect in this development in the motor ranges, which was the flexibility of the basic role in this development and how to develop as well as the rest period in the approach had a great impact in reducing pain and eliminate inflammation When rest and reduce effort, the blood and lymphatic fluid absorb the fluid (3). And the use of physiotherapy equipment in the first week, which started with the method of rehabilitation has reduced pain and increase the amount of blood entering the region and thus reduce inflammation by increasing the amount of white blood cells. (11)

The improvement in the motor range is due to the good psychological state resulting from the acquisition of the research sample of many of the experiences of success during the exercise, which flexibility is affected by the psychological state. (6)

The comfort provided in the approach was positively affected by the injuries, especially in the first weeks, which led to the relaxation of muscles and ligaments in the affected area. "Rest is used to reduce the severity of the injury and create a suitable environment for recovery. (4)

As for the muscle strength of the joint, the researchers attribute this development in the post-test to the fact that the use of the method in its individuality and regularity in its application and constant supervision by the researchers had a great impact on the continued development and growth of the force compared to the low pain, and means that the syllabus of the approach was consistent with some of the use of rest and physical exercises and the use of stationary exercises, exercises and mixed exercises had a clear impact in the development of strength and this is consistent with "The development of moral strength is the selection of exercises and static and moving lead during the training approach to reach better results for the development of a class strenght "(8).

**4- Conclusion:** Through the results, the researchers concluded that the use of super media in the implementation of the approach to rehabilitate the soft tissue of the shoulder joint has a positive effect on the injured badminton players and ensure their speedy return to the courts. The researchers recommend the use of hypermedia (computer-aided hypermedia) in the rehabilitation of players with Vicky sports. Research and other studies to investigate the effect of hypermedia in the treatment of athletes and non-athletes with other injuries.

#### **Acknowledgment:**

We would like to thanks all the team that works on this research and especially the Dean of Al-Mustaqbal university College represented by Assist. Prof. Dr. Hassan Shakir Majdy for the financial support provided to complete this research.

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