An online survey of clinical practice of Brazilian physical therapists on rehabilitation following rotator cuff repair

Abstract

Background: Physical therapy is essential to help patients to recover their movements and function following a rotator cuff repair. However, there are uncertainties regarding how long a sling should be used for and when exercises should be started.

Objective: To investigate the current clinical practice of Brazilian physical therapists treating patients who had a rotator cuff repair. We also explored differences between shoulder specialists and non-specialists.

Methods: An online survey with 38 questions, including a clinical case, regarding the physical therapy clinical practice for patients having a rotator cuff repair.

Results: We analyzed 194 responses. Majority of participants were from the Southeast of Brazil (57.5%), had up to 10 years of clinical experience (61.4%) and were not shoulder-specialists (69.8%). Majority of the respondents stated that patients have their first post-operative physical therapy session within the first three weeks (51%). Patients usually use a sling for four to six weeks (60.6%). Passive mobilization is often started in the first-week post-surgery. Fifteen percent of shoulder specialists compared to only six percent of non-shoulder specialists would allow strengthening exercises to start between the first and third weeks post-surgery.

Conclusion: Physical therapists in Brazil seems to follow similar postoperative programs to other countries. Shoulder specialists allow a faster return to activities and start of strengthening exercises.

Keywords: rotator cuff, rehabilitation, survey

1. INTRODUCTION

Physical therapy has been shown to be as effective as surgery to improve pain and function of symptomatic rotator cuff tears.[1] However, some patients do not respond to conservative management and need surgical intervention.[2] The number of rotator cuff repairs are increasing worldwide year-over-year.[3, 4] In Brazil, there was a 238% increase in the numbers of surgeries in the public health service between 2003 and 2015.[5] This substantial increase highlights the burden of rotator cuff tears and the rise on the patient demand for postoperative care.

Surgical techniques to repair rotator cuff tendons have improved over the years, but there are uncertainties regarding postoperative rehabilitation.[6] Currently, rehabilitation following rotator cuff repairs is a topic of great debate. An overview of systematic reviews showed that many systematic reviews and randomised controlled trials have been published in the last 3 years showing conflicting results.[7] The conflicting evidence may affect clinicians' decision-making to establish an effective and safe rehabilitation program. Researchers from different countries have been exploring how physical therapists plan and treat patients after rotator cuff repairs. For instance, Littlewood and Bateman (2015)[8] carried out a survey to detail how physical therapists in the UK were planning their interventions, they concluded that clinicians were somewhat conservative in their approaches. In North America, Mollison, et al. [9] observed great variability in orthopedic surgeons sling prescription and especially on when they would allow the shoulder to be mobilized. In Brazil, Vieira, et al. [10] investigated the opinion of Brazilian surgeons, shoulder specialists and non-specialists, on surgery-related procedures and postoperative rehabilitation. However, the only physical therapy-related question was regarding the average duration of physical therapy prescribed by surgeons before indicating surgery for traumatic or degenerative rotator cuff injuries. The results

of the Brazilian survey regarding rehabilitation are limited. The authors only explored the surgeons' perspective, they did not include physical therapists' opinions, did not explore what exercise modalities are used in the rehabilitation, how tendon loading is progressed or when mobilization is started.

Clinical practice variation may increase the risk of adverse events such as re-tears and stiffness. Given the uncertainties related to rehabilitation following rotator cuff repair and possible variations on postoperative care in Brazil, the aim of our study was to explore and to detail the clinical practice of Brazilian physical therapists who treat patients having a rotator cuff repair. We also had a particular interest in investigating potential differences in management by physical therapists who are specialists in shoulder rehabilitation compared to non-specialist.

2. METHODS

This study was an open, voluntary, online survey reported according to the Checklist for Reporting Results of Internet E-Surveys (CHERRIES).[11] We created the questionnaire based on similar studies from other countries[5, 8, 9] to allow for direct comparisons. After defining the initial questions, the authors discussed the relevance and applicability of each question to be included in the final questionnaire. The final questionnaire had 38 questions (8 on demographics, 16 regarding physical therapists' clinical practice and 14 related to a clinical case) (Supplementary material A). The questions were distributed across 32 screens/pages (minimum of 1 and maximum of 7 questions per screen/page). The first screen/page of the questionnaire was an informed consent form where the participant had general information about the study and its objectives. Participants could only continue to the main questionnaire if they gave their

consent on the first page. Questions and closed-ended answers followed the same order for all participants. The questionnaire was open for responses from November 2017 to February 2018. The study received ethical approval (75573717.7.0000.5108).

Some of the clinical questions were answered based on a clinical case. The clinical case was described as the following:

"A 59-year old man presents to you at the 3rd postoperative day following a rotator cuff repair due to a medium full-thickness tear (between 1 to 3 cm) that affected the supraspinatus and infraspinatus. The surgeon describes the repair as stable (tension-free). Acromioplasty was also performed. No complications are reported. The patient works as a business administrator and enjoys playing tennis in the weekends."

The clinical questions on the survey were about timing for progressing to different exercise modalities (passive, active-assisted, active, strengthening and proprioception) and timing to return to activities such as driving, light activities (e.g. office work, washing dishes), demanding activities requiring carrying loads (e.g. manual labor), non-contact and contact sports. The questionnaire was written in Brazilian Portuguese and was applied, recorded and stored using the online tool Google Forms. We did not randomize the order of the questions or answers for each question. Before submitting their final answers, participants had the opportunity to review and/or changes their answers by clicking on the returning button. We identified duplicates by checking email addresses that were entered more than once. If a duplication was identified, the first entry would be maintained. Only the research team had access to the list of email addresses, which was password protected. No IP addresses were recorded.

2.1. Eligibility criteria

The eligibility criteria consisted of physical therapists who were registered in Brazil and involved with the care of patients having a rotator cuff repair. We did not offer any incentives to participants to participate or complete the survey. We offered to send the results of the questionnaire to those who confirmed their interested in receiving them. Participants also had the option of saving a copy of their responses for their records.

2.2. Sampling

It is estimated that there are approximately 206,170 physical therapists registered in Brazil.[12] However, it is difficult to estimate the proportion of professionals who are involved with the rehabilitation of patients with shoulder problems. Thus, we used convenience sampling. The invitation to complete the survey was disseminated through social media (Facebook and Twitter) and emails to personal contacts of the authors to physical therapists who were potentially involved with shoulder rehabilitation. The messages sent by email to potential participants would contain the link to the questionnaire, no responses were recorded by email replies to the authors. No invitations were sent by standard post. A copy of the text used on social media is available in the Supplementary material B. We checked for questionnaire completeness once the data collection period ended and all entries had been submitted.

2.3. Data Analysis

The data was exported to Excel 2016 (Microsoft Corp. Redmond, WA, USA) and descriptive analysis was undertaken. No statistical method to adjust for non-representative sample was applied nor was the time taken to complete the questionnaire recorded. We included partial and complete responses in the analysis, the missingness for

each question was reported accordingly. The categorization of participants as shoulder specialist or non-shoulder specialist was based on their self-definition.

3. RESULTS

3.1. Response rates

During 14 weeks 196 entries were received. After checking for duplicates and responses of physical therapist who were not practitioners in Brazil, a final total of 194 surveys were analyzed.

3.2. Clinical practice characteristics

The majority of the respondents were from the Southeast (57.5%) and South (30.4%) of Brazil, had up to 10 years of clinical experience (61.4%), worked in the private sector (76.8%) and were not shoulder rehabilitation specialists (69.8%) (Table 1).

Table 1.

Regarding their clinical practice, most physical therapists reported treating less than 20 rotator cuff repairs patients per year (77.3%). One-third of the physical therapists reported that patients have conservative treatment preoperatively (physical therapy only: 50.8%; physical therapy combined with injections: 49.2%). Majority of the respondents stated that patients' first postoperative physical therapy session is scheduled for the first three weeks (51%), and the sling is most often discarded between 4 to 6 weeks postoperatively (60.6%). Fifty-eight percent of the respondents reported a frequency of face-to-face sessions of twice a week and 95.4% prescribed home exercises, mainly to be performed every day (66.7%) (Table 2).

Table 2.

The results related to the clinical case are detailed in Figures 1 (exercise progression) and 2 (return to activities). They are presented according to shoulder specialists (n=58) and non-specialists' (n=134) responses. Overall, a similar pattern could be observed for exercise progression for both groups of professionals. Majority of physical therapists in both groups, although a greater proportion was observed for shoulder specialists (50 vs 38.8%), stated that passive mobilization would commence in the first week. Shoulder specialists were less conservative regarding strengthening exercises, with 15.5% stating that strengthening would start after the first week compared to 6% in the non-specialist group. However, the timing to start strengthening exercises varied and there was a lack of consensus in both groups. In relation to proprioceptive exercises, a lack of consensus was also observed. One in four physical therapists, shoulder specialist or non-specialist, would start proprioceptive exercises after 7-8 weeks postoperatively and almost one in three physical therapists would start at 9-12 weeks postoperatively.

Figure 1.

The non-specialist group was more cautious to allow patients to return to their routine activities. The majority permitted returning to driving only at 9-12 weeks; in contrast to 7-8 weeks in the shoulder specialist group. Similarly, 50% of shoulder specialists would allow patients at 4-6 weeks to return to light activities, in comparison to 33.6% in the non-specialist group. Returning to demanding activities, non-contact-sports and contact sports had similar frequency distribution between groups.

Figure 2.

4. DISCUSSION

The aim of our survey was to describe the clinical management of rotator cuff repairs by Brazilian physical therapists. Due to limitations of the online tool used, we could not

record the number of unique visitors. Therefore, we could not calculate view, participation and completion rates. The results from our study for sling usage were similar to those found in the UK,[8] New Zealand [13] and reflect the findings from Vieira, et al. [10] that 67% of shoulder surgeons recommend an immobilization period of 3 to 6 weeks. Although it is common practice to use a sling for 6 weeks after surgery, there is no high-quality evidence to support this decision.[7]

Overall, compared to other studies, we found similar results regarding the timing to start and progress exercises. However, we found considerable variation in the responses for the timing to start passive exercises, progression to strengthening exercises and return to light activities.[8, 9] The majority of physical therapists, regardless of being a shoulder specialist or not, responded that they would start passive exercises within threes week from surgery, progress to active-assisted exercises at 4-6 weeks and move to active exercises at 7-8 weeks. The progression timeline found in our study was similar to two other countries, New Zealand and North America.[9, 13] In New Zealand, the majority of the protocols would allow passive exercises in the first week and active exercises at 6-8 weeks.[13] In North America, passive exercise starts within two weeks from surgery and active exercises at 7-10 weeks.[9] In contrast, the survey from Littlewood, et al. [8] showed that in the UK, passive exercises are started in the first three weeks postoperatively, but the progression to active exercises is faster, starting at 4-6 weeks.

We found discrepancies on the timing to start strengthening exercises. Twenty percent of physical therapists in Brazil reported that they would allow strengthening exercises at 4-6 weeks. One in four physical therapists would allow strengthening to commence only at 9-12 weeks. Considering our findings and those from other studies, it seems that there is a lack of consensus for the timing to progress to strengthening/resisted exercises. In the

UK, North America and New Zealand resisted exercise has been reported to start at 7-12 weeks, 6-12 weeks and after 12 weeks, respectively.[8-10]

The timing to return to activities showed conflicting results between specialists (4-6 weeks) and non-specialists (7-8 weeks) in Brazil. Compared to other studies, the non-specialist group in Brazil responded similarly to the majority of British physical therapists (48%), who would indicate returning to light activities at 7-12 weeks.[8] In New Zealand and North America, the timing to return to light activities is delayed until 12-16 weeks.[9, 13] The studies from New Zealand and North America did not use a clinical case for participants to make a decision, which may the reason for the different timelines to return to light activities.[9, 13] The results for returning to more demanding activities were similar in Brazil and the UK; patients are allowed to return around 13 weeks postoperatively. In New Zealand returning to activities requiring load-carrying would be avoided until six months postoperatively;[13] no data was available from North America.[9]

There was consensus between groups in our study on the timing to return to non-contact (after 13 weeks) and contact sports (after 16 weeks), which is in agreement to the UK survey.[8] In New Zealand, the protocols advise returning to sports between 3 to 9 months postoperatively.[13]

Based on randomised controlled trials, it is challenging to determine the optimal timing to progress exercise modalities. The majority of the studies lack methodological rigor. Their interventions and intervention development are not reported in full as recommended by the template for intervention description and replication (TIDieR) checklist and guide.[14] In light of new evidence on rehabilitation following rotator cuff repairs suggesting that rehabilitation can be more permissive in the early stages,[15, 16] new guidelines are needed to support and inform physical therapists for a better clinical decision-making when treating this patient population. However, further high-quality

randomised controlled trials are ongoing and their results will be beneficial in developing guidelines,[17, 18] although the adaptation and applicability of these trials to the Brazilian context may need support from future studies in Brazil as well.

4.1. Limitations

We did not record the number of views, participation, and completion rates. The data from our survey was based mostly on physical therapists working privately and from the Southeast and South areas. Although these are the Brazilian regions with the highest population density, our data may be limited in representing clinical practice in the whole country and the public health sector. Our sample had a limited number of physical therapists who would consider themselves as shoulder specialists, therefore, the results may have been different if a higher number of specialists had responded to the survey. Another limitation is related to the text used to describe some of the questions of our questionnaire. Based on the feedback of some of the participants, they felt that more information and better description should be provided for our definition of proprioceptive exercises. Another comment was that we should have specified in the question "what patients do you consider that early mobilization is allowed?" that the early mobilization was for the glenohumeral joint. Some physical therapists responded that they would allow early mobilization of the scapula but would avoid glenohumeral movements in the first weeks following surgery.

5. CONCLUSION

Brazilian physical therapists seem to follow a similar rehabilitation program to those reported in other countries. Patients having a rotator cuff repair use a sling for about six

weeks postoperatively. Passive ROM is started within three weeks from surgery for patients with a stable rotator cuff repair of a medium tear. There is a lack of consensus regarding returning to light activities and non-contact sport; shoulder specialists allow a faster return to activities and start of strengthening exercises than non-specialist physical therapists.

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Table 1. Respondents' characteristics.

Variable	Frequency n (%)
Age (years)	**n=194**
21-25	17 (8.8)
26-30	58 (29.9)
31-35	45 (23.2)
36-40	43 (22.2)
41-45	22 (11.3)
46-50	5 (2.6)
Older than 50	4 (2.1)
Missing	0 (0)
Sex	**n=194**
Male	100 (51.5)
Female	94 (48.5)
Missing	0 (0)
Geographical area in Brazil	**n=194**
North	4 (2)
Northeast	9 (4.7)
Midwest	10 (5.2)
South	59 (30.4)
Southeast	112 (57.7)
Missing	0 (0)
Years of Practice	**n=194**
Less than 5 years	49 (25.3)
Between 5 to 10 years	70 (36.1)
Between 11 to 15 years	37 (19.1)
Between 16 to 20 years	20 (10.3)
More than 20 years	18 (9.3)
Missing	0 (0)

Work Sector	**n=194**
Public	19 (9.8)
Private	149 (76.8)
Public and Private	26 (13.4)
Missing	0 (0)
Specialist on shoulder rehabilitation	**n=194**
Yes	58 (29.9)
No	134 (69.1)
Missing	2 (1.0)

Table 2. Clinical practice characteristics.

Variable	Frequency n (%)
Number of patients with rotator cuff repairs treated per year	**n=194**
Less than 20	150 (77.3)
More than 20	44 (22.7)
Missing	0 (0)
Do patients undergo preoperative treatment?	**n=194**
Yes	59 (30.4)
No	114 (58.8)
I don't know	21 (10.8)
Missing	0 (0)
Type of preoperative treatment	**n=59**
Physical therapy	30 (50.8)
Physical therapy + injections	29 (49.2)
Missing	0 (0)
Goals of preoperative physical therapy treatment	**n=59**
Avoid surgery	23 (39)
Improve postop recovery	34 (58)
Both	2 (3)
Missing	0 (0)
Number of physical therapy sessions before patient deciding for surgery	**n=194**
Less than 3	22 (11.3)
Between 4 to 10	33 (17.0)
More than 10	103 (53.1)
Missing	36 (18.6)
Timing of patients' first outpatient session postoperatively	**n=194**
Up to 3 weeks	99 (51.1)

Between 4 to 6 weeks	79 (40.7)
After 6 weeks	16 (8.2)
Missing	0 (0)
Use of immobilization device after surgery	**n=194**
Yes	156 (80.4)
No	38 (19.6)
Missing	0 (0)
Type of immobilization device	**n=156**
Sling	110 (70.5)
Sling + abduction component	43 (27.6)
Other	3 (1.9)
Missing	0 (0)

Continue

Table 2 (continue). Clinical practice characteristics.

Variable	**Frequency n (%)**
Average time patients use a sling for	**n=194**
Less than a week	2 (1.0)
Between 1 to 3 weeks	50 (25.8)
Between 4 to 6 weeks	94 (48.5)
Between 7 to 8 weeks	9 (4.6)
Missing	39 (20.1)
Most common surgical method seen in clinical practice	**n=194**
Arthroscopy	169 (87.1)
Semi-open	14 (7.2)
Open	11 (5.7)
Missing	0 (0)

Frequency of face-to-face physical therapy sessions after surgery	**n=194**
Daily	42 (21.6)
Three times a week	34 (17.5)
Twice a week	113 (58.2)
Once a week	2 (1)
Once a month	3 (1.5)
Missing	0 (0)
Prescription of home exercises after surgery	**n=194**
Yes	185 (95.4)
No	9 (4.6)
Missing	0 (0)
Frequency of home exercises	**n=185**
Everyday	122 (65.9)
Alternated with face-to-face appointment	61 (33.0)
Missing	2 (1.1)
For what size of rotator cuff tear/repair do you use early rehabilitation?	**n=194**
Any size, with surgeon approval	144 (74.2)
Small only (<1 cm)	13 (6.7)
Small (<1 cm) and medium (1 to 3 cm)	20 (10.3)
None	5 (2.6)
Any size	1 (0.5)
Missing	11 (5.7)

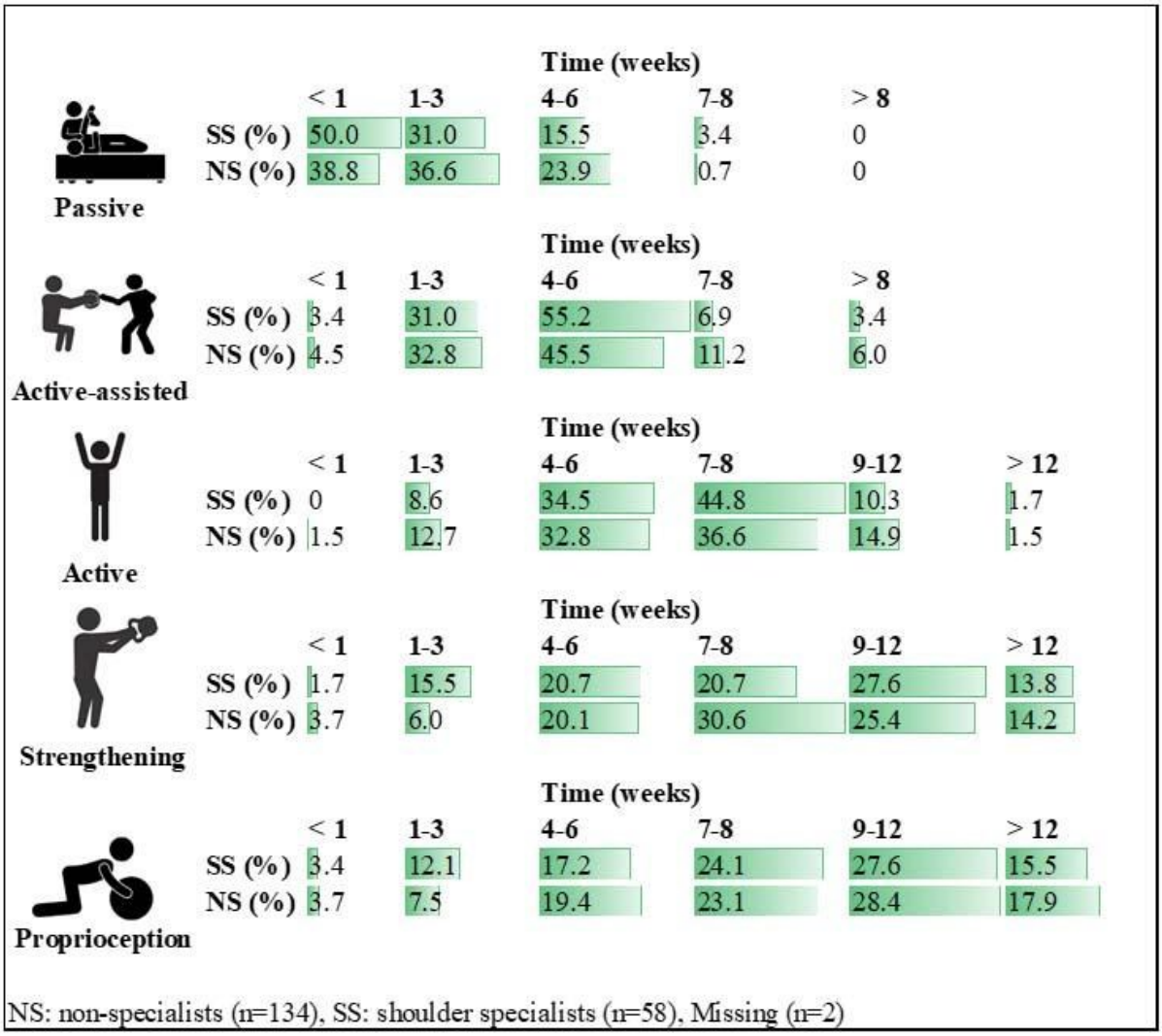

Figure 1. Exercise progression by shoulder specialists and non-specialists.

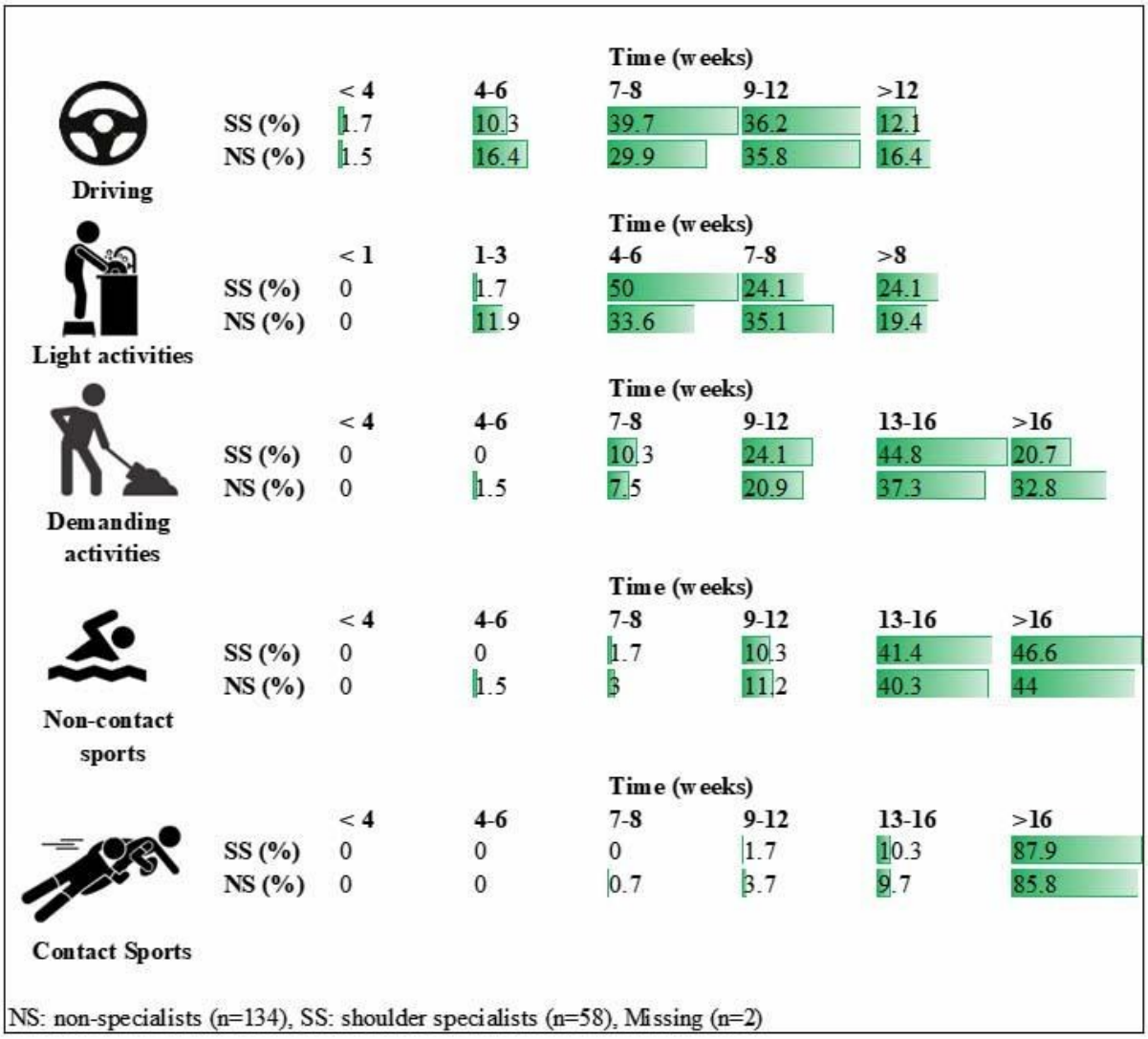

Figure 2. Timing of returning to activities by shoulder specialists and non-specialists