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Postural Disorders in Patients with Hip Implants

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ABSTRACT: *The use of prosthetic devices has revolutionized the treatment of disabling conditions such as osteoarthritis and rheumatoid arthritis. By failing to assess the full importance of physical therapy, some patients who underwent successful hip replacement surgery reported complications because surgery was not followed up by proper course of physiotherapy treatment. Patients need to become better aware of their condition and follow through with post-operative care. In recent years, technology has developed numerous prosthetic models inspired by different mechanical and biological principles, so as to better reproduce the articular physiology. Hip replacement surgery has a better chance of success in function and in patient satisfaction if accompanied by post-operative rehabilitation. In our study, rehabilitation was carried out according to specific objectives, followed by a series of successive stages followed, depending on the type of surgery performed and the patient's prosthetic. The rehabilitaion plan in our study successfully ensured that patients could listent to their bodies, becoming more aware of them by providing patients with the information and tools to be able to intervene in case of pain and functional limitations.*

Keywords: *Hip arthroplasty, home exercises, manual movements of patients, postural disorders, physiotherapy treatment*

1. INTRODUCTION

The application of a prosthetic device is designed to restore joint mobility when compromised and becomes necessary when the articulation undergoes serious damage. Surgery may be the natural and logical solution for a high percentage of healing and success, needs to be integrated with a specific physiotherapy intervention. [1] In this paper, we propose an additional home treatment session per week to the standard three-month physiotherapeutic post-operative treatment standard of three months to prevent complications. Once the patient leaves the hospital, part of the rehabilitation treatment is an informative, educational phase at home. The program includes prevention, care and knowledge necessary for the patient to take care of himself. We want to show that not only direct, specific physiotherapy holds a primary importance, but also prevention, effective strategies, practical tips such as adopting correct posture can markedly improve the patient's quality of life. [2]

2. MATERIALS AND METHODS

The study ran from September to mid-December 2015, (lasting approximately 3 months). The 18 patients recruited for the trial were divided into two groups. Group 1 (9 subjects) underwent physical therapy treatment at home. The control group, Group 2 (9 subjects), did not have physical therapy. The selection of patients and their division was done in accordance with the inclusion criteria.

2.1 Inclusion criteria

Due to the high number of patients with hip fractures, the study focused on patients aged between 59 and 87 years, who underwent prosthetic surgery of one hip because of fracture. Subjects were both male and female, all were employed, and they had to be residents in Tirana (as the work was carried out at home had to be easily accessible). The patients included in the study did not undergo a pre-operative physiotherapy treatment.
The prosthesis used was of metal alloy with pressure fastening

- Group 1: (patient 2 and 9) total joint replacement,
- group 2: (patient 7) total joint replacement,
- others: endoprosthesis

2.2 Composition of the groups

During the first week of post-op physical therapy, each subject was informed of the purpose of our study. All participants provided written consent. In order to put together the two groups, the conditions of the patients and their availability were taken into account. Division of the group was determined by the age of the subjects and the degree of cooperation by the patient during early treatment in hospital.

2.3 Patients

2.3.1 Data processing of Group1subjects.

Table 1: Group 1composition

Name / Surname	Age	Gender
1) E. M	64	F
2) U. M	67	M
3) T. D	65	F
4) R. SH	64	F
5) B. K	68	F
6) S. L	67	F
7) E. S	66	M
8) A. B	65	F
9) O. Z	66	M
GROUP 1	Average age 65.7	

As can be noted, women between 64 and 68 are more susceptible to hip fracture than males and hence to hip replacement surgery. 7 patients (1,3,4,5,6,7,8) underwent the endoprosthesis surgery while 2 male subjects (2 and 9) underwent a total arthroplasty hip surgery.[3]
2.3.2 Data processing of Group2 subjects.

Table 2: Group 2 composition

Name / Surname	Age	Gender
1)T. L	67	F
2) R. Y	68	F
3) S. M	65	F
4) F. K	69	F
5) J. S	63	M
6) H. H	68	M
7) R. T	65	M
8) G. Z	66	F
9) T. F	67	M
GROUP 2	Average age 66.4	

In this group, 8 patients (1,2,3,4,5,6,8,9) underwent endoprosthesis surgery while only one subject (7) underwent total hip arthroplasty.[3]

2.4 Outcomes

None of the subjects attended pre-operative physiotherapy, so they all had great difficulty in understanding their condition and in beginning their post-op rehabilitation. The quality of life of a patient is the end result of all rehabilitation activities and coincides with patient satisfaction in his functional complexity. To leave the hospital, being able to move with crutches and to go home, gives great relief to the patient but it makes the patient liable to the risk of dangerous falls at home. For this reason, we focused on three fundamental points:

1) Prevention,
2) Instruction,
3) Self-care.

2.5 The proposed therapy

Home rehabilitation was divided in different phases:

- During the first series of four sessions during the first month of therapy, instructions were given on how to remove architectural barriers in the house, which movements to avoid, how to minimize fluxes manoeuvres, and finally, how to maintain correct posture [4]
- The second four sessions during the second month included the phase of teaching how to ambulate with full weight-bearing, how to walk steadily without limping and with a correct step pattern.
- The last series of four sessions during the third month were based on preventing postural defects, encouraging to repeat home exercises 3 times a day (sitting, standing, prone, supine, lateral position), informing the patient of the Hydrokinesitherapy benefits and encouraging to apply them. [5]

3. ACCOUNTING SYSTEMS

An assessment was made during the first week of the rehabilitation treatment in hospital (T0), upon being discharged from hospital (T1), and at the follow-up visit, at the end of the three months of rehabilitation (T2). As suggested by studies reported in the literature, the following were given: a 'Visual Analogue Scale' (VAS) at T0 / T1 / T2, to analyze the course of the pain [6], the Oswestry Disability Index "(ODI) at T1 / T2 in the version in Italian language (Monticone M. et al. 2009) to measure the level of disability from postural disorders, following the surgery on the hip [7] and at the T1 / T2 a form to investigate the activities that subjects were able to carry out and those where they had major limitations. At the T2 follow-up, the following questionnaire of ten questions was administered to investigate the continuity of home exercises and their effectiveness.[8]

1. In these three months did carry out the proposed exercises at home?
2. How often?
3. If so, have you seen any improvement?
4. If not, why?
5. Have you felt any benefits in your daily activities?
6. Have you followed our advice for the movements to be avoided?
7. Have you identified the exercises that give greater wellbeing? If so, which?
8. Have you tried to maintain a correct posture during these months?
9. Have you overcome the fear of losing your balance when walking without crutches?
10. Do you think you still need to recover in order to perform the ADL normally?

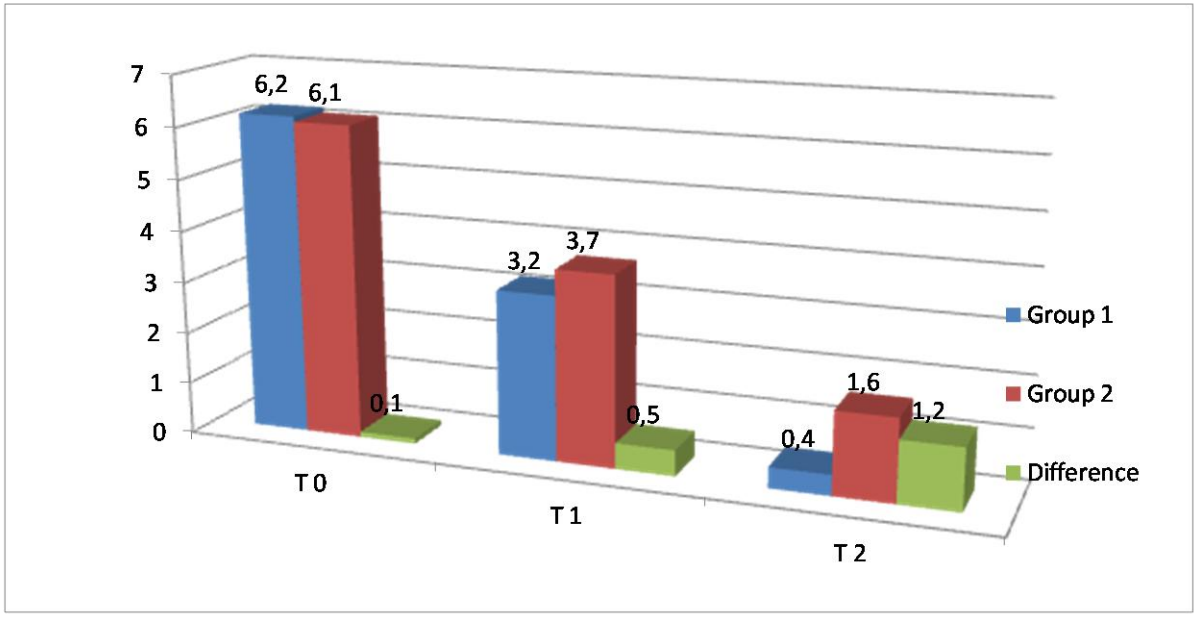
4. RESULTS

On a total of 18 subjects, in the first group (Group 1) those from 1 to 9 underwent the extra weekly home rehabilitation sessions. The second group (Group 2) made of subjects 10 to 18 did not undergo the home sessions. The subjects were identified with numbers as shown in Table 1 for Group 1 and in Table 2 for Group 2.

4.1 Visual Analogic Scale (VAS)

Table 3: Evaluation of the VAS pain performance of the two groups

GROUP 1 / GROUP 2			
Subjects Group1/ Group 2	T0 Group 1/ Group 2	T1 Group 1/ Group 2	T2 Group 1/ Group 2
1 / 10	6 / 6	3 / 4	0 / 1
2 / 11	5 / 7	4 / 3	0 / 0
3 / 12	6 / 6	2 / 4	1 / 1
4 / 13	7 / 6	3 / 3	1 / 2
5 / 14	6 / 7	3 / 6	1 / 3
6 / 15	8 / 5	3 / 3	0 / 2
7 / 16	7 / 6	4 / 4	1 / 2
8 / 17	5 / 6	4 / 3	0 / 2
9 / 18	6 / 6	3 / 4	0 / 2
Median (VAS)	6.2 / 6.1	3.2 / 3.7	0.4 / 1.6



Graph 1: The values and the difference of the VAS scale in three periods

From the results obtained in the times T0 / T1 / T2, one can see that the average T0 time of the Subjects of Group 1 had a pain value of 0.1 greater than Group 2. While in T1 the results changed, Group 2 presented a pain value of 0.5 greater than Group 1. Finally, in T2 we can see that Group 2 had a pain average of 1.2 higher than Group 1.

4.2 Oswestry Disability Index (ODI)

According to the scoring in the T1 and T2 the following statistics have been reported:

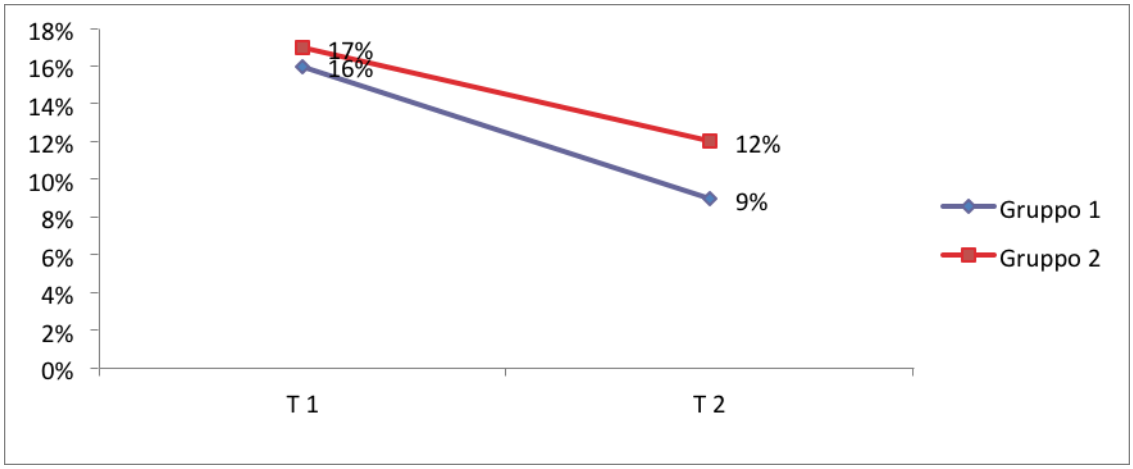
Table 4: Representation of the percentage of Group 1's ODI		
GROUP 1		
Subjects	T1 (First Month)	T2 (Third Month)
1	12 % minimal disability	6 % minimal disability
2	14 % minimal disability	14 % minimal disability
3	10 % minimal disability	4 % minimal disability
4	24 % moderate disability	12 % minimal disability
5	18 % minimal disability	12 % minimal disability
6	10 % minimal disability	10 % minimal disability
7	18 % minimal disability	6 % minimal disability
8	22 % moderate disability	14 % minimal disability
9	16 % minimal disability	6 % minimal disability

Table 5: Representation of the percentage of Group 2's ODI		
GROUP 2		
Subjects	T1 (First Month)	T2 (Third Month)
10	12 % minimal disability	8 % minimal disability
11	16 % minimal disability	6 % minimal disability
12	22 % moderate disability	22 % moderate disability
13	20 % minimal disability	18 % minimal disability
14	24 % moderate disability	22 % moderate disability
15	20 % minimal disability	22 % moderate disability
16	16 % minimal disability	8 % minimal disability
17	14 % minimal disability	4 % minimal disability
18	16 % minimal disability	6 % minimal disability

Table 6: Comparison of the results obtained from the questionnaire to detect the ODI to T1 and T2		
Groups	T1 / Median	T2 / Median
Group 1	16% (10%-22%)	9 % (4%-14%)
Group 2	17 % (12%-24%)	12 % (4%-22%)

As reported in the graph, we can see the effectiveness of adjunctive treatment to Group 1

- At T1time, Group 1 reported an average of 16% until reaching T2 time with a decrease of 7%, reaching 9%.
- At T1time, Group 2 reported an average of 17% until reaching T2 time with a decrease of 5% reaching 12%.



Graph 2: Representation of the percentage difference in T1 / T2 of the two Groups

4.3 Assessment form of the limitations in ADLs

We asked: What limitations do you feel due to hip surgery?[9]

From the individual analysis using the evaluation sheet, we found that: at T2 time of Group 1 no longer feel they have limitations in their daily life, hygiene and personal care, home care, social life or relationships compared to Group 2 where they felt that their limitations had only disappeared when it came to hygiene and personal care.

4.4 Questionnaire

The purpose of the questionnaire was to investigate whether subjects carried out the exercises at home and the advice given. From the answers given, what became clear was that all the subjects in Group 1 executed the exercises at home. Moreover, what became evident was that from the last question only two subjects (4,7) still felt the need to recover. For Group 2, 6 of the subjects (10,13,15,16,17,18) did not carry out the exercises at home. In response to the last question, 6 subjects (10,13,15,16,17,18) still felt the need to recover before they could normally perform their activities of daily living.[10]

5. DISCUSSION

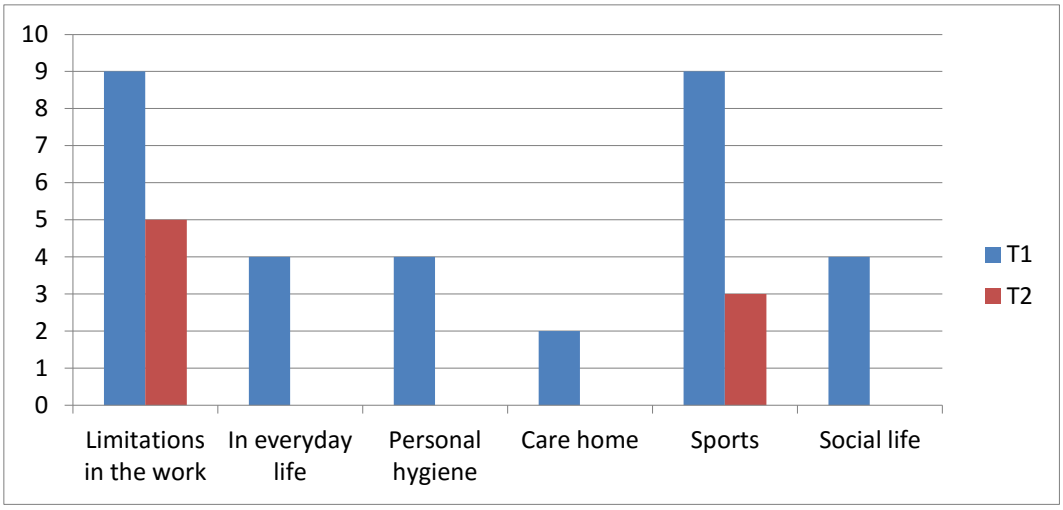
The expectations of the participants in the three times T0 / T1 / T2 were generally as follows:

- To acquire all the information and find the right ways to minimize the pain episodes.
- To avoid behavior that could possibly cause postural defects.
- To locate the exercises that bring benefit by reducing the use of pain medication.
- To carry out all possible activities optimally, at work and in daily life.

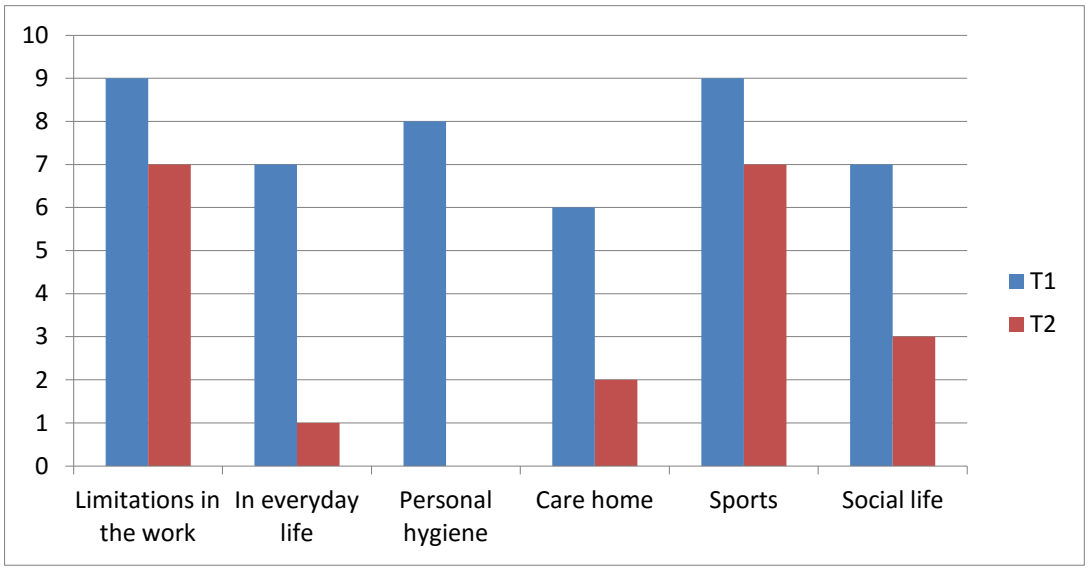
The difficulties to perform the exercises at home, according to the findings from the questionnaires, basically depended on the patient's pain, time and courage. In fact, in a more in-depth analysis with the subjects on the motivations, we found out that the real limit was the lack of a courage stimulus. This project was important in order to enable the patient to become aware of his own body, to listen to it and to understand how to intervene in order to get better, choosing appropriate exercises, adopting a correct posture and prevention strategies, paying attention to the use of his body in all activities, both at work and in daily life. The expectations were met, and some patients even asked to continue and to have other therapy session at their homes.[11]

6. CONCLUSIONS

The importance of performing a consistent physical rehabilitation at home after discharge was understood by all subjects taking part in the study. The purpose of the project was achieved through a multidisciplinary and therapeutic relationship continuity between the hospital and the surrounding areas, through theoretical notions provided to patients about their condition, and counselling from the start of the hip prostheses surgery about its importance [12]. The project aimed to raise body awareness in patients, and to provide information and tools in order to be able to intervene in case of pain and functional limitations. In this regard, a brochure has been put together ad hoc on how to prepare for a return home (how to equip the house or remove barriers, etc.). In adjunctive therapy session at home, systematized practical advice on lifestyle such as maintaining good posture to avoid postural defects and performing the exercises on their own through a process of professional specific counselling have been systemized [13]. So as not to overlook the uniqueness of each person, each patient was individually assessed, which allowed to provide more specific information for each case and the role of secondary prevention, highlighting the most effective strategies and addressing the practical advice for maintaining a satisfactory quality of life. The findings from this study are significant in that they demonstrate that the awareness and listening to one's own body, prevention and implementation of recommended practices have helped to improve the lifestyle of patients and, consequently, their social participation and work, with greater personal satisfaction. Data on the Visual Analogue Scale (VAS) and the Oswestry Disability Index (ODI) have respectively shown an improvement of pain and disability for almost all of the samples. Even the evaluation board of the ADL reported excellent results with almost a disappearance of the limitations in the performance of normal daily life. The following graphs highlight the number of patients who have had limitations in everyday activities at the T1time compared to the T2 time.



Graph 3:GROUP 1

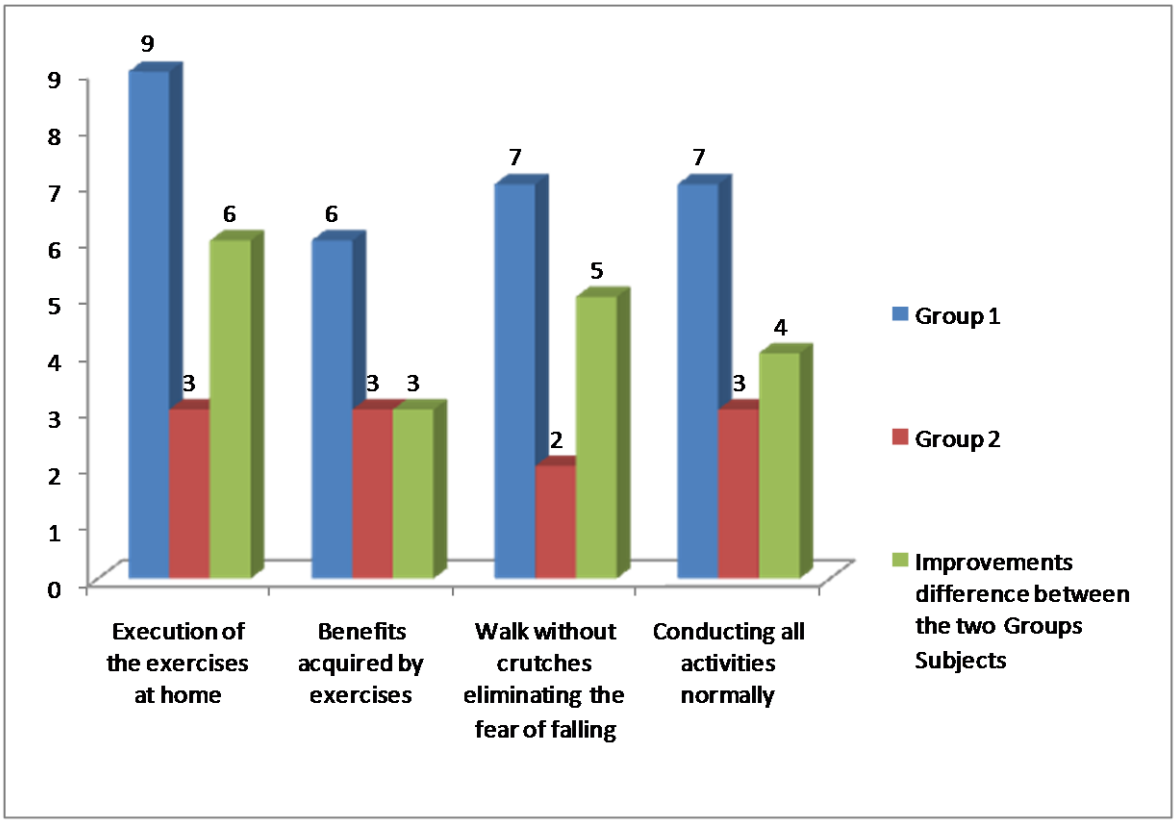


Graph 4: GROUP 2

Equally satisfactory were the results of the 10 - question questionnaire used to investigate the continuity of the exercises at home and their effectiveness.

Table 8: Summarizing the reported results of GROUP 1Subjects at the end of the three months (T2) we notice that
▪ 9 Subjects out of 9 (1/2/3/4/5/6/7/8/9) have carried out the proposed exercises at home
▪ 6 Subjects out of 9 (1/3/5/6/8/9) have felt improvements due to the exercises
▪ 7 Subjects out of (1/3/4/5/6/8/9) have been able to walk without crutches freeing themselves from the fear of falling down
▪ 7 Subjects out of 9 (1/2/3/5/6/8/9) are able to normally carry out all the everyday and work activities

Table 9: Summarizing the reported results of GROUP 2 Subjects at the end of the three months (T2) we notice that
▪ 3 Subjects out of 9 (11/12/14) have carried out the proposed exercises at home
▪ 3 Subjects out of 9 (11//12/14) have felt improvements due to the exercises
▪ 2 Subjects out of (12/16) have been able to walk without crutches freeing themselves from the fear of falling down
▪ 3 Subjects out of 9 (11/12/14) are able to normally carry out all the everyday and work activities



Graph 5: Representation of expectations and improvements of Subjects of both groups reported by the questions from the evaluation questionnaire at the end of the 3 month treatment

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