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Activity Patterns in Chronic Pain: Underlying Dimensions and Associations With Disability and Depressed Mood

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Abstract: Activity patterns are believed to play an important role in the development and perpetuation of chronic pain. So far, 3 important activity patterns have been studied: avoidance behavior, persistence behavior, and pacing behavior. Yet, empirical evidence is limited and inconclusive about the relationships between these activity patterns and important outcomes. Therefore, the present study was aimed at identifying activity patterns by means of factor analyses and determining their relationship with disability and depressive symptomatology in participants with chronic pain (N = 132). Items across different measurement instruments pertaining to 1 particular activity pattern were aggregated, and submitted to factor analysis. Results from 3 separate factor analyses revealed 6 distinct activity patterns: pain avoidance, activity avoidance, task-contingent persistence, excessive persistence, pain-contingent persistence, and pacing. In line with our hypotheses, pain and activity avoidance, and excessive persistence, were related to higher levels of disability and depressive symptomatology. In contrast to hypotheses, pacing was associated with worse outcomes as well. Interestingly, task-contingent persistence was related to lower levels of disability and depressive symptomatology. When controlling for pain and the other activity patterns, excessive persistence and activity avoidance were the most detrimental in terms of relations with depressed mood or disability. Task-contingent persistence appeared to be the least detrimental.

***Perspective:** Our findings suggest the existence of several activity patterns, which are differentially related to disability and depressive symptomatology, in participants with chronic pain. The present results are discussed in the light of previous findings, and may provide a new impetus for future studies on activity patterns in chronic pain research.*

***Key words:** Activity patterns, avoidance, pacing, persistence, disability, chronic pain, depression.*

Recent cognitive-behavioral models on pain-related disability assume that activity patterns such as avoidance, persistence, and pacing play a central role in the development and maintenance of chronic pain.[13,22,34] According to the fear-avoidance model, avoidance behavior is associated with fear of movement and pain catastrophizing resulting in disability, and numerous studies have confirmed the detrimental effects of avoidance behavior on disability and depression.[20]

Activity persistence despite pain is characterized by higher levels or more fluctuating levels of activity and is believed to have detrimental effects on disability as well through overuse.[5,10,31,34] Based on original premises on persistence behavior, a positive relationship with disability would be expected. However, empirical evidence on persistence behavior and disability is scarce, and the few studies available found persistence behavior to be associated with lower, instead of higher, levels of disability.[11,21] A possible explanation for this finding might be that these patients indeed feel less disabled, despite a higher level of pain intensity.[12]

In contrast to avoidance and persistence behavior, pacing has been introduced as an adaptive behavioral strategy and is a core element in operant pain management

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programs.[4,24] Pacing strategies may include breaking tasks into smaller, manageable pieces, taking frequent short rests, speeding up or slowing down (contrasting a patient's habitual activity), maintaining a steady pace, or using a timer to counteract pain-contingent activity.[3,4,22] Despite the widely accepted view of pacing as functional behavior, empirical evidence is lagging behind its widespread use as a clinical tool. Whereas earlier studies found pacing to be related to lower levels of disability,[22] this has not been confirmed in recent studies.[18,21] Although there is some discussion on how pacing is currently defined,[8] pacing, as conceptualized by Nielson et al[22] and McCracken and Samuel,[21] would be expected to be associated with diminished levels of disability. Thus, apart from the necessity of a clear definition, the current inconclusive results call for closer inspection of the dimensionality of pacing as it is currently operationalized and its relations to disability and depressive symptomatology.

Considering that patients may adopt several behavioral strategies instead of restricting to 1 activity pattern, McCracken and Samuel[21] studied clusters of distinct activity patterns. Results indicated that those patients with high levels of avoidance behavior and those with high levels of both avoidance and persistence behavior were the least functional group in terms of disability. However, the detrimental consequences of unique activity patterns remain unclear. Moreover, the fact that overall findings on activity patterns are ambiguous might indicate the existence of underlying dimensions. The present study was aimed at identifying important activity patterns across various self-report measures of activity patterns in participants with chronic pain, and at determining their relationship with disability and depressive symptomatology. It was hypothesized that activity patterns characterized by avoidance or persistence behavior would be equally detrimental as reflected in positive relationships with disability and depressive symptomatology. In contrast, pacing-based activity patterns are hypothesized to be functional and thus negatively related to disability and depressive symptomatology.

Methods

Participants and Procedure

The present study included 132 participants (M:F = 45:87), all recruited through advertisements in local newspapers. Participants were eligible for inclusion if they suffered from musculoskeletal pain for longer than 3 months and had fluency in the Dutch language. For female participants, pregnancy was an exclusion criterion. After obtaining informed consent, participants filled out the questionnaires either on paper or via internet. Participants were aged between 18 and 69 with a mean age of 45.62 (SD = 12.18). The duration of the pain complaints ranged from 5 months to 40 years (M = 146.82, SD = 120.23). Primary pain complaints included lower back pain (52.7%), shoulder pain (6.9%), upper limb pain (5.3%), lower limb pain (13%), pain in the cervical region (9.2%), pain in the thoracic region (3.1%), and other regions (9.9%). The minority of all participants (37.1%) were working part or full time. The present study was approved by the psychology faculty Ethical Committee of Maastricht University.

Measures

The Patterns of Activity Measure-Pain (POAM-P)

The POAM-P was developed by Cane et al[6] and translated into Dutch. The Dutch version of the POAM-P was submitted to a back translation into English, and subsequently approved by the authors of the original version. The POAM-P is a 30-item self-report questionnaire, measuring 3 activity patterns in patients with chronic pain; namely, avoidance, overdoing (ie, behavioral persistence), and pacing. Each subscale comprises 10 statements. The instructions are as follows: "People who have pain use different ways to do their daily activities. Think about how you usually do your daily activities." Participants have to indicate to which extent the statement applies to them on a 5-point scale ranging from 0 (not at all) to 4 (always). For each subscale, a separate total score is obtained by summing the scores per item which results in total score ranges from 0 to 40. Initial reliability and validity checks of the Dutch version of the POAM-P were satisfactory.[19]

The Pain and Activity Relations Questionnaire (PARQ)

The PARQ[21] is a 21-item self-report questionnaire, also measuring 3 activity patterns labelled as avoidance (8 items), pacing (6 items), and confronting (7 items). The subscale confronting measures a behavioral persistence activity pattern comparable to the overdoing subscale of the POAM-P. Participants have to rate each statement on a 6-point scale ranging from 0 (never) to 5 (always). Total scores are obtained by summing the scores on the items per subscale resulting in total scores ranging from 0 to 40 (avoidance), 0 to 30 (pacing), and 0 to 35 (confronting). Initial reliability and validity checks were satisfactory.[21]

Behavioral Responses to Illness Questionnaire (BRIQ)

The BRIQ is a 21-item self-report questionnaire developed to measure behavioral responses of patients in an acute phase of illness.[29] The questionnaire comprises 4 subscales; namely, all-or-nothing behavior (6 items), limiting behavior (7 items), emotional support seeking (4 items), and practical support seeking (4 items). In the present study, only "all-or-nothing behavior" and "limiting behavior" were selected, as these subscales measure behavioral persistence and avoidance behavior respectively. Items are answered on a 5-point scale ranging from 1 (not at all) to 5 (every day), indicating the frequency of the stated behavior for the participant. Total scores are obtained by summing the scores on the items for each subscale separately. Total scores range from 6 to 30 (all-or-nothing) and 7 to 35 (limiting). Although