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Scaling Up a Rehabilitation Programme for Knee Osteoarthritis Through Escape-Knee Pain Programme

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Abstract: ***Background: To understand the effect of exercise - based treatment for people suffering with knee osteoarthritis by providing them integrated rehabilitation along with education through - Enabling self - management and coping with arthritis knee pain through exercise, ESCAPE - knee pain programme. Method: A comparative study was conducted with people with knee osteoarthritis of n=30, who were divided into two groups, each group having a different treatment set up, (Group - A=15, Group - B=15). Thematic analysis was used to document people's pain level along with psychological status and to see how both groups have shown effects by these treatments before and after being involved in the programme. Results: In the beginning, patients had poor understanding and negative thoughts about the programme for knee pain in both the groups. Following the programme most of the patients in both the groups had positive impacts towards their treatment protocols. Participants involved in the interventional group described that the use of exercise - based rehabilitation along with education for the condition made them realize that it is important to understand the pathology behind the condition along with exercises playing an important role to treat their condition. The control group also showcased significant impacts upon treating them with electro modality along with home advice. Overall, both the groups had a great significant impact in reducing the anxiety levels along with improving their pain and functional mobility levels. Conclusion: The Escape knee pain programme is said to be effective in treating people with knee osteoarthritis as its exercise and education component showed good results on reducing pain and psychological status of patient suffering with knee arthritis also on upon usage of electro modality along with home advice component helped people to decrease pain and sufferings and made them stable to believe in the integrated rehabilitation programme.***

Keywords: knee osteoarthritis, exercise - based treatment, rehabilitation programme, pain management, psychological status, Ultrasound, conventional therapy

1. Introduction

Knee Osteoarthritis is the most common chronic degenerative joint disorder and a major public health problem associated with cartilage degeneration and joint deformity, leading to joint pain and subsequent impairments in health - related quality of life. [1 - 3] OA knee is typically accompanied by chronic pain eventually ending up functional activities causing psychological stress in thought of becoming dependents.[4] Patients suffering from chronic painful disabling conditions frequently report anxiety and depression as comorbidities.[5] There are various studies that has shown sources of treatments for improvising knee osteoarthritis, one of the studies states that the exercise therapy alone potentially relieved symptoms and improved functional status of the knee osteoarthritis population.[6 - 7]However the belief for use of electrotherapy and modalities has become greater adaptivity in people as an effective treatment than believing in the exercises. The most common types of electro therapies are ultrasound, a modality of treatment that uses sound waves to generate heat within a body part.8but few studies also mentioned that self - management programmes[9 - 12] and exercise[13 - 14] improve physical and psychosocial health and wellbeing.

These interventions are usually delivered separately, but integrating self - management strategies with active participation on an exercise regimen might enhance the separate effects.

To understand better outcomes, we devised a study which include application of modality along with home advices and a rehabilitation programme that enables patients suffering from knee arthritis to cope up with their pain through exercises called ESCAPE - knee pain programme and to see the results before and after application into these protocols of patients have experienced their pain levels along with psychological status in both groups.

Therapeutic Ultrasound modality is used as a complementary treatment in physical therapy that focused on managing pain and aiding in the healing of soft tissue injuries.[15] The treatment exerts therapeutic effects through thermal (continuous US) and non - thermal (pulsed US) modalities through a variety of applicational parameters (i. e., intensity, wavelength, duty cycle, and frequency) [16]. Continuous Ultrasound achieves the thermal effect and is purported to produce analgesia through temperature elevation, which increases capillary permeability and tissue metabolism, thereby enhancing fibrous tissue extensibility and pain thresholds.

The other rehabilitation programme included here is the Enabling Self - management and Coping with Arthritic knee pain through Exercise (ESCAPE - knee pain), that has an exercise component along with educational sessions that explains the patients basic coping and self - management strategies and ease. The goal is to improve patients' knowledge of their condition, addressing their beliefs, providing them advice on what to involve for better outcomes, and upon completion of the exercise sessions which lead patients to understand their ability and banes of involvement into regular physical activity.

My proposition was to understand the effect in terms of pain and functional mobility along with psychological status

particularly about anxiety in patients participating in the programme.

2. Methods

Study design:
This study was a random comparative study design.

Participants:
The patients suffering from knee osteoarthritis more than 6 months were recruited from VAPMS College Of Physiotherapy outpatient department and King George Hospital physiotherapy department, Visakhapatnam. They were identified based on general medical records along with clinical diagnosis. An appeal form for participating in the study were provided in the department, patients included in the study are from of age from 40 - 70 years, irrespective of the side involved and both the genders were equally welcomed. Patients were excluded from the study who has undergone history of Arthroplasty, any intra articular injections or any unstable medical conditions related to systems like cardiovascular, respiratory or neurological disorders.

After close examination and assessment, a total of 45 patients were sorted out for the study, out of which 30 patients shown up interest to be a part of this study for a period of 6 weeks.

Participants attended an initial assessment at the physiotherapy department when anthropometric details and history of their, drugs and other associated was documented and consents forms of related study were provided and explained them in both local and standard language. Outcome Measures:

The key outcome measures used in the study are Western Ontario and McMaster Universities osteoarthritis index physical function sub-scale (WOMAC (func)) and the hospital anxiety and depression scale (HADS).

It has total 24 items and three subscales, namely pain (5 items), stiffness (2 items), and function (17 items), scored on five - point ordinal scale, 0 - none, 1 - mild, 2 - moderate, 3 - severe, and 4 - extremely severe. Higher WOMAC scores indicate worse pain, stiffness, and functional limitations.[17] This scale can easily be filled up by a patient or therapist.

The hospital anxiety and depression scale (HADS). This evaluated the level of anxiety (seven questions) and depression (seven questions) on a 4- point scale (minimum score = 0, maximum score = 21).[18]

Both the scales were assessed before and after taking part in the study for six weeks and the scores were used for data analysis to look for the results.

Intervention:
The 30 patients were randomly divided into two groups for the two protocols, each group consisted of 15 members of each.

Control group:
This group of patients were allotted to have a treatment prescribed as ultrasound along with home advice as a part of study. They received the treatment with parameters as mode of continuous with 0.1Wcm square and frequency, intensity as 0.75 to 1MHz along with a duration of 5 to 8 minutes for 4 sessions in a week up to 6 weeks.

The home advice provided to them included advising them to have cold packs, have good sleep and maintain a lifestyle.

Interventional group:
Well, the rest of the patients were given the integrated rehabilitation programme called ESCAPE - pain knee programme. It was delivered twice a week for six weeks in a total of 12 sessions. The protocol included two components called exercise and educational components.

The exercise component included a varied number of exercises which were part of to improve strength, balance, coordination, control and function. The exercises were designed according to the FITT principle.

The educational component included to explain and educate patients for pathology underlying for osteoarthritis, benefits of exercises, diet and drug management and coping up strategies against pain and anxiety. Each educational session used to be for 20 mins.

3. Data Analysis

The data was collected and documented for initial scores of WOMAC AND HAD scales is mentioned in Table 1.0 and 1.1. after obtaining the scores paired and unpaired "t" test was calculated using help of spss software which are mentioned in table 2.0, 1, 2, 3 respectively.

Table 1: Detail information about pre and post assessments scores of interventional group (ESCAPE - KNEE PAIN)

Patient No.	Age	WOMAC		HAD	
		PRE	POS	PRE	POS
1	51/ male	91	89	14	13
2	51/ male	90	89	14	12
3	63/male	86	84	9	8
4	64/female	90	88	14	9
5	60/female	90	87	14	13
6	48/female	89	86	9	13
7	58/male	91	88	14	11
8	48/male	87	85	7	13
9	43/female	83	82	8	10
10	50/female	84	84	8	12
11	44/female	84	83	8	8
12	49/male	88	85	9	9
13	64/female	90	88	14	10
14	53/female	86	84	10	11
15	50/female	86	84	8	9

*All the data collected on different dates

Table 1.1: Detail information about pre and post assessments scores of control group (ultrasound and home advice).

Patient No.	Age	WOMAC		HAD	
		Pre	Post	Pre	Post
1	43/female	91	88	8	7
2	45/female	90	89	10	8

3	43/female	88	85	8	8
4	42/female	90	86	9	7
5	50/male	90	87	14	12
6	48/female	90	86	9	8
7	46/female	91	89	7	5
8	41/male	87	86	9	7
9	43male	83	81	8	7
10	45/male	84	82	10	9
11	75/female	86	82	13	12
12	60/female	89	84	12	11
13	48/male	90	88	13	10
14	43/male	86	84	8	6
15	48/male	86	84	11	10

*All the data collected on different dates

Table 2: Paired "t" test of WOMAC scale for both the groups.

Groups	Variable	Mean	DOF	SD	SE	T Value	LOS 5%
Control	PRE	87.6	14	2.7	0.7	1.85	<0.10
	POS	86.08	14	2.7	0.7		
Interventional	PRE	87.6	14	2.7	0.7	2.21	<0.05
	POS	86.06	14	2.3	0.6		

Table 2.1: Paired "t" test of HAD scale for both the groups.

Groups	Variable	Mean	DOF	SD	SE	T Value	LOS 5%
Control	PRE	87.6	14	2.7	0.7	1.8	<0.10
	POS	86.08	14	2.7	0.7		
Interventional	PRE	12.3	14	2.19	0.5	2.15	<0.05
	POS	10.7	14	2.8	0.4		

Table 2.2: Unpaired Paired "t" test of WOMAC scale for both within the groups.

Groups	Post – Mean	DOF	SD	SE	T Value	LOS 5%
Control	85.8	28	2.7	0.7	-4.3	<0.05
Interventional	86.06	28	2.7	0.6		

Table 2.3: Unpaired Paired "t" test of HAD scale for both within the groups.

Groups	Post – Mean	DOF	SD	SE	T Value	LOS 5%
Control	8.4	28	2.13	0.5	3.09	<0.10
Interventional	10.7	28	1.8	0.4		

4. Results

A total of 30 subjects were included in the study and were divided into two groups (control and interventional), 15 in each group. Control group had undergone ultrasound along with home advices. Whereas, interventional group had been done with escape pain programme protocol.

Outcome measures used were The Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) scale and Hospital Anxiety and Depression (HAD) scale. Comparison within the groups was done using paired t test and comparison between the groups was done using unpaired t test.

In The Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) scale, the mean and standard deviation before the intervention of the interventional group were (escape pain programme) within the groups are 87.6 ± 2.7 and 86.06±2.3 respectively (p value < 0.05). The mean and standard deviation before and after intervention in the control group was (ultrasound and home advices) within the group are 87.6± 2.7 and 85.8±2.7 respectively (p value <0.10). The mean and standard deviation between the group control and interventional were 86.06. ±2.3 and 85.8±2.7 with a mean difference of (p value <0.05).

In the Hospital Anxiety and Depression (HAD) scale, the mean and standard deviation before and after the intervention in interventional group was (ESCAPE - PAIN) within the group are 12±2.19 and 10.7± 1.8 respectively (p value <0.05). The mean and standard deviation before and after the intervention in control group (ultrasound and home advices) within the groups are 9.9±2.18 and 8.4±2.13 respectively (p value <0.10). The mean and standard deviation between the both groups are 10.7±1.8 and 8.4±2.13 with a mean difference of 3.9 (p value <0.05). hence both the groups have shown significant results.
The results shown that both escape pain programme protocol and ultra sound along with home advices are effective in treating knee osteoarthritis.

5. Discussion

The conducted study gave an impression that the usage of ultrasound along with home advice and the new introduction of integrated rehabilitation Escape knee pain programmes, both were safe, feasible, specific and been accepted by the patients suffering from knee osteoarthritis. Despite the outcomes there are few limitations. The small number of sample sizes would not be able to provide accurate results to establish the actual difference between the protocols.

However, the study was conducted to understand the ease of acceptance of programmes in treating knee arthritis as part of professional development of the field, of all which went good. it also establishes that when the trial is subjected to a larger number the clinical effectiveness can be quite evident.

In addition, diagnosing knee arthritis was quite a daunting task as patients complained of many other features that were quite relative to other clinical conditions. Other limitations that can be pointed out for further reference are the to make the patient believe for the rehabilitation programme that was not included with electro modalities.

Many patients were adapted to other modalities that gaining trust from the was little challenge that has been faced by the therapist. Also motivating the patient's for continually regular exercises and educational components so that they follow the guidelines was also a biggest task.

The most important hurdle in OA management is identifying and classifying patients who will benefit most from treatment. Further efforts are needed in patient subgrouping and developing prediction models.[19] The present study successfully recruited patients suffering from knee osteoarthritis as these were sorted out from medical records after being diagnosed by medical practitioners along with evident clinical proof. The interest to be a part of this programme was as high as 70% than previous studies that were withdrawn in the middle of loss of interest[20]. The

benefits obtained by the study are of similar kind which were obtained on individual bases.[20, 21].

The effect of continued ultrasound did not seem to be similar for everyone as the stage of each patient differed from other yet optimising the same parameter for everyone was beyond thoughts hence the application was not up to the mark. Few studies also mentioned the same that even upon rationalising beneficial effects can be seen as the waves of ultrasound are unipolar[22]. The significant aspect of this study, unlike other studies, is that it has been made distinguishable to see pure differences between ultrasound and a standard rehabilitation programme. Only few studies have done such experiments and have seen only bare responses because of involvement of excessive presence of exercises rather than modality presence[24].

The other important aspects are educational component involvement which enhanced patient understanding towards condition and made it possible to attain reasonable effects. Few studies stated that the education can be recommended alone and in combination with exercise or manual therapy to improve function in subjects with pain related to hip or knee OA[24]. but it also has to carefully observe that alone education of patients will not give them good results.

The prescription exercise component depends on FITT principle as a matter of standard but this can be modified according to the type of study conductance. A study stated that various types of exercise calculators are available which can be used according to the condition[25].

The potentiality of this study has shown that the programme for knee osteoarthritis is possible and reconcile and has accuracy, but needs more exacting design which involves an assessment and should be of cost-effectiveness.

6. Conclusion

To determine accessible and appropriate interventions for patients suffering with knee osteoarthritis that can be treated at every convenient possible area would be beneficial to all patients. The idea of combining two different protocols was to see a chance of possibility that can be serviceable to people if it gets successful. The presented comparative study implies that the effect of ultrasound along with home advice and the integrated rehabilitation programme called ESCAPE - knee pain explained are specific, adaptable, time bound and accurate. The protocols used in this study are economically adapted and can be performed with ease. Explained a detail information about the present study in the diagram 1.0.

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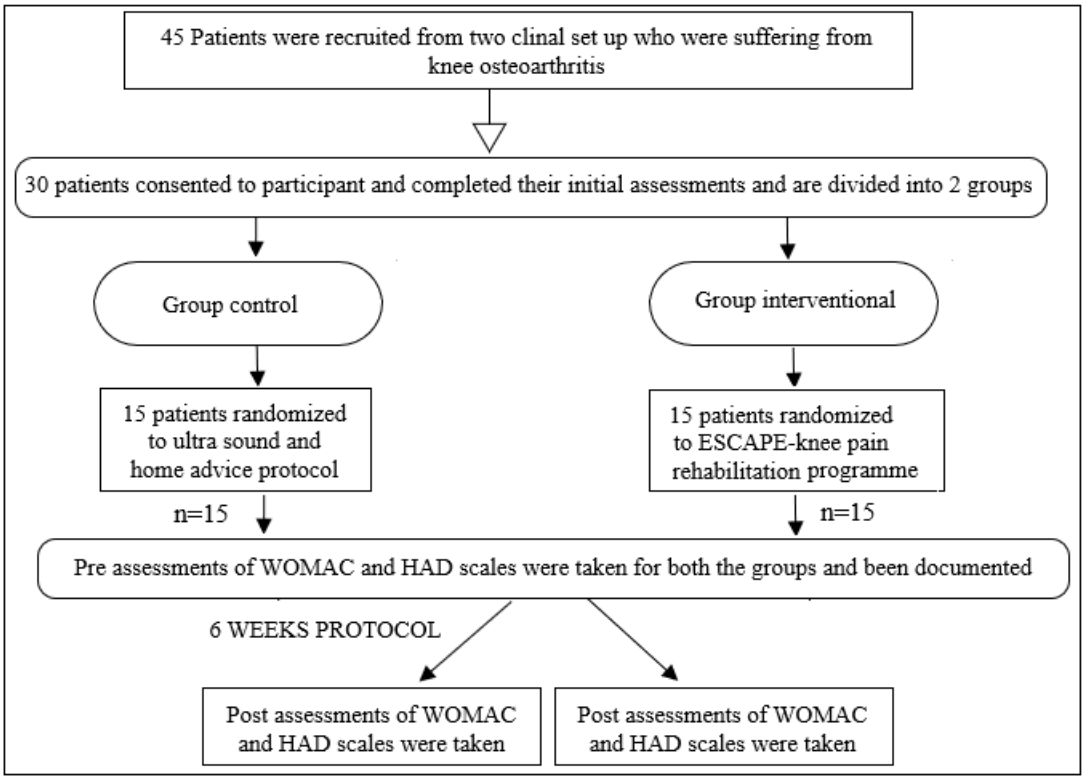

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