Received: 23 March 2023 | Revised: 9 January 2024 | Accepted: 18 January 2024

DOI: 10.1002/ejp.2246

EJP European Journal of Pain

ORIGINAL ARTICLE

Beyond activity patterns: The complex process of activity management among individuals with chronic musculoskeletal pain after an orthopaedic trauma

J. Mbarga[1] | **C. Favre**[2] | **C. Ribeiro**[1] | **C. Pichonnaz**[3] | **C. Ancey**[3] | **R.-A. Foley**[1] | **B. Leger**[4] | **F. Luthi**[5,6]

[1]Department of Applied Research and Development, HESAV School of Health Sciences – HES-SO University of Applied Sciences and Arts Western Switzerland, Lausanne, Switzerland

[2]Department of Psychosomatic, Clinique Romande de Réadaptation, Sion, Switzerland

[3]Department of Physiotherapy, HESAV School of Health Sciences – HES-SO University of Applied Sciences and Arts Western Switzerland, Lausanne, Switzerland

[4]Institute for Research in Rehabilitation, Clinique Romande de Réadaptation, Sion, Switzerland

[5]Department of Musculoskeletal Rehabilitation and Institute for Research in Rehabilitation, Clinique Romande de Réadaptation, Sion, Switzerland

[6]Division of Physical Medicine and Rehabilitation, Lausanne University Hospital, Lausanne, Switzerland

Correspondence
J. Mbarga, Department of Applied Research and Development, HESAV School of Health Sciences – HES-SO University of Applied Sciences and Arts Western Switzerland, Avenue de Beaumont 21, CH 1011, Lausanne, Switzerland.
Email: josiane.mbarga@hesav.ch

Abstract

Context: Individuals must change the way they perform activities in response to chronic pain. In the literature, three activity patterns are commonly described: avoidance, pacing, and persistence. Many studies have explored these activity patterns. However, little research has delved into the factors that lead people to adopt a particular activity behaviour. This study aimed to explore the relationship that people with chronic musculoskeletal pain have with activity and highlight the factors underlying their practices.

Methods: The qualitative study was conducted by researchers in the social sciences, physiotherapy, psychology, and rehabilitation medicine. Observations of vocational workshops and semi-structured interviews were conducted with 33 persons undergoing rehabilitation for chronic musculoskeletal pain after an accident.

Results: Patients' declarations and actions show that any one patient will alternate between activity patterns: the same person may adopt a strategy of avoidance, pacing or persistence depending on the context, the importance of the activity, personal objectives, and representations of self, pain, and activity. The decision to engage in a particular behaviour is based on a process of self-negotiation weighted by the circumstances, the nature of the activity, the importance attached to it, and the individual's perceived ability.

Conclusion: Our study emphasized the complexity of physical, social, and contextual factors that intervene in the relationship toward activity. Rather than favouring pacing, the therapist's role in rehabilitation might be to reinforce the reflexive process and the patient's adaptability in approaching the activity, to foster the capacity to find flexible solutions.

Significance: Patients choose an activity pattern (avoidance, pacing, persistence) according to the challenges they face in their daily lives. Context, representations of self and activity, as well as goals sought influence these choices. Some patients

report having learned to adapt their activity management strategies. Therefore, therapeutic approaches in the rehabilitation context could focus on these adaptive capacities to offer patients optimal pain and activity management and develop their ability to use different strategies according to the circumstance.

1 | INTRODUCTION

Chronic pain has numerous consequences on the ability to perform daily activities (work, domestic activities, leisure, social activities, etc.). There is a growing interest in understanding how people adapt to these changes in their relationship to activity. Three main patterns of activity have been described: avoidance, pacing, and persistence, the latter also called endurance or overdoing (Andrews et al., 2012; Vlaeyen et al., 2016; Vlaeyen & Linton, 2012).

The fear-avoidance model and the avoidance-endurance model have been extensively studied (Hasenbring et al., 2020; Vlaeyen & Linton, 2012). The first emphasizes fear of injury, catastrophizing, and anxiety to explain avoidance and then perpetuation of pain. The second describes distraction and thought suppression/minimization as cognitive mechanisms that aim to suppress the perception of pain. This model may induce an overload of the musculoskeletal structures and a rebound of the pain, especially in association with a depressed mood (Distress-Endurance Response). However, regarding pacing, considered an ideal behaviour to deal with chronic pain and activity (Murphy & Kratz, 2014), there is no universally accepted definition. Although Nielson et al. described pacing as "a regulation of activity level/or rate in the service of an adaptive goal" (Nielson et al., 2013), other authors found a positive relationship between pacing and disability (McCracken & Samuel, 2007) or a form of "hidden avoidance" when the use of pacing is more "pain-contingent" than "task-contingent" (Kindermans et al., 2011; Luthi et al., 2018). Still others have proposed improving our understanding of activity patterns by a varied combination of avoidance, pacing, and persistence (Cane et al., 2016); Esteve et al., 2017; Kindermans et al., 2011).

However, the factors influencing the activation of this or that behaviour in the face of pain remains widely debated. To better understand them, different models have been proposed. One is the model of psychological flexibility, which emphasizes the role of personal goals and values as well as of psychological flexibility in the pursuit of an activity (McCracken & Morley, 2014), or the self-discrepancies model, which provides explanations of the activity behaviour as a protection of self-identity or as a resolution of pain-induced discrepancies (Esteve et al., 2017; Kindermans et al., 2011; Van Damme & Kindermans, 2015).

The quantitative research on activity patterns sheds light on how individuals deal with pain. However, the relationships of people with pain during activity are likely much more complex than the usual questionnaire-based approaches suggest. Quantitative studies also do not allow for a deeper understanding of the patient's perspective. Therefore, qualitative approaches focusing on subjective experience can provide valuable additional information (Glenton, 2003; Lillrank, 2003). In persistent pain, qualitative studies have so far mainly focused on the experience of living with pain (Telbizova & Arnaoudova, 2020, Tutelman & Webster, 2020). However, a few qualitative studies have focused more specifically on patterns, in particular overactivity and pacing (Andrews et al., 2015; Antcliff et al., 2016; Scott-Dempster et al., 2017). They emphasized that although difficult to change, pacing can be learned through dedicated interventions.

This qualitative study aimed to explore the relationship with activity for people with chronic musculoskeletal pain after a musculoskeletal trauma and highlight the dynamics between the factors underlying their engagement in one or another pattern. This study should bring to light the meaning attributed to such practices and the factors underlying their activity behaviours during rehabilitation and in their life context.

2 | CONTEXT AND METHODS

2.1 | Context

This study involved people with persistent pain and functional limitations after an orthopaedic trauma who were participating in a rehabilitation program at a rehabilitation clinic in French-speaking Switzerland. Patients were included in an inpatient rehabilitation program.

The aim of the program was to manage the pain and to improve function, activity, and participation, including a return to work (usual or adapted), using a multidisciplinary biopsychosocial approach according to the recommended practice for patients with chronic pain (Kamper et al., 2015). Indeed, this program included a psychological component with four sessions of cognitive-behavioural therapy, social advice, and vocational training as well as physical components including physical and occupational therapy. Representing 80% of the proposed therapies, the

latter were organized in individual and group sessions offered to participants, with graded exercises focusing on strength and endurance training, stretching, balance, walking, and adapted physical activities.

At the beginning of the rehabilitation stay, patients' functional abilities were assessed. All patients took part in two pain therapeutic education sessions called "Move smartly" and received a leaflet entitled "My rehabilitation journey: I'm in pain and I'm moving," which summarizes the key messages related to pain and activity management. Then, for each patient, a program with objectives focused on graded activity with pacing strategies was developed. These objectives were regularly adjusted during individual therapies and weekly multidisciplinary meetings. For patients for whom avoidance was specifically identified, graded exposure was preferred.

The length of rehabilitation stay was 4–5 weeks with 3–4 h of daily therapy (excluding weekends). Because the program had a vocational component with work training, patients participated in 2–4 h of vocational workshops targeting activities related to their problems in the second or third week (Figure 1).

The vocational workshop helped patients assess and train in different vocational activities (mechanics, construction, computing, etc.). These activities consisted, for example, of setting up and demonstrating a false ceiling, cutting and sanding wood, and creating hanging files.

2.2 | Design

This qualitative and longitudinal study analysed the relationship with activity for patients with pain and its explanatory logic. The problem arose from the existing literature relating to the behaviours that characterize patterns and the factors that underpin them (Andrews et al., 2015; Cane et al., 2016; Hasenbring et al., 2012; Van Damme & Kindermans, 2015; Vlaeyen et al., 2016; Vlaeyen & Linton, 2012). Then, objectives, research questions, and hypotheses that could influence the relationship to the activity were defined and helped define the categories to be analysed. These were further refined during the analysis of the initial field data. To answer questions raised, two methods were used: observations in vocational workshops and semi-structured interviews at two key moments of the program (during and after) (Figure 2).

Interview and observation guides were developed by an interdisciplinary team. As is common in qualitative research (Beaud & Weber, 2010; Maxwell & Earle Reybold, 2015), these were not fixed but were flexible insofar as they adapted to the situation of each patient. Consequently, the categories that seemed relevant for analysis were generated on a Mindmap before conducting observations and interviews, but certain themes emerged also from the analyses of the first interviews.

The workshop observations investigated the patients' behaviours such as task management strategies, signs of activity patterns, and physical and verbal expressions during activities depending on the characteristics of the workshops (environment, type, and objectives of the proposed activities). At the end of the workshop, patients were asked to participate in a semi-structured interview.

The semi-structured interviews investigated the patients' representations and practices, accident trajectory, experiences, and expectations towards the rehabilitation program as well as socio-demographic data. The combination of the two methods allowed for cross-referencing the two datasets to highlight the coherence between perceived

FIGURE 1 Vocational Workshop (welding workshop).

and performed activity and to collect information on the execution of activities.

The study was approved by the ethics commission (CER-VD 2017–00962) and performed by an interdisciplinary team consisting of a health sociologist, two health anthropologists, two physiotherapists experienced in the musculoskeletal field, a rehabilitation psychologist, and a physician specialized in rehabilitation. The Consolidated Criteria for Reporting Qualitative Research (COREQ) (Tong et al., 2007) were used to report the research.

2.3 | Participants

The participants were all involved in a rehabilitation program. We included patients between March 2018 and November 2019 by using a purposive sampling method. At admission, all patients completed a validated French version of the Patterns of Activity Measure-Pain (POAM-P) questionnaire (Benaim et al., 2017). To enrol equal proportions of patients with a predominant avoidant, pacing, or persistent activity profile, participants were screened with use of the questionnaire. To determine the preferred activity profile, we used the median of the three POAM-P patterns according to the method proposed by Huijnen et al. (2011). Depending on whether the score was above the median for one scale and below for the other two, activity profiles were classified as preferentially avoidant, modulating, or persistent. To have a median calculated on a large sample of comparable patients, we used the results of a previous quantitative study (Luthi et al., 2018).

The selection of patients and disseminating information about the study involved medical doctors outside the research team to avoid interpretation bias on the part of the investigators. The identity of patients who had confirmed their participation by signing the consent form was then communicated to the investigators, who were masked to their POAM-P score until the end of the analyses to avoid being influenced by its results. A total of 33 patients were included, according to the criteria of Table 1. However, only 24 patients agreed to the second interview. The others withdrew for various reasons: lack of interest, unavailability, or a desire to forget the accident.

In the qualitative study, the priority is to understand subjective experiences as well as the meaning attributed to them. The focus is on in-depth analysis of data collected from a selected sample to identify the factors that shape the unique patient experience in a given situation, rather than on measuring phenomena or quantifying behaviours. Qualitative research is then often performed with small samples but has the objective of identifying, by analysing and grouping information, meaningful regularities (Berk et al., 2015; Paillé & Mucchielli, 2012). For example, some research on the management of chronic pain was performed with samples of about 20 people or less but have provided a detailed description and offered a detailed understanding of the pain and activity management strategies used by patients as well as their expectations toward therapists (Andrews et al., 2015; Antcliff et al., 2016; Scott-Dempster et al., 2017). Accordingly, in this study, a purposive sample size of 33 patients seemed in line with common practice in qualitative research. This number was not sufficient to fully reflect the diversity of patients' experiences, but it allowed for meeting the study objectives and ensured sufficient variability of situations (Savoie-Zajc, 2006). The data saturation cannot be formally demonstrated (Vasileiou et al., 2018). Nevertheless, the results of the study, which highlight the richness and

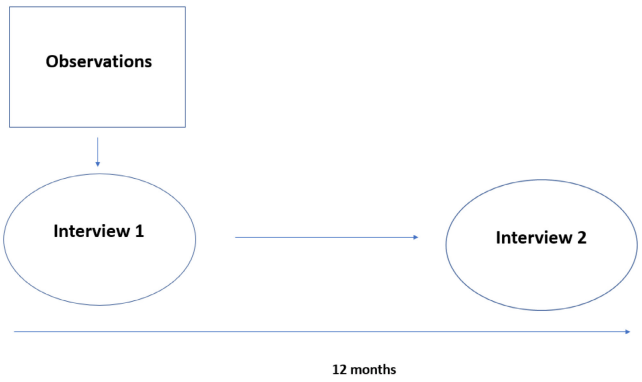

FIGURE 2 Schematic design of the study.

TABLE 1 Inclusion and exclusion criteria.

Inclusion criteria	Exclusion criteria
Men and women over 18 years of age Minor to moderate orthopaedic trauma	Major neurological problems (plexus, head trauma, spinal cord injury, polytrauma, amputation)
People able to express themselves orally in French (local language); with or without professional activity	Moderate to severe depression, personality disorder, including borderline and psychotic disorders, somatoform pain disorders
Patients who agreed to participate: 33	
Patients who refused to participate: 1	
Patients who dropped out at the second interview: 9	

TABLE 2 Characteristics of the population.

Sex (♂;♀)	6; 27 ($n = 33$)
Age (years)	44.9 ± 10.6, min. 19; max. 63.5
Temporality of the accident at the first interview	($n = 33$)
1–3 years	29
>4 years	4
Employment status at first interview	($n = 33$)
Unemployed before the accident	4
Total interruption of activity and dismissed after the accident	15
Total interruption of activity, with a work contract	7
Employed, part-time	7
Marital status	($n = 33$)
Married	16
Separated	2
Divorced	9
Single	6
Training	($n = 33$)
No education	2
High school level	29
Higher education	2
Brief Pain Inventory: severity subscale (0–10) [mean (SD)]	4.6 (1.8)
Number of patients per pattern	Avoidance 11 Pacing 12 Overdoing 10
Trauma location [%]	Back 18.2 Upper limb 36.4 Lower limb 45.4
Days between trauma and hospitalization [median (interquartile range)]	372.5 (265.5; 594.5)
POAM-P score (0–40) [mean (SD)]	Avoidance 25.6 (10.0) Pacing 24.4 (10.4) Overdoing 21.4 (8.9)

diversity of the patients' experiences, show that this sample size was adequate to explore the phenomenon under study (Vasileiou et al., 2018). The study sample was compared with the population under care ($n = 590$) during the study period, and no significant differences were found (socio-demographic variables, injury location, interval between injury and rehabilitation, pain intensity, POAM-P scores). The sample characteristics are summarized in Table 2.

2.4 | Data collection procedure

To perform the fieldwork, it seemed appropriate to entrust the data collection to the members of the team trained in qualitative research. Introducing two researchers during the vocational workshop could have disrupted the course of the workshop because the patients would have felt intensely observed. Therefore, attendance at the workshops was limited to one person. Hence, the professional workshop observations and the interviews were conducted by the health sociologist. She introduced herself, presented the objectives of the study, and reassured the participants of the confidentiality of the data before beginning the observation. Patients were informed that the data collected would be confidential and would only be shared among team members.

Prior to the main study, an exploratory phase was carried out (from September 2017 to October 2017) to refine the observation and interview guides as well as the data analysis procedure. This phase consisted in workshop observations and face-to-face interviews of

three patients (one patient per pattern), as determined by the POAM-P. After these initial exploratory observations and interviews, each team member analysed the data collected. Then, meetings were organized to produce common and interdisciplinary analyses. The latter allowed for redefining the observation and interview guides, which had been previously developed. They also allowed for consolidating the themes to be highlighted in the main study.

For the observations, during the workshop, the sociologist conducted non-participant observations (Williams, 2008) of 2-h activities during the patients' second or third week of rehabilitation. That is, she attended these activities without participating and without interacting with the participants during the workshop. The observations were not filmed because it would have been difficult to observe in detail, from a distance, the patients' bodily expressions and compensatory behaviours. The observer took notes throughout the workshop that were shared with all team members and focused on task assigned (time, gestures performed, amount of weight, etc.), reactions and body expression, interruptions, pauses, hesitations, compensations and adaptations, control of movements, breathing, avoidance of gestures, and achievement of objectives. An illustration is given in Table 3.

The workshops observed targeted activities related to the specific problems of each patient, and these were chosen according to their relevance to them. During the observation, the impact of the observer's presence was not noticeable because the patients performed the activities without distraction. During the interview, the patients admitted that they continued the activity despite the pain and difficulties they felt because they did not want to disappoint the socio-professional trainers or prejudice the data collection and the study. This situation suggests the Hawthorne effect (McCambridge et al., 2014): when individuals feel observed or when they are tested, they tend to improve their productivity. Indeed, during the vocational workshops and during their rehabilitation stay in general, patients were more inclined to comply with and carry out the tasks assigned to them or perhaps they hoped to achieve the recovery goals. By way of illustration, Jean (first names used in the manuscript are fictitious) affirmed that at home, he had the choice to do less and was more sedentary, but at the clinic, he adopted an attitude of conformity: "*I do what I am asked to do*". Also, Mick said that he was more involved in the activities at the clinic because he would like to improve his physical condition. During interviews, patients explicitly linked their behaviour during the workshop and their behaviour at work in terms of the constraints of carrying out the tasks assigned, although they acknowledged that the situations in the two contexts were not entirely equivalent.

The interviews aimed to bring out the patients' relationship to activity, the strategies used, and the factors that influenced them, by referring to the activities carried out during the workshop and then by extension in daily life. We conducted comprehensive interviews (Kaufmann, 2011) that allow the interviewees to testify about their practice and lived experience. Two semi-structured interviews were conducted a year apart, based on previously described guides. They were all audio-recorded and fully transcribed.

All the interviews were conducted in French, the local language. Therefore, the verbatim used in this article were translated into English. We are aware of the interpretation biases involved in translating content from a source language to a target language and have endeavoured to retain the meaning and tone of the original text.

The first 60- to 90-min interview took place immediately after the observation in a designated room at the clinic. It focused on the activities observed during the workshop, activity management, and strategies for carrying out activities (in daily life and in the workshop), circumstances and perceived consequences of the accident, biographical and therapeutic background, experience and expectations of the rehabilitation program, and perception of the future. The 30- to 60-min second interview took place 1 year later by telephone. The objective of this second interview was to analyse the patient's experience after rehabilitation, to see what patients said they had learned from rehabilitation, and if the relationship to activity had changed.

This interview focused on the patient's trajectory (therapeutic, personal, and professional) since rehabilitation, the perceived effects of the program, the application of acquired skills, and changes in activity management.

2.5 | Data analysis

The interviews were transcribed and anonymized by assigning a number to each patient. Data analysis was based on qualitative thematic analysis (Braun & Clarke, 2021; Paillé & Mucchielli, 2012) using content analysis software (MaxQDA 2018, then MaxQDA 2020), based on themes and codes predefined during the exploratory phase, in relation to the research objectives and questions, and completed during the main study. The interviews were previously coded by the sociologist, then reviewed and complemented by four other team members: a medical anthropologist, two physiotherapists, and a psychologist. The analyses were divided

TABLE 3 Examples of the activities performed by one participant during the observation of the vocational workshop.

Patient characteristics: Male, 40 years old, professional situation: Unemployed; profession before accident: Bricklayer on building sites and waiter; date of the accident: July 13, 2017 (work accident); type of injury: Patella dislocation, osteochondral fracture of the right knee and a near complete tear of the medial patellofemoral ligament	
Activity 1; Construction of a metal frame on the ground Activity goal: to encourage knee movement; continue to assess the patient and see how the patient copes with pain.	
Task assigned time, gestures performed, amount of weight	Assembly and disassembly of the metal frame in 1 h The metal frame consisted of 10 metal bars. The patient must move to get the bars, one by one. The bars are located about 5 m from the place where the frame was to be built. Then the frame had to be assembled on the ground and fixed with 12 brackets and screwed with bolts, washers, and nuts. Once the frame was assembled, the patient must dismantle it, which means that the movements are carried out in the opposite direction. To perform the activity, the patient must adopt positions/gestures such as squatting, kneeling, weight bearing and walking.
Reactions and body expression	No specific facial expressions were noted
Interruptions, pauses, hesitations	During the time the activity was performed, the patient did not take any breaks. He seemed hesitant when he had to interpret the metal frame figure to be reproduced.
Compensations and adaptations, control of movements	He chose to pick up all the metal bars that were in the rack and placed them on the floor. He picked up two metal bars at a time, instead of one at a time as specified by the socio-professional master. When he moved, he limped and when he had to put the bars on the floor, he bent his left leg, while the right one remained straight. The patient placed all the bars on the floor in the direction shown in the picture of the metal frame. Once all the pieces were on the floor and arranged as shown in the picture, the patient took all the brackets from the storage box and placed them in the places where they were to be screwed in. The patient distributed the brackets to the various places where they were to be attached without ever bending the knee of the right leg. He practically worked standing up, or when he had to bend down, he bent the left knee and kept the right one extended. When all the parts were in place, the patient sat on the floor and started to screw all the parts together. He remained in this position until the end of the assembly of the metal frame and the beginning of the disassembly (unscrewing the parts). He only got up when he had to put the parts away in the storage bins.
Breathing	Deep breathing
Avoidance of gestures	The patient never kneeled. He reduced the movements by taking several metal bars at a time. He performed most of the activity sitting on the floor.
Achievement of objectives	The activity was carried out in the allotted time (about 1 h) and the metal frame was assembled and disassembled without any mistakes.
Activity 2; Moving and laying paving stones on the ground Activity goal: to encourage walking with weight-bearing, assess the patient's behaviour and resistance to weight bearing and walking with weights, and see how the patient coped with pain.	
Task assigned time, gestures performed, amount of weight	The activity had no time limit. The patient was free to choose when to stop it. This patient performed it for about 15 min. The frequency of the activity was variable: the patient had to go outside, take the wheelbarrow, fill it with paving stones, come back inside and put the paving stones on the ground. The distance between outside and inside was approximately 30 m. The patient had to fill the wheelbarrow with a weight that was comfortable for him. The weight of each paver depended on the humidity. They could weigh between 2 and 3 kilos.
Reactions and body expression	The patient made 4 trips to load the wheelbarrow and return to put the paving stones on the ground. From the first to the last trip, he filled the wheelbarrow a few times less (13 paving stones, 7 paving stones, 6 paving stones and 6 paving stones). His momentum and strength decreased during the trips, and he became slower and slower. The patient was sweating profusely and fatigue was evident on his face.

(Continues)

TABLE 3 (Continued)

Interruptions, pauses, hesitations	Between the third and fourth trip, the patient needed a break. On arriving inside on the fourth trip, the patient sat down for a while.
Compensations and adaptations, control of movements	The patient had a limp, walked slowly, and when he had to put the paving stones on the ground, he stood with his right leg extended.
Breathing	His breathing was very heavy, and he was sweating a lot.
Avoidance of gestures	He never bent the right knee and compensated with the left side.
Achievement of objectives	The patient made the effort to try the activity, which involved carrying weights and moving around a lot. But when the trainer asked him how he was doing and if he wanted to continue the activity, the patient preferred to stop it because his back, left leg and right knee were very sore and he felt very tired.

equally between the two physiotherapists and two social scientists, each analysing all the themes for half of the sample. After combining their views, and after the first interdisciplinary syntheses, the themes for the rest of the sample were analysed by two interdisciplinary pairs, including a physiotherapist and a social scientist. In a third step, the psychologist analysed all the data, and this analysis was integrated with the previous ones. In a final phase, all the analyses were discussed by all investigators to produce transversal analyses and syntheses. The observation notes were shared with the entire research team for disciplinary and interdisciplinary analyses and were used to supplement the information gathered during the interviews. Finally, these analyses were linked to the sociodemographic characteristics of the patients and to the results of the POAM-P.

Although this article is primarily based on data collected during interviews, observation notes were continually used by researchers to compare verbatim to what was observed and to provide additional information in the text.

3 | RESULTS

In a first set of results, we describe the characteristics related to each pattern separately before analysing, in a second set of results how they were intertwined and permeable and how they evolved with time in a longitudinal perspective.

3.1 | Relationships to activity

All the activity patterns were mobilized by all participants, to varying degrees and depending on the context. In addition to the aspects investigated in the POAM-P, patients reported deciding to undertake an activity by considering factors detailed below for each pattern.

3.1.1 | Characteristics of avoidance

As expected, the main reason for avoidance was the recurrent reference to pain and limitations as well as the reduction of activities. Patients spoke of invasive, pervasive pain, and all avoided some activities because of it. For example, Marc expressed how the pain eventually got the upper hand on some occasions: "*I want to, but then if we... even if you feel like it, the pain takes over... it always wins.*" Pain was often seen unescapable: "*I'm trying not to be in pain actually*," Mick said. Fear of movement or of worsening and catastrophizing was also mentioned as hindering the realization of certain activities. Aline avoided riding or performing activities with a risk of falling and Mick declared, "*An outing with colleagues in... things like that, I don't go out because if something happens, how can I run? how can I...*"

To explain their avoidance behaviour, most patients described their bodies as fragile and damaged due to the recurrence of pain or limitations following the accident. Indeed, beyond the pain, participants evoked several damaged aspects of their body that can hinder the performance of the activities: fractures, settlements, tears, muscular deconditioning, blocking, and damaged nerves were elements mobilized to highlight their feeling. Boniface said that his body, in the past, could be pushed to the limit and now, it imposes limits on him: "*it is weak, less tonic, painful*". In addition to the temporary or permanent interruption of professional activity, patients also gave up leisure activities, sports, or daily tasks involving the carrying of heavy loads although they tried to maintain basic activities (cooking, grooming, housekeeping, and childcare). Two patients stated outright that they had given up all activity. Jean said, "*I just walk around (...) I can't do anything anymore. I can't tinker anymore. (...) It's TV, fridge, sleep. That's what I do*". These statements seem absolute, without any nuance. They reflect an all-or-nothing thinking "either I can do everything, or I can do nothing,", a cognitive distortion

that is common in pain patients and in depressive patients, who face losses that are difficult to accept (Beck et al., 1979; Clark et al., 1999). Nevertheless, as the interview progressed, Jean's speech, like that of other patients, became more nuanced overall, as he listed various activities or tasks in which he was involved.

Some participants reported avoidance strategies related to fear of social judgement. Fear of the scrutiny of others (third parties or employer) or even of the control of the insurance (on the activities carried out during the work stoppage) led them not to do the activities: "*I was in pain anyway, but … I would have liked to do a little bit of work at home. But I didn't dare anymore because of the way others looked at me*." (Marc). "*Moving around, it's better. But you say that to an employer, he says 'ah well if you move, it's better, you can come to work*.'" (Christophe).

The loss of desire and pleasure, the sense of decreased competence, the feeling of powerlessness, and the difficulty of confronting one's limitations have also been reported: Boniface said "*Well, there's a loss of taste and a loss of power to continue my projects (…) I had a lot of projects to do to be able to tinker at home. But now I've dropped everything, because I know I'm not going to make it. I don't want to do things that I know I won't succeed in*." Norbert added, "*Now, there are things that I can do with my left hand, I do. But there are things that I know I'm not going to make it, so, I don't*."

Finally, the possibility of delegating certain tasks to relatives was also mentioned as leading to avoidance: "*If I have someone next to me, I say, 'Look, do this for me, because I can't do it.' (…). For a 5-minute thing, it's not worth damaging me even more*." (Etienne).

3.1.2 | Characteristics of persistence

Globally, persistence was underlined by respondents by referring to both intrinsic (i.e., related to the person) and extrinsic factors (i.e., related to social environment, external to the person) (see Table 4).

Patients regularly referred to their strong character and their life rules to explain persistent behaviours. Ben stated, "*I had so much pain, but I did it because I'm stubborn*." Emmanuel referred to himself as "*hard headed*" and Aaron referred to himself as "*stubborn*". Life rules were illustrated by phrases as "*it must," "I must," "I have to be active," "I have to finish what has been started," "I have to do it quickly*." These rules can also be read as internalized constraints that lead them to not give up on activities until the goal is achieved, with the risk of overwork and exacerbation of the pain.

Patients sometimes adopted persistence in a targeted way. Some used it to carry out a precise task, to reinforce their capacities or with the aim of improving their condition: "*I used to be able to hold on for 30 seconds, but then you look for 40 seconds and then you look for 50 or 45 and you go step by step until you improve your dexterity (…). I don't want to give up any activity, even if it hurts, uh… "* (Eddy). Lara resorted to this to obtain recognition of her condition, legitimization of her pain and better therapeutic management: "*I have to force it; I have to make it burst! (…) After a while I was so fed up that nobody listened to me, I said to myself, 'If I force it, it's going to blow up and then maybe they'll finally do something*.'" (Lara).

3.1.3 | Characteristics of pacing

All patients reported using pacing strategies at times to manage their activities. Various known aspects of pacing have emerged from their discourses: listening to the body and its limits, alternating activities, compensation strategies, alternating postures and positions, alternating periods of activity and rest, fragmentating activities and lengthening the time needed to perform a task, reducing intensity, and rhythm. Some of these aspects were also observed during the vocational workshops and included changing positions and postures, alternating tasks and using compensation strategies (i.e., relying more on a painless body part to preserve the injured area). Some patients reorganized the environment, sometimes explicitly bypassing the instructions. For example, Mick, who had to move around the workshop several times to look for parts, decided to take all the parts at once to prevent moving around the workstation so that he could sit on the floor and avoid getting up. Patients changed their strategies based on the characteristics of the activities, the perceived degree of difficulty, and the anticipated impact on pathology and pain.

During the interviews, pacing was presented by patients as a reflective action that required planning and anticipation. They emphasized the importance of thinking before acting to evaluate the task to be accomplished, and act smartly: "*There is a kind of… well, how are we going to do this? Here, we do a little assessment before… Can I do it? How am I going to do it? (…) Finally, for each new thing I'm going to do (…) each time, I study before, to know how I can. It's not instinctive anymore*." (Simon) "*I do things totally intelligently. I have to think about everything I do… I can't just go headfirst anymore (….) I've had to relearn how to make smart moves*." (Daniel).

The observations also highlighted this reflective process, underpinned by a pronounced risk assessment in

TABLE 4 Factors underlying persistence.

Intrinsic factors (number of people)	Extrinsic factors (number of people)
Relativisation of the pain (13): "We take the pain upon ourselves and then we go, and then, well, we are in pain but never mind". (Marc). *Belief that doing the activity will lead to less pain (4)*: "even if I have pain, I don't care. I will do everything I can to try not to hurt anymore" (Simon). *Representations of having good pains (2)*: "I went beyond because I felt good pains (aches)" (Aline). *Appreciation of the benefits of activity (11)*: "I know that inactivity, it's not good. So the fact that you're getting back into shape, reconditioning yourself, well that... that helps" (Aline). *Focus on finishing the task (16)*: "It's the will to be able to finish without stopping" (Joseph). *Appreciation of the result (12)*: "The pleasure in fact is not to do it, it is to succeed" (Simon). *Satisfaction with the task accomplished, pleasure in reaching an objective (7)*: "In the evening, I can't walk anymore. (...) I am dead, but I am happy with the day" (Marc). *Self-representations and rules of life (18)*: "I want to get to the end (...) I have a temperament: when I start, I finish. But, in everything. Anything. If I start an activity, I don't leave it hanging" (Bertrand). "I finish what I do (...) it is again in my nature. I like to finish things (...) I need to get things done. It's very important for me. And to see the result" (Aaron). *Willingness to increase one's capacities (7)*: "Each time I have limits that are pushed a little further and it really makes me feel good" (Daniel). "I couldn't get the plates, now I can, with a little effort I can" (Ben). *Willingness to return to normality (12)*: "I need to be able to work again, to live a bit correctly, to have a bit of a normal life" (Lara).	*Assuming one's social role (17)*: 1. Assuming one's role as a parent (11): "Taking care of the children in fact. I must, I can't do anything else. I can't stay in bed and let them manage" (Gilles). 2. Contribute to household chores (shared with spouse) (6): "I think that everything that is the maintenance of the household in any case... We share the tasks with my friend, but then... Since I was off work, I thought I should do a little more, than when he arrives in the evening, and he still must help me clean or whatever" (Eliane). *Fear of disappointing one's employer (5)*: "I am obliged to continue the activity (...) Because I do not want to disappoint my employer. They give me this job; it must be done as soon as possible (Jeanne). *Work demands (4)*: (pace, doing one's job in a team): 'Well I grit my teeth. I must work, so I do everything I can (...) At home, it's fine. But at work it's... time, it's very limited to do everything" (Eliane). *Willingness to perform the tasks required in a rehabilitation context (all)*: "The activity lasts 20 min. In those 20 min, I have to prove myself. I'm going to do everything I can to try to do as much as possible, because I don't want people to associate my result with the fact that I'm sick, or that I have this problem" (Jane). *Willingness to show a good image of oneself (7)* 1. *Refusal to be considered and categorized as disabled (3)*: "I didn't want people to say that I am disabled (...) I wanted to do everything to say no but I am not disabled. Just because I can't move this hand doesn't mean I can't do things" (Simon). 2. *Willingness to hide limitations (4)*: "I don't like people, the public, to see me limping or something like that. So, it makes it more painful, that's for sure. But I don't like to show it" (Emmanuel).

some patients. For example, Daniel thought before any movement, prevented sudden movements, and did not force. Simon evaluated first the weight, the danger and the load of the parts to be used. During the interview, he mentioned using a danger scale of his own to evaluate the risks according to criteria such as the weight or the sharpness of the tool. According to many patients, pacing involved a phase of learning and experimentation, constantly resorting to new tricks, and finding ways to do things differently. They noted the importance of resourcefulness, inventiveness, and personal strategies in finding solutions to function at the highest possible level, shared their inventiveness during the interviews and claimed to have found different personalized tricks to function. For example, Emmanuel put his foot more forward when pedalling. Alain would wet a cloth and press hard with his good hand to open a jar of jam and Mick performed most activities sitting on the floor to preserve his knee. Some reported that the learning process took time because each activity required testing several adaptations.

3.2 | The relationship to activity in movement: The coexistence of the different patterns

The three patterns of activity coexisted to varying degrees in all participants. The same patient could adopt a strategy of avoidance, pacing or persistence depending on the circumstances, the importance attributed to the activity, and its anticipated consequences.

Engagement in an activity was associated with its context: private, professional, or rehabilitation. In the private sphere, the patients differentiated between the unavoidable activities and those that could be done at will. Although they tended to persist in essential activities of daily life and in household needs (cleaning, cooking,

shopping, taking the children to school, body maintenance), they were more likely to stop leisure activities. They favoured using pacing, because they could manage the pace of the activity, carry out only the tasks they felt capable of doing, and adjust tasks according to pain.

In the professional context, the activity was evoked as a mission that must be accomplished. Consequently, several patients forced themselves to complete their task despite pain. Several constraints, related to persistence, were also mentioned: dealing with the scrutiny of others, meeting the employer's requirements, managing time pressure, being a reliable employee: "*At home, it's fine. But at work it's... a question of time, it's very limited to do each thing (...) I can't stop (...) because otherwise I don't finish (...). So we can't take a break. We have to finish in time*." (Eliane) Therefore, at work, participants were more likely to persist unless some flexibility was granted.

In the context of rehabilitation, many patients felt engaged in the activities because of the rewarding aspect of progress, the desire to achieve personal goals or a desire to comply. For example, John stated that he was not very active at home but followed the guidelines in rehabilitation: "*I do what I am told*." Observations of the workshops revealed this strong tendency to persist during rehabilitation: all participants showed a commitment to the tasks assigned despite difficulties and limitations. To explain this, during the interviews, some patients emphasized that they wanted to comply, and others stated that they wanted to prove their ability. Still others stated that the shorter duration of the activity motivated them to become involved. All perceived that the tasks performed in the workshop were simpler and easier than those at work.

Patients' engagement was also related to their representation of activity. Some reported a negative perception of the activity, related to its anticipated consequences. Eddy thought that pain was relieved by "inaction" and John that the gain from rest "*had been demolished*" due to pain during rehabilitation. Conversely, other patients put forward a positive representation of activity related to its beneficial effects (i.e., getting the body loosened up, reconditioning, and moving forward). Christophe reported the positive effects of exercise, and Ginette considered sport as a safety valve *("I need it; I love it")*. A positive representation of activity was also associated with the negative effects of inactivity: Aline said that "*inactivity is not good*" (because it induces a certain deconditioning) and Marc affirmed, "*the body woke up in me. That means that it was sleeping, and now it has woken up*." Some linked their engagement in activity to their self-image, strong character, tendency to push or involvement in sport or their sense of usefulness in society.

Commitment to an activity was also motivated by having pleasure, managing daily life, assuming social roles, preserving a sense of purpose, and needing to return to normality, explained in Table 5.

3.3 | Evolution of the 12-month relationship to activity

At the time of the second interview, apart from Albert, who stated that his pain had been resolved, all patients reported persistent pain, which they tried to manage as best they could in order to perform activities. Thus, the coexistence of the three activity patterns in each patient was also found in the patients' discourse at 1 year after the rehabilitation program. As in the first interviews, patients reported pain, limitations, fear of injury, or aggravation as reasons to avoid activities. Low mood, depression, feelings of helplessness, unsuccessful experiences, or deteriorated health status were more frequently reported in those with an avoidance profile.

As in the first interview, patients with a predominantly persistent profile described themselves as go-getters, persevering and tenacious. However, all patients could adopt a persistent attitude on some occasions depending on the circumstance, typically in situations of external constraints: work (rhythm, doing one's task in a team), life context (raising one's child, contributing to household and family tasks, maintaining one's living environment), or social pressure (preserving one's external image). Wanting to achieve a desired outcome, returning to meaningful activities, and controlling pain were also cited as reasons for the tendency to persist. In the light of experience, some recognized that persistence helped improve their situation, whereas others pointed out its limitations, such as exacerbation of pain, hindrance to progress, and the risk of a "yo-yo" effect: Bertrand stated that "*there are repercussions behind it*," and Emmanuel said that "*it has done more harm than good*." In this way, the rehabilitation program sometimes helped to reduce persistence. With this in mind, Bertrand said he was trying to adapt how he managed his activities. Before, he would persevere and thought he had to go for it even if he could not. One year on from the program, he said he thought he must go for it but that he had to adapt to the problems he has and adapt the way he does things. Like him, Désiré reported a complete change in his management of the activity in the sense that, before, nothing scared him, he just went for it. After the program, he did not go for it as much, he said. The program enabled him to abandon certain old habits: "*I voluntarily put the brakes on a lot of things. Today, it comes almost mechanically. Suddenly, I'm going to decide ah, I'm not going to do that, whereas before, I'd say to myself, 'It doesn't matter. I don't care, I'll do it and if it hurts for three days, it hurts for three days*.'" (Désiré).

TABLE 5 Summarize of factors underlying patient's relationship to activity.

Factor	Description
Daily management	Important for *all* patients, managing daily life was for some a necessity for preserving independence and self-image. 11 patients saw it more as an ability to control their environment (Keep it clean) and to be able to take care of themselves.
Assuming social roles	17 patients said that they performed activities out of obligation to fulfil their social roles: e.g., caring for and entertaining children, doing household chores when their partner was working. Some ($n=6$) also associated this role with their identity and self-image.
Preserving a sense of purpose	5 patients said they had resumed household and maintenance tasks (e.g., gardening) to keep themselves busy and useful, after a phase of social isolation due to the accident.
Pleasure	7 patients often associated pleasure with identity-related activities (motorcycle, sports, etc.), which act as an outlet for the frustrations resulting from their disability and pain. 13 patients considered pleasure as a motivator to do the activity or as an indication that they were regaining control over their body and improving their physical condition. The absence of pleasure was often a source of avoidance for 3 patients.
Need to return to normality, to recover	For 12 patients, motivation to perform an activity was sometimes associated with the goal of recovery and getting back to the way things were, progressing and achieving "normality".
Wellness and health	Being active, in this case in sports, was a passion for 8 patients and seemed to be essential for the well-being it provides, for keeping in shape physically and psychologically, and for exceeding one's limits.
Means to relieve pain	5 patients stated that they did activities for the relief it brings: for example, gardening for Etienne and cycling for Simon.
Self-evaluation of one's abilities	4 patients reported performing activities in order to test and evaluate their functional abilities and associated pain levels.

In pacing situations, patients reported in the second interview the strategies already mentioned. In addition, some patients reported that they did fewer activities to focus on essential ones (e.g., Emmanuel focused on his learning and left other activities aside), whereas others said that they put more importance in listening to one's body, respecting one's limits and trying not to hurt oneself. Several patients noted that the slower pace and breaks made activities take much longer, which was a problem in the workplace. Thus, pacing remained more commonly used in the private sphere. The patients emphasized that pacing could be learned and required both experience and knowledge of how one's body will react. Parallel to the solutions patients found on their own and during the therapeutic trajectory, the learning and management tools acquired during rehabilitation or during the therapeutic trajectory were mentioned as useful resources.

Several patients stressed that it was important not to exceed the bearable threshold of pain and to avoid its exacerbation. Some used previous experiences and the knowledge acquired during rehabilitation to adapt to their limitations and do things differently. Others, who described themselves as go-getters, said that they had learned to refrain, even though it was difficult.

4 | DISCUSSION

4.1 | Coexistence of the three activity patterns: Avoidance, pacing, and persistence

Previous research has highlighted that although individuals generally have one predominant pattern, they also mobilize the other two moderately or weakly (Hasenbring et al., 2012; Huijnen et al., 2011). Our results are in line with this finding and strongly emphasize that the three activity patterns are jointly present in all patients. Although the qualitative approach used cannot measure the degree of variation in the use of different patterns or demonstrate their flexibility, the data suggest that the same person may avoid, pace, or persist depending on the circumstance. The context of the activity seems an essential weighting factor for the importance given to an activity. The connection between the observations and the patients' discourse in this research shed light on this issue that has been marginally addressed in past research.

In the private sphere, there is a strong tendency to avoid non-essential activities and to adapt or persist essential ones. Pacing is deployed mainly in this sphere, marked by flexibility and the search for life balance, although it can

possibly be mobilized in the professional context when there is room to manoeuvre. In the workplace, people are more inclined to persist to be productive. In the rehabilitation context, the safe environment, the presence of health professionals, and the sharing of experiences with peers lead many people to persist. In addition, showing a willingness to do well and conform are common denominators for all patients. In this aspect, they tend to persist to take on the role of "good patients" ready to become involved to improve (Parsons, 1951), showing diligence and commitment in carrying out the prescribed task.

Many other factors underlying patients' relationship to activity are considered: the importance of the activity, representations of pain and activity, representations of self, life rules, pleasure, a desire to preserve one's self-image and a sense of usefulness, and a desire to meet goals, professional and social requirements. Other authors have shown that chronic pain interferes with competing goals in daily activities (Corbin & Strauss, 1992; Esteve et al., 2017; Vlaeyen et al., 2016; Vlaeyen & Linton, 2012). The adoption of a pattern for achieving these goals despite pain is underpinned by both individual characteristics (psychic, identity, affective, motivational, and coping skills) (Esteve et al., 2017; Kindermans et al., 2011) and the value and priority given to a goal, which can overcome pain avoidance (Claes et al., 2014; Claes et al., 2015; Esteve et al., 2017; Van Damme & Kindermans, 2015). Thus, a person inclined to avoid may adopt another activity behaviour in case of perceived necessity. This research highlights the fluctuating and adaptive relationship towards activities (Esteve et al., 2017), although some patients with a predominantly persistent activity pattern may find modifying their relationship to activity difficult, as demonstrated in the literature. Indeed, in this study, as in Andrews et al. (2015), people's premorbid personalities stand out particularly in persistence situations and can be a barrier to changing activity-related behaviours. However, in this research, as in Andrews et al. (2015) and in their pain management program, some patients were able to learn to put some pacing strategies into practice during and after our multidisciplinary rehabilitation program, owing to its focus on pain and activity management. Indeed, some patients reported that they adapted their persistent behaviours by becoming more pacers, according to the program's achievements.

4.2 | Negotiated construction of the relationship to the activity

The relationship to the activity fluctuates according to a process of constant negotiation with oneself. Inspired by the "negotiated order" model, which reveals the active role of the patient in their care (Adam & Herzlich, 2009; Baszanger, 1986; Corbin & Strauss, 1992), our analysis showed that to engage or not in an activity, patients adopt some sort of compromise. They negotiate with themselves by prioritizing their activities (basic needs vs non-essential activities) but also by considering their pain, limitations, resources, constraints, goals, and values. Other mechanisms may also play a role in this negotiation process, such as the commitment to personal values (as stressed in the psychological flexibility model and in the self-regulation model) or the resolution of pain-induced discrepancies, as explained in the self-discrepancy model (Claes et al., 2015; Esteve et al., 2017; Van Damme & Kindermans, 2015).

In contrast, patients negotiate with others: health professionals, relatives, health and social welfare system (accident, unemployment and disability insurance, and social services). The biographical and therapeutic trajectory as well as the professional trajectory after the accident are weighting factors in this ongoing negotiation. Because these trajectories are not linear, the negotiation process fluctuates according to the stages patients go through.

4.3 | Activity patterns revisited

In avoidance situations, the body is seen by patients as fragile and damaged so that it can no longer perform its function as a tool (Boltanski, 1971). Therefore, avoidance concerns not only the threat associated with pain (Crombez et al., 2012; Vlaeyen et al., 2016; Vlaeyen & Linton, 2012) but also the perceived need to protect or even overprotect a weakened body. The patient demographics may partly strengthen the perception of a certain fragility of the body. Most of our patients had orthopaedic injuries (e.g., fractures, sprains). Furthermore, most of the participants were working in physically demanding occupations (blue collar). Considering their body as affected in its instrumental and functional dimension (Boltanski, 1971), they were reluctant to continue doing the same occupations in order to protect their body. Avoidance could also preserve one's self-image by preventing the potential confrontation with failure. Furthermore, fear of the judgement can lead to avoid activities: some people, while off work, renounce activities to avoid being seen as "taking advantage of the system" or even malingerers who could be reported to insurance companies. Therefore, used as a protective strategy, avoidance is linked to other types of fear, different from the fear of pain (Crombez et al., 2012; Vlaeyen et al., 2016; Vlaeyen & Linton, 2012).

Regarding persistence, this research, like Andrews et al. (2015), highlighted strong links to self-representations. In situations of persistence, patients often see themselves as strong, even stubborn, with high

personal rules and demands. More subtly, discourse and practices of some patients illustrate a form of intelligent persistence (Esteve et al., 2017; Kindermans et al., 2011) that combines the evaluation of one's abilities, perseverance, and the purposeful search for effective strategies to achieve the goal. Conversely, maladaptive persistence (Andrews et al., 2015) is characterized by a "die-hard" temper, rigid life rules, and self-esteem protection mechanisms that can induce pain exacerbation.

For pacing, patients reported multiple strategies already identified in the literature (Andrews et al., 2012; Andrews et al., 2015; Antcliff et al., 2016; Cane et al., 2016; Esteve et al., 2017; Hasenbring & Verbunt, 2010; Nielson et al., 2014; Vlaeyen & Linton, 2012): fragmentation of tasks, alteration of activities and positions, compensating, resting, decreasing pace and intensity, etc. Most of these strategies emerged from a combination of patients' experience and lay knowledge, often predating the rehabilitation program, with many patients with a pacer's profile considering themselves resourceful and having high self-efficacy. Pacing appears to result from a reflective attitude, a process of continuous learning and experimentation that allows for accomplishing an activity. However, clearly delineating the boundary between pacing and avoidance seems difficult because various strategies to limit pain and physical stress may be close to a subtle form of avoidance (McCracken & Samuel, 2007).

4.4 | Perspectives

From a clinical perspective, pacing is the most recommended activity management strategy for chronic musculoskeletal pain in clinical settings (Andrews et al., 2015; Cane et al., 2016; Hasenbring et al., 2020; Hasenbring & Verbunt, 2010; Huijnen et al., 2011; Vlaeyen & Linton, 2012). Yet, the pacing recommendations are not always applicable in real-life contexts (Andrews et al., 2015; Cane et al., 2016), especially in a professional context. In fact, the data suggest, as did Antcliff et al. (2016), that constraints associated with the work environment can act as a barrier to the implementation of pacing. Indeed, when people are at work, they make an effort to carry out their tasks as they should, within the allotted time. Therefore, applying pacing strategies is difficult, whatever the sector of activity. This may also be true in other contexts such as family life. Knowing that attitudes towards activity are not inherently adaptive or maladaptive but rather depend on the goals and intentions behind them (Van Damme & Kindermans, 2015; Volders et al., 2015), therapeutic rehabilitation approaches could be optimized by educating patients to be more flexible and adaptive and encouraging them to adopt a form of persistence oriented to well-defined, valued, and attainable goals, without rigidity or overdoing, or task realization-oriented pacing without excessive pain control. The results of this research are in line with some previous research showing that the competing goals in daily life influence involvement in activities (Crombez et al., 2012; Esteve et al., 2017; Vlaeyen & Linton, 2012; Vlaeyen et al., 2016). This finding suggests a certain adaptability in people's relationship to activity, although this result should be confirmed by further studies. Patients could be trained to adopt flexible approaches focused on the development of a range of skills and activity management strategies that should be mobilized in a targeted manner adapted to circumstances. This training might be possible by adopting patient-centred approaches (Andrews, 2023; Antcliff et al., 2016; Birkholtz et al., 2004; Scott-Dempster et al., 2017). The latter approaches highlight assessment strategies and therapeutic approaches that can enable individuals to increase their participation in activities they need or want to do. In this process, semi-structured interviews and the use of the Role Checklist version 3, which contains items for assessing aspects relating to routine, people's satisfaction with their performance and the factors hindering the performance of activities (Scott et al., 2017), seem to be the preferred methods. The subjective experience would be better captured by people's narration of their daily routine and would provide a clearer picture of the activities performed, the context associated with them (self-care, household chores and house maintenance, work, study and volunteering, leisure and social activities), and the regularity with which these activities are performed. Also, therapists working from an acceptance and commitment therapy approach model will also promote a flexible behaviour consistent with personal values (McCracken & Morley, 2014).

From a research perspective, the questionnaires used to explore the relationship to activity often make little reference to the context in which the activities are performed. An analysis, such as a systematic review, using questionnaires from different contexts could result in diluting rather than improving knowledge. For example, the POAM-P overdoing subscale may be associated with opposite outcomes depending on whether it is practiced in a "pain clinic multimodal program" (Cane et al., 2013), in a rehabilitation setting more oriented to return to work (Luthi et al., 2018) or in the community (Kindermans et al., 2011), as developed by Luthi et al. (2018). For a clearer specification of the context (domestic activity, leisure, work, etc.) in the questionnaire items could allow for a finer analysis of the patterns used and help determine the degree of adaptivity to circumstances. To this end, a column could be added to the questionnaires, allowing

respondents to specify the context in which their activities are carried out (domestic work, leisure, and professional activity).

For future qualitative research, saturation parameters, choice of sample size, as well as inter-observer and inter-rater reliability should be considered more to improve the transparent study-specific reporting (McCarthy et al., 2021; Vasileiou et al., 2018).

4.5 | Strengths and limitations

This research provided useful data for understanding the relationship to activity of patients recovering from an orthopaedic trauma. The results are based on a relatively large sample for a qualitative study, which is representative of the rehabilitation-setting population, with patients who were in an evolving situation because they had persistent pain for relatively less time (1–2 years after an accident) than those considered in other studies. This sample was sufficient to illustrate a consistent variety of patient situations that are encountered in rehabilitation, although a less frequent situation may not have been investigated in this study. Although the study provided innovative information on the complexity of the activity behaviours of patients in this transitional phase who are sometimes professionally integrated, the results do not apply to the entire population of people with chronic pain. Furthermore, our results, based on self-reported discourses and practices with two cross-sectional interviews, imply that our conclusions are not definitive, cannot establish a dynamic overtime, and need to be confirmed by further studies with more systematic observation of people's behaviour in different life contexts. Another limitation was that at the follow-up, we assessed the presence or absence of pain but not its intensity. Additionally, we cannot consider that the observations from professional workshops during rehabilitation are completely transposable to real professional contexts. Finally, the use of videos during the observation could have provided more precise information.

5 | CONCLUSIONS

This qualitative research combined non-participant observations of activities during vocational workshops and semi-directive interviews to investigate in-depth the process that leads a patient with an orthopaedic trauma to undertake or not to undertake an activity, whether in prescribed conditions or in everyday life. This approach emphasized the complexity of physical, social, and contextual factors that intervene in the relationship toward activity. The data suggest that each patient can adopt avoidance, persistence, or pacing behaviours when approaching an activity. The decision to engage in a particular behaviour is based on a process of self-negotiation weighted by the circumstances, the nature of the activity, the importance attached to it, and the individual's perceived ability. The 1-year follow-up showed that patients with chronic pain who report progress tend to combine skills developed during rehabilitation with skills developed from their own experience. Rather than systematically favouring pacing, the therapist's role in rehabilitation might be to reinforce the reflexive process and the patient's adaptability in approaching the activity, to foster the capacity to find solutions for a wide variety of situations. Future research may aim to develop activity profile questionnaires that take more account of the contextual nature of decisions concerning activity, to gain a more detailed understanding of the factors the patient considers when approaching an activity.

AUTHOR CONTRIBUTIONS

This article is the result of a collective work. All the authors mentioned have discussed the results, commented on the manuscript, and approved its submission.

ACKNOWLEDGEMENTS

The authors thank the professionals at the rehabilitation center (research department, socio-professional masters), where the study was conducted, for their collaboration. They also express their gratitude to the people who participated in the study for agreeing to share their experiences. Open access funding provided by Haute Ecole Specialisee de la Suisse Occidentale.

FUNDING INFORMATION

The Swiss Fund for Medical Research of SUVA; HESAV School of Health Sciences / HES-SO University of Applied Sciences and Arts Western Switzerland. [Correction added on 2 Feb 2024 after first online publication: Funding information was added in this version]

CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

ORCID

J. Mbarga https://orcid.org/0000-0003-3276-2985

REFERENCES

Adam, P., & Herzlich, C. (2009). *Sociologie de la maladie et de la médecine*. Armand Colin.

Andrews, N. E. (2023). Participating in life roles through self-management. In H. Van Griensven & J. Strong (Eds.), *Pain, a textbook for health professionals* (Third ed., pp. 137–143). Elsevier.

Andrews, N. E., Strong, J., & Meredith, P. J. (2012). Activity pacing, avoidance, endurance, and associations with patient

functioning in chronic pain: A systematic review and meta-analysis. *Archives of Physical Medicine and Rehabilitation*, *11*, 2109–2121. https://doi.org/10.1016/j.apmr.2012.05.029

Andrews, N. E., Strong, J., Meredith, P. J., Gordon, K., & Bagraith, K. S. (2015). "It's very hard to change yourself": An exploration of overactivity in people with chronic pain using interpretative phenomenological analysis. *Pain*, *7*, 1215–1231. https://doi.org/10.1097/j.pain.0000000000000161

Antcliff, D., Keeley, P., Campbell, M., Woby, S., & McGowan, L. (2016). Exploring patients' opinions of activity pacing and a new activity pacing questionnaire for chronic pain and/or fatigue: A qualitative study. *Physiotherapy*, *102*(3), 300–307. https://doi.org/10.1016/j.physio.2015.08.001

Baszanger, I. (1986). Les maladies chroniques et leur ordre négocié. *Revue Française de Sociologie*, *7*(1), 3–27.

Beaud, S., & Weber, F. (2010). *Guide de l'enquête de terrain: produire et analyser des données ethnographiques*. La Découverte.

Beck, A. T., Rush, A. J., Shaw, B. F., & Emery, G. (1979). *Cognitive therapy of depression*. The Guilford press.

Benaim, C., Léger, B., Vuistiner, P., & Luthi, F. (2017). Validation of the French version of the "patterns of activity measure" in patients with chronic musculoskeletal pain. *Pain Research and Management*, *2017*, 6570394. https://doi.org/10.1155/2017/6570394

Berk, M., Otmar, R., Dean, O., Berk, L., & Michalak, E. (2015). The use of mixed methods in drug discovery: Integrating qualitative methods into clinical trials. In M. Tohen, C. L. Bowden, A. A. Nierenberg, & J. R. Geddes (Eds.), *Clinical trial design challenges in mood disorders* (pp. 59–74). Academic Press. https://doi.org/10.1016/B978-0-12-405170-6.00006-3

Birkholtz, M., Aylwin, L., & Harman, R. M. (2004). Activity pacing in chronic pain management: One aim, but which method? Part one: Introduction and literature review. *British Journal of Occupational Therapy*, *67*(10), 447–452.

Boltanski, L. (1971). Les usages sociaux du corps. *Annales*, *26*(1), 205–233.

Braun, V., & Clarke, V. (2021). *Thematic analysis*. Sage Publications.

Cane, D., McCarthy, M., & Mazmanian, D. (2016). Obstacles to activity pacing: Assessment, relationship to activity and functioning. *Pain*, *7*, 1508–1514. https://doi.org/10.1097/j.pain.0000000000000553

Cane, D., Nielson, W. R., McCarthy, M., & Mazmanian, D. (2013). Pain-related activity patterns: Measurement, interrelationships, and associations with psychosocial functioning. *The Clinical Journal of Pain*, *29*(5), 435–442. https://doi.org/10.1097/AJP.0b013e31825e452f

Claes, N., Crombez, G., & Vlaeyen, J. W. S. (2015). Pain-avoidance versus reward-seeking: An experimental investigation. *Pain*, *8*, 1449–1457. https://doi.org/10.1097/j.pain.0000000000000116

Claes, N., Karos, K., Meulders, A., Crombez, G., & Vlaeyen, J. W. S. (2014). Competing goals attenuate avoidance behavior in the context of pain. *The Journal of Pain*, *11*, 1120–1129. https://doi.org/10.1016/j.jpain.2014.08.003

Clark, D. A., Beck, A. T., & Alford, B. A. (1999). *Scientific foundations of cognitive theory and therapy of depression*. Wiley.

Corbin, M., & Strauss, A. (1992). A nursing model for chronic illness management based upon the trajectory framework. In P. Woog (Ed.), *The chronic illness trajectory framework – The Corbin and Strauss nursing model* (pp. 9–28). Springer Publishing Company.

Crombez, G., Eccleston, C., Van Damme, S., Vlaeyen, J. W. S., & Karoly, P. (2012). Fear-avoidance model of chronic pain: The next generation. *The Clinical Journal of Pain*, *6*, 475–483. https://doi.org/10.1097/AJP.0b013e3182385392

Esteve, R., López-Martínez, A. E., Peters, M. L., Serrano-Ibáñez, E. R., Ruíz-Párraga, G. T., González-Gómez, H., & Ramírez-Maestre, C. (2017). Activity pattern profiles: Relationship with affect, daily functioning, impairment, and variables related to life goals. *The Journal of Pain*, *5*, 546–555. https://doi.org/10.1016/j.jpain.2016.12.013

Glenton, C. (2003). Chronic back pain sufferers – Striving for the sick role. *Social Science & Medicine*, *11*, 2243–2252. https://doi.org/10.1016/S0277-9536(02)00479-3

Hasenbring, M. I., Andrews, N. E., & Ebenbichler, G. (2020). Overactivity in chronic pain, the role of pain-related endurance and neuromuscular activity: An interdisciplinary, narrative review. *The Clinical Journal of Pain*, *3*, 162–171. https://doi.org/10.1097/AJP.0000000000000785

Hasenbring, M. I., Hallner, D., Klasen, B., Streitlein-Böhme, I., Willburger, R., & Rusche, H. (2012). Pain-related avoidance versus endurance in primary care patients with subacute back pain: Psychological characteristics and outcome at a 6-month follow-up. *Pain*, *153*(1), 211–217. https://doi.org/10.1016/j.pain.2011.10.019

Hasenbring, M. I., & Verbunt, J. A. (2010). Fear-avoidance and endurance-related responses to pain: New models of behavior and their consequences for clinical practice. *The Clinical Journal of Pain*, *9*, 747–753. https://doi.org/10.1097/AJP.0b013e3181e104f2

Huijnen, I. P., Verbunt, J. A., Peters, M. L., Smeets, R. J., Kindermans, H. P., Roelofs, J., Goossens, M., & Seelen, H. A. (2011). Differences in activity-related behaviour among patients with chronic low back pain. *European Journal of Pain*, *7*, 748–755. https://doi.org/10.1016/j.ejpain.2010.11.015

Kamper, S. J., Apeldoorn, A. T., Chiarotto, A., Smeets, R. J., Ostelo, R. W., Guzman, J., & van Tulder, M. (2015). Multidisciplinary biopsychosocial rehabilitation for chronic low back pain: Cochrane systematic review and meta-analysis. *BMJ*, *350*, h444. https://doi.org/10.1136/bmj.h444

Kaufmann, J. C. (2011). *L'entretien compréhensif*. Armand Colin.

Kindermans, H. P. J., Roelofs, J., Goossens, M. E. J. B., Huijnen, I. P. J., Verbunt, J. A., & Vlaeyen, J. W. S. (2011). Activity patterns in chronic pain: Underlying dimensions and associations with disability and depressed mood. *The Journal of Pain*, *10*, 1049–1058. https://doi.org/10.1016/j.jpain.2011.04.009

Lillrank, A. (2003). Back pain and the resolution of diagnostic uncertainty in illness narratives. *Social Science & Medicine*, *6*, 1045–1054. https://doi.org/10.1016/S0277-9536(02)00479-3

Luthi, F., Vuistiner, P., Favre, C., Hilfiker, R., & Léger, B. (2018). Avoidance, pacing, or persistence in multidisciplinary functional rehabilitation for chronic musculoskeletal pain: An observational study with cross-sectional and longitudinal analyses. *PLoS One*, *9*, e0203329. https://doi.org/10.1371/journal.pone.0203329

Maxwell, J. A., & Earle Reybold, L. (2015). Qualitative research. In J. D. Wright (Ed.), *International encyclopedia of the social & behavioral sciences* (Second ed., pp. 685–689). Elsevier. https://doi.org/10.1016/B978-0-08-097086-8.10558-6

McCambridge, J., Witton, J., & Elbourne, D. R. (2014). Systematic review of the Hawthorne effect: New concepts are needed to study research participation effects. *Journal of Clinical Epidemiology*, *67*(3), 267–277. https://doi.org/10.1016/j.jclinepi.2013.08.015

McCarthy, K. S., Magliano, J. P., Snyder, J. O., Kenney, E. A., Newton, N. N., Perret, C. A., Knezevic, M., Allen, L. K., & McNamara, D. S. (2021). Quantified qualitative analysis: Rubric development and inter-rater reliability as iterative design. *ICLS 2021 Proceedings*, 139–146.

McCracken, L. M., & Morley, S. (2014). The psychological flexibility model: A basis for integration and progress in psychological approaches to chronic pain management. *The Journal of Pain*, *15*(3), 221–234.

McCracken, L. M., & Samuel, V. M. (2007). The role of avoidance, pacing, and other activity patterns in chronic pain. *Pain*, *1-2*, 119–125. https://doi.org/10.1016/j.pain.2006.11.016

Murphy, S. L., & Kratz, A. L. (2014). Activity pacing in daily life: A within-day analysis. *Pain*, *155*(12), 2630–2637.

Nielson, W. R., Jensen, M. P., Karsdorp, P. A., & Vlaeyen, J. W. S. (2013). Activity pacing in chronic pain: Concepts, evidence, and future directions. *The Clinical Journal of Pain*, *5*, 461–468. https://doi.org/10.1097/AJP.0b013e3182608561

Nielson, W. R., Jensen, M. P., Karsdorp, P. A., & Vlaeyen, J. W. S. (2014). A content analysis of activity pacing in chronic pain: What are we measuring and why? *The Clinical Journal of Pain*, *7*, 639–645. https://doi.org/10.1097/AJP.0000000000000024

Paillé, P., & Mucchielli, A. (2012). *L'analyse qualitative en sciences humaines et sociales*. Armand Colin.

Parsons, T. (1951). *The social system*. The Free Press.

Savoie-Zajc, L. (2006). Comment peut-on construire un échantillonnage scientifiquement valide? *Recherches Qualitatives*, *5*, 99–111.

Scott, P. J., McKinney, K., Perron, J., Ruff, E., Smiley, J., & Huri, M. (2017). Measurement of participation: The role checklist version 3: Satisfaction and performance. In M. Huri (Ed.), *Occupational therapy –occupation focused holistic practice in rehabilitation*. IntechOpen.

Scott-Dempster, C., Toye, F., & Barker, K. (2017). The experience of activity pacing in chronic pain management—An interpretive phenomenological analysis of out-patient physiotherapists and patients. *Physiotherapy Theory and Practice*, *33*(11), 841–849. https://doi.org/10.1080/09593985.2017.1357149

Telbizova, T., & Arnaoudova, M. (2020). The (in)visible site of pain: A review of qualitative research. *Journal of IMAB – Annual Proceeding (Scientific Papers)*, *26*(3), 3323–3327. https://www.journal-imab-bg.org

Tong, A., Sainsbury, P., & Craig, J. (2007). Consolidated criteria for reporting qualitative research (COREQ): A 32-item checklist for interviews and focus groups. International. *Journal for Quality in Health Care*, *6*, 349–357. https://doi.org/10.1093/intqhc/mzm042

Tutelman, P. R., & Webster, F. (2020). Qualitative research and pain: Current controversies and future directions. *Canadian Journal of Pain*, *4*(3), 1–5. https://doi.org/10.1080/24740527.2020.1809201

Van Damme, S., & Kindermans, H. (2015). A self-regulation perspective on avoidance and persistence behavior in chronic pain: New theories, new challenges? *The Clinical Journal of Pain*, *2*, 115–122. https://doi.org/10.1097/AJP.0000000000000096

Vasileiou, K., Barnett, J., Thorpe, S., & Young, T. (2018). Characterising and justifying sample size sufficiency in interview-based studies: Systematic analysis of qualitative health research over a 15-year period. *BMC Medical Research Methodology*, *18*, 1–18.

Vlaeyen, J. W. S., Crombez, G., & Linton, S. J. (2016). The fear-avoidance model of pain. *Pain*, *8*, 1588–1589. https://doi.org/10.1097/j.pain.0000000000000574

Vlaeyen, J. W. S., & Linton, S. J. (2012). Fear-avoidance model of chronic musculoskeletal pain: 12 years on. *Pain*, *6*, 1144–1147. https://doi.org/10.1016/j.pain.2011.12.009

Volders, S., Boddez, Y., De Peuter, S., Meulders, A., & Vlaeyen, J. W. S. (2015). Avoidance behavior in chronic pain research: A cold case revisited. *Behaviour Research and Therapy*, *64*, 31–37. https://doi.org/10.1016/j.brat.2014.11.003

Williams, J. P. (2008). Non-participant observation. In L. M. Given (Ed.), *The sage encyclopedia of qualitative research methods*. Sage Publications.

How to cite this article: Mbarga, J., Favre, C., Ribeiro, C., Pichonnaz, C., Ancey, C., Foley, R.-A., Leger, B., & Luthi, F. (2024). Beyond activity patterns: The complex process of activity management among individuals with chronic musculoskeletal pain after an orthopaedic trauma. *European Journal of Pain*, *00*, 1–17. https://doi.org/10.1002/ejp.2246