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The relation of self-compassion to functioning among adults with chronic pain

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Abstract

Background: Previous research has shown that self-compassion is associated with improved functioning and health outcomes among multiple chronic illnesses. However, the role of self-compassion in chronic pain-related functioning is under-studied. The present study sought to understand the association between self-compassion and important measures of functioning within a sample of patients with chronic pain.

Methods: Treatment-seeking individuals ($N = 343$ with chronic pain) that were mostly White (97.9%) and female (71%) completed a battery of assessments that included the Self-Compassion Scale (SCS), as well as measures of pain-related fear, depression, disability, pain acceptance, success in valued activity and use of pain coping strategies.

Results: Cross-sectional multiple regression analyses that controlled for age, sex, pain intensity and pain duration, revealed that self-compassion accounted for a significant and unique amount of variance in all measures of functioning (r^2 range: 0.07–0.32, all $p < 0.001$). Beta weights indicated that higher self-compassion was associated with lower pain-related fear, depression and disability, as well as greater pain acceptance, success in valued activities and utilization of pain coping strategies.

Conclusions: These findings suggest that self-compassion may be a relevant adaptive process in those with chronic pain. Targeted interventions to improve self-compassion in those with chronic pain may be useful.

Significance: Self-compassion is associated with better functioning across multiple general and pain-specific outcomes, with the strongest associations among measures related to psychological functioning and valued living. These findings indicate that self-compassion may be an adaptive process that could minimize the negative impact of chronic pain on important areas of life.

1 | INTRODUCTION

Chronic pain is a substantial public health problem, with global prevalence rates in adults estimated to be about 10%–20% (Andrews, Steultjens, & Riskowski, 2018; Doleys, 2017; Kennedy, Roll, Schraudner, Murphy, & Mcpherson, 2014;

Nahin, 2015). The negative physical and psychological impacts of chronic pain are well documented (Boggero & Carlson, 2015; Ferreira-Valente, Pais-Ribeiro, & Jensen, 2014; Mun et al., 2017; Park & Engstrom, 2015; Viggers & Caltabiano, 2012).

Yet, there continues to be a dearth of treatment options, given that prescription opioids are no longer indicated in the

management of chronic pain (Dowell, Haegerich, & Chou, 2016; Krebs et al., 2018), and that the growth of interdisciplinary treatment facilities equipped to handle both the complex physical and psychological needs of these patients has slowed significantly (Gatchel, McGeary, McGeary, & Lippe, 2014). Identification of specific, modifiable treatment targets for this population is one potentially feasible way to improve quality of life for individuals with chronic pain within community treatment settings.

A proposed treatment mechanism within multiple mindfulness and acceptance-based interventions is self-compassion. Self-compassion was first posited by Kristen Neff (2003), who described it to consist of three components: self-kindness, common humanity and mindfulness. Generally, self-kindness is understood as being kind and understanding towards oneself, rather than self-critical, particularly during instances of pain and failure. Common humanity pertains to perceiving one's experience as part of the larger human experience rather than as separate or isolating. Lastly, mindfulness relates to the ability to hold painful thoughts and experiences in awareness rather than overidentifying with them (Neff, 2003). To date, findings indicate that self-compassion is largely associated with better psychological well-being and resilience, and lower negative affect among multiple community adult samples (Muris & Petrocchi, 2017; Zessin, Dickhäuser, & Garbade, 2015). Among the few health conditions studied (e.g., celiac disease, cancer and arthritis), self-compassion was positively associated with higher quality of life and health-promoting behaviours, indicating that it may be an important component in supporting and maintaining physical and emotional health, particularly when faced with managing a chronic medical condition (Dowd & Jung, 2017; Homan & Sirois, 2017; Pinto-Gouveia, Duarte, Matos, & Fráguas, 2014; Sirois, Kitner, & Hirsch, 2015; Sirois, Molnar, & Hirsch, 2015).

Research focusing on self-compassion in the context of chronic pain is limited. Preliminary cross-sectional work has shown self-compassion to have a positive relation to functioning in chronic pain samples. For example, self-compassion has been associated with higher levels of emotional resilience and positive affect, and lower levels of depression, pain catastrophizing and pain-related disability among those with chronic pain (Costa & Pinto-Gouveia, 2011, 2013; Purdie & Morley, 2016; Wren et al., 2012). Longitudinal data examining the effectiveness of an interdisciplinary Acceptance and Commitment Therapy (ACT) treatment programme found changes in self-compassion-mediated improvements in disability, depression, pain-related anxiety, number of medical visits and the number of classes of prescribed analgesics (Vowles, Witkiewitz, Sowden, & Ashworth, 2014). Other mindfulness and acceptance-based treatment approaches that have targeted self-compassion have also found increases to be associated with improvements in overall quality of life, pain acceptance and depression severity (Doran, 2014; Peters et al., 2017).

Taken together, current research indicates that self-compassion is a preliminary factor in developing and maintaining psychological well-being. Among chronic pain samples, cross-sectional findings suggest that self-compassion may also be an effective and modifiable treatment target. However, it is unclear if self-compassion on its own may be associated with pain-specific measures of functioning over and above important pain and demographic variables. Given these gaps, the current study sought to better understand the role of self-compassion in eight measures of functioning in adults with chronic pain presenting for interdisciplinary pain treatment. It was hypothesized that higher levels of self-compassion would be associated with greater functioning across all eight domains, while controlling for age, gender, pain duration and usual pain intensity. Specifically, self-compassion would be positively associated with pain acceptance, use of pain coping strategies and success in values-based activities, and negatively associated with depression severity, pain anxiety and physical and psychosocial disability.

2 | METHOD

2.1 | Participants

Data from 343 participants was collected between March 2010 and December 2011 and 339 participants were included in the present analyses. One participant was excluded due to missing data (>75% missing responses), and three participants were removed due to outlying scores on one of the nine measures used in the study. Participants were treatment-seeking individuals with chronic pain, who were referred by their primary care providers to a community-based interdisciplinary pain clinic in the Midlands of the United Kingdom.

The sample was primarily White European (97%) women (71%), who were cohabitating (66%). A full description of the sample demographic characteristics can be found in Table 1. The median pain duration of the sample was about 7 years (*Med* = 7.21, *Range* = 0.17–61.33), with 50% (*N* = 168) of the sample not working due to pain. The most common pain site reported was low back (53%), followed by full body pain (13%). The most commonly utilized pain treatments reported by patients were pain medications (86%), followed by physiotherapy (65%) and transcutaneous electrical nerve stimulation (TENS; 53%).

2.2 | Procedures

Participants were given a set of standardized measures before attending an initial assessment appointment at the clinic. Participants were instructed to fill out all measures

TABLE 1 Sample demographic information

Variable	N	M (SD) or Percent
Age	339	51.66 (14.58)
Gender[*]		
Men	96	29%
Women	236	71%
Race/Ethnicity[*]		
White	327	97%
Black (Caribbean)	2	1%
Indian	2	1%
Other Asian	1	<1%
Pakistani	1	<1%
Other	1	<1%
Marital status[*]		
Single	47	14%
Married/Co-Habitating	220	66%
Divorced	41	12%
Widowed	27	8%
Years of education[*]	260	12.77 (2.89)

[*]Does not add up to 339 due to missing data/no response.

before arrival to their initial appointment. A research co-ordinator was available during appointments to check for missing data and assist participants in completing the measures, if needed. Participants were not compensated for completing these questionnaires. Informed consent was obtained prior to assessment and the study was approved by the local Research Ethics Board of the National Health Service.

2.3 | Measures

2.3.1 | Self-compassion scale

Self-compassion was measured using the 24-item Self-Compassion Scale (SCS; Neff, 2003), with questions such as, "I am kind to myself when I am experiencing suffering", "When I see aspects of myself that I don't like I get down on myself" and "When things are going badly for me, I see the difficulties as part of life that everyone goes through". Responses were measured on a 5-point Likert-type scale from 1 (almost never) to 5 (almost always). Total score was used for these analyses, with higher scores indicating higher levels of self-compassion. Among those with chronic pain, higher scores on the SCS have been associated with lower negative affect, pain catastrophizing and pain disability (Costa &

Pinto-Gouveia, 2013). In addition, the SCS has been found to be valid and reliable in a number of clinical and non-clinical samples, including college students, community adults and those with recurrent depression (Neff, Whitaker, & Karl, 2016). In the current sample, the internal consistency for the SCS was 0.92, indicating strong reliability.

2.3.2 | Sickness impact profile

Physical and psychosocial functioning was measured using the 136-item Sickness Impact Profile (SIP; Bergner, Bobbitt, Carter, & Gilson, 1981). The measure provides composite scores for Physical Disability and Psychosocial Disability, by assessing 12 domains that measure the effect of a health problem on daily functioning. The physical domain is made up of items that pertain to Ambulation, Mobility and Body Care and Movement scales, while the psychosocial domain is made up of items that pertain to Social Interaction, Alertness, Emotional Behaviour and Communication scales. Higher scores indicate higher severity in disability, and are associated with shorter standing/walking times, fewer daily tasks accomplished, poorer satisfaction in social relationships and increased depression severity (Follick, Smith, & Ahern, 1985; Watt-Watson & Graydon, 1989). Both functioning subscales have demonstrated adequate validity, reliability and clinical utility in a community-dwelling adult and chronic pain sample (Bergner et al., 1981; Follick et al., 1985). In the current sample, the internal consistency for the Physical Disability domain was 0.82, and 0.86 for the Psychosocial Disability domain, indicating good reliability.

2.3.3 | British Columbia major depression inventory

Depression severity was measured using the 20-item British Columbia Major Depression Inventory (BCMDI; Iverson & Remick, 2004). Items correspond with the Diagnostic Statistical Manual, Fourth Edition criteria for Major Depression (APA, 1994), with the first 16 items pertaining to specific symptoms and the last 4 items assessing impact of symptoms on work, family, school and social activities. For the symptom items, respondents were asked to endorse symptoms that were present within the past 2 weeks, and then rate the severity of their symptoms on a 5-point Likert-type scale between 1 (very mild) and 5 (very severe). A total symptom severity score was used for the present analyses, which was calculated by summing only the symptom items together and excluding the impact items. Higher scores indicate worse symptom severity. The BCMDI demonstrated adequate validity and reliability, and was clinically useful in classifying Major

Depression among a community sample, however, has not been examined in a chronic pain sample at this time (Iverson & Remick, 2004). In the current sample, the internal consistency for the BCMDI was 0.90, indicating strong reliability.

2.3.4 | Chronic pain acceptance questionnaire

Pain acceptance was measured using the 20-item Chronic Pain Acceptance Questionnaire (CPAQ; McCracken & Eccleston, 2006). Items pertain to assessing frequency of behaviours aimed at controlling pain as well as engagement in value-based activities regardless of pain levels (McCracken, Vowles, & Eccleston, 2004). Responses were measured on an 8-point Likert-type scale from 0 (never true) to 7 (always true). A total score was used, with higher scores indicating more pain acceptance. The CPAQ has shown adequate validity and reliability in multiple chronic pain samples (McCracken et al., 2004; Reneman, Dijkstra, Geertzen, & Dijkstra, 2010), and has been associated with lower mental distress and disability (McCracken & Eccleston, 2006; Viane et al., 2003). In the current sample, the internal consistency for the CPAQ was 0.86, indicating good reliability.

2.3.5 | Chronic pain values inventory

Values success was measured using the 12-item Chronic Pain Values Inventory (CPVI; McCracken & Yang, 2006). It was used to assess values success, or how well one is living in concordance with six broad valued domains: family, intimate relations, friends, work, health and growth or learning. Responses are measured on a 6-point Likert-type Scale from 0 (not at all important/successful) to 5 (extremely important/successful). A mean success score was used for the present analyses. Higher success scores indicate more success at living in concordance with one's values, and has demonstrated adequate validity and reliability in a chronic pain sample (McCracken & Yang, 2006). Higher value success scores have been associated with better physical and psychosocial functioning, and lower depressive symptoms and depression-related interference (McCracken & Yang, 2006; Vowles, McCracken, Mccracken, Sowden, & Ashworth, 2014). In the current sample, the internal consistency for the CPVI was 0.89, indicating good reliability.

2.3.6 | Brief pain coping inventory-2

Pain-related coping was measured using the 19-item Brief Pain Coping Inventory-2 (BPCI-2; McCracken, Eccleston, &

Bell, 2005). Items correspond to two subscales: use of flexible pain coping strategies and use of traditional pain coping strategies. Typically, traditional pain coping strategies pertain to attempts to try and control pain levels through strategies such as exercise, relaxation, distraction and positive self-statements. Flexible coping strategies relate to psychological flexibility, and include accepting pain and pain-related distress, present moment-focused awareness and engagement in value-based activities with or without pain (McCracken & Vowles, 2007). For each item, respondents were asked to indicate the number of days in the past seven they had used each coping strategy. Both subscales were used in the present analyses and were derived by summing the subscale items together, with higher scores indicating higher utilization of coping strategies. Additionally, higher scores on both subscales have been associated with greater physical and psychosocial functioning, as well as higher engagement in valued activity and pain acceptance (Vowles, Mccracken, et al., 2014). Previous research has indicated that the flexible coping subscale may be more strongly associated with positive treatment outcomes than the traditional coping subscale (McCracken & Vowles, 2007; Vowles & McCracken, 2010). In the current sample, the internal consistency for the flexible pain coping subscale was 0.77, and 0.70 for the traditional pain coping subscale, indicating adequate reliability.

2.3.7 | Pain anxiety symptom scale

Pain anxiety was measured using the 20-item Pain Anxiety Symptom Scale (PASS; McCracken, Zayfert, & Gross, 1992). Items assess four domains that correspond to aspects of pain anxiety, which include cognitions, physiological anxiety symptoms, fear of pain and attempts at escape/avoidance of pain. Respondents were asked to rate how frequently each item occurred on a 6-point Likert-type scale, with responses ranging from 0 (never) to 5 (always). A total score was used, with higher scores indicating more pain anxiety. The PASS has shown to be adequately valid and reliable in a community sample of adults and chronic pain sample with varying pain diagnoses (McCracken et al., 1992; Osman, Barrios, Osman, Schneekloth, & Troutman, 1994). The PASS has been shown to predict severity of disability, pain interference and emotional distress among community and chronic pain samples (McCracken et al., 1992; Osman et al., 1994). In the current sample, the internal consistency for the PASS was 0.92, indicating strong reliability.

2.3.8 | Pain and demographic Information

Demographic variables included self-reported age, gender, race, marital status, employment status and years of education. In regard to pain-specific information, pain duration in

years, primary and secondary pain sites, utilization of previous pain treatments, and usual pain intensity in the past 7 days as measured on a numerical rating scale (Ferreira-Valente et al., 2011) from 0 (no pain) to 10 (worst possible pain) were also collected.

2.4 | Data analysis plan

Descriptive statistics were calculated for all demographic variables, as well as the eight outcome measures. Assumptions testing for the planned regression analyses included estimates of skew and kurtosis (Tabachnick & Fidell, 2013). Potential outliers for each outcome measure were identified via stem and leaf plots and visual inspection. As stated previously, three cases were removed from the present analyses due to outlying scores on one of the nine measures. To test the relation of self-compassion to the eight outcome measures, eight separate cross-sectional linear regressions were conducted, controlling for demographic and pain variables. For each linear regression, demographic variables were entered in the first step, which included participant age and gender. Gender was dummy coded (1 = women, 2 = men) before being entered into each linear regression. In the second step, pain-specific variables were entered, which included the total number of years the participant had experienced pain (pain duration), and their usual pain intensity for the past week. In the third and final step, self-compassion score was entered. The criterion variables for the eight linear regressions were physical and psychosocial disability, depression, pain acceptance, success in valued activities, use of traditional pain coping strategies, use of flexible pain coping strategies and pain anxiety. Beta weights were examined to determine the directional relation between self-compassion and the outcome measures. The unique variance accounted for by demographic variables, pain variables and self-compassion were examined to determine the contribution of each set of variables in the outcome measures. All statistical analyses were carried out using SPSS Version 25 (IBM Corp., 2017).

3 | RESULTS

The means and standard deviations for all measures can be found in Table 2. There was no evidence of significant skew or kurtosis for any of the predictor variables (Tabachnick & Fidell, 2013). As hypothesized, self-compassion was a significant predictor in all eight linear regressions, indicating that self-compassion accounted for a significant and unique amount of variance in physical and psychosocial disability, depression, pain acceptance, success in valued activities, use of traditional pain coping strategies, use of flexible pain coping strategies and pain anxiety. Further, beta weights

TABLE 2 Mean and standard deviation of each study measure for the entire sample

Variable	M (SD)
Self-compassion	75.90 (20.03)
Physical functioning	0.24 (0.21)
Psychosocial functioning	0.25 (0.20)
Depression	28.43 (16.33)
Pain acceptance	47.40 (19.26)
Values success	2.19 (1.28)
Traditional pain coping	26.80 (12.02)
Flexibility in pain coping	39.59 (15.73)
Pain anxiety	45.88 (22.22)

Note: Self-compassion was assessed via the SCS, disability (physical and psychosocial) via the SIP, depression via the BCMDI, pain acceptance via the CPAQ, values success via the CPVI, pain coping behaviours via the BPCI-2, and pain-related anxiety via the PASS.

indicated that self-compassion was associated with the outcome measures in the hypothesized directions. Particularly, self-compassion was positively associated with pain acceptance, use of traditional and flexible pain coping strategies, and success in value-based activities, and negatively associated with depression severity, pain anxiety and physical and psychosocial disability. These results are displayed in Table 3.

To determine which outcome measures might be more strongly influenced by self-compassion, variance accounted for by self-compassion scores within each functioning measure was examined. Self-compassion contributed the largest amount of unique variance in depression severity. The overall model was significant [$r^2 = 0.44$, $F(5, 199) = 31.23$, $p < 0.001$], with self-compassion accounting for 32% unique variance in depression severity scores. The second largest unique variance of self-compassion was observed in pain acceptance. The overall model was significant [$r^2 = 0.38$, $F(5, 156) = 18.92$, $p < 0.001$], with self-compassion accounting for 29% unique variance in pain acceptance scores. Third was psychosocial disability, and the overall model was significant [$r^2 = 0.32$, $F(5, 202) = 18.87$, $p < 0.001$] with self-compassion accounting for 27% unique variance in psychosocial disability scores. Next, self-compassion accounted for an equal amount of unique variance (23%) in flexibility in pain coping and pain anxiety scores. Both models were significant [flexibility in pain coping: $r^2 = 0.26$, $F(5, 154) = 10.74$, $p < 0.001$; pain anxiety: $r^2 = 0.31$, $F(5, 194) = 17.44$, $p < 0.001$]. Following this, self-compassion accounted for 14% unique variance in values success scores, and the overall model was significant [$r^2 = 0.17$, $F(5, 176) = 7.01$, $p < 0.001$]. Lastly, self-compassion accounted for the least amount of unique variance in traditional pain coping and physical functioning

TABLE 3 Regression coefficients and variance accounted for among each linear regression model

Step	Predictor	β[a]	95% C.I. for ß	Δr^2	Total r^2
Physical functioning					
1	Age	0.156[*]	0.000–0.004	0.02	
	Gender[b]	−0.014	−0.06–0.05		
2	Pain duration	0.071	−0.001–0.004	0.06[***]	
	Usual pain	0.176[**]	0.01–0.04		
3	Self-compassion	−0.263[***]	−0.004–−0.001	0.07[***]	0.14[***]
Psychosocial functioning					
1	Age	−0.032	−0.002–0.001	0.02	
	Gender[b]	−0.006	−0.06–0.05		
2	Pain duration	−0.019	−0.003–0.002	0.03[*]	
	Usual pain	0.108	−0.001–−0.03		
3	Self-compassion	−0.535[***]	−0.007–−0.004	0.27[***]	0.32[***]
Depression					
1	Age	−0.046	−0.18–0.08	0.03	
	Gender[b]	−0.054	−5.58–1.83		
2	Pain duration	−0.044	−0.22–0.10	0.10[***]	
	Usual pain	0.243[***]	1.28–3.28		
3	Self-compassion	−0.578[***]	−0.54–−0.37	0.32[***]	0.44[***]
Pain acceptance					
1	Age	−0.068	−0.27–0.09	0.03	
	Gender[b]	−0.138[*]	−11.03–0.46		
2	Pain duration	0.071	−0.11–0.35	0.06[**]	
	Usual pain	−0.177[**]	−3.65–−0.58		
3	Self-compassion	0.562[***]	0.41–0.65	0.29[***]	0.38[***]
Values success					
1	Age	−0.061	−0.02–0.01	0.01	
	Gender[b]	0.104	−0.10–0.67		
2	Pain duration	−0.060	−0.22–0.01	0.01	
	Usual pain	−0.007	−0.10–0.10		
3	Self-compassion	0.384[***]	0.02–0.03	0.14[***]	0.17[***]
Traditional pain coping					
1	Age	−0.054	−0.18–0.09	0.002	
	Gender[b]	−0.057	−5.37–2.41		
2	Pain duration	−0.014	−0.17–0.15	0.01	
	Usual pain	0.132	−0.12–1.93		
3	Self-compassion	0.277[***]	0.07–0.24	0.07[***]	0.08[***]
Flexibility in pain coping					
1	Age	−0.050	−0.22–0.10	0.00	
	Gender[b]	−0.024	−5.71–4.00		
2	Pain duration	0.033	−0.16–0.25	0.03	
	Usual pain	−0.117	−2.50–0.22		
3	Self-compassion	0.490[***]	0.27–0.48	0.23[***]	0.26[***]
Pain anxiety					

TABLE 3 (Continued)

Step	Predictor	ß[a]	95% C.I. for ß	Δr^2	Total r^2
1	Age	0.074	−0.83–0.31	0.02	
	Gender[b]	0.097	−1.07–10.40		
2	Pain duration	−0.104	−0.47–0.44	0.06[**]	
	Usual pain	0.187[**]	0.87–3.95		
3	Self-compassion	−0.497[***]	−0.66−−0.40	0.23[***]	0.31[***]

Notes: 1 = women, 2 = men.

[a]Standardized final beta.

[b]Dummy coded.

*$p < 0.05$;

**$p < 0.01$;

***$p \leq 0.001$.

scores (7%). Both models were significant [traditional pain coping: $r^2 = 0.08$, $F(5, 170) = 3.11$, $p < 0.001$; physical disability: $r^2 = 0.14$, $F(5, 204) = 6.71$, $p < 0.001$].

4 | DISCUSSION

The key findings from this study are: (a) self-compassion was a significant predictor of all eight measures of functioning, (b) self-compassion was positively associated with pain acceptance, use of traditional and flexible pain coping strategies and success in valued activities, and negatively associated with depression severity, pain anxiety and physical and psychosocial disability; and lastly, (c) self-compassion accounted for more variance in measures of depression, pain acceptance, psychosocial disability, use of flexible pain coping strategies and success in valued activities, and less variance in measures of physical disability and use traditional pain coping strategies.

Self-compassion entails bringing a non-judgemental kindness to the experience of pain, suffering, and failures and understanding these difficult experiences to be unavoidable and part of the human condition. It is to recognize that even in the face of failure and discomfort, one is worthy of compassion, respect and forgiveness, just as all other human beings are (Neff, 2003). While these definitions coincide with the main tenants of mindfulness and acceptance-based treatments, self-compassion cultivates additional and unique skills. For example, all of these treatments teach individuals to bring a non-judgmental awareness to their experience, no matter the physical sensations, emotions, or thoughts that are present (Kabat-Zinn, 2015; Kabat-Zinn, Lipworth, & Burney, 1985). However, the practice of self-compassion also has individual's actively foster kindness and understanding towards themselves, and to see themselves as part of a larger community. By doing this, individuals may not only effectively respond to and live better with distress, but also promote an improved sense of self-efficacy and connectedness with others that is

not entirely present in other mindfulness and acceptance-based treatments.

In the context of chronic pain, self-compassion does not aim to reduce primary suffering (i.e., physical pain) but rather attempts to reduce secondary suffering (i.e., ineffective responses to pain; Scott & McCracken, 2015). Therefore, it may reduce critical self-judgements and, in turn, foster successive gains in functioning despite pain. It may also be helpful in reducing unrealistic social role standards that often impede pain acceptance, adjustments and pacing attempts that are often necessary in functioning well with chronic pain (Neff, 2003; Purdie & Morley, 2016). The current findings, in addition to the previous literature, illustrate that self-compassion may be an effective and adaptive process in reducing pain interference, rather than pain itself. This is particularly highlighted in that self-compassion scores accounted for the highest amount of variance in measures related to emotional and social functioning, pain acceptance and engagement in value-based activities, rather than measures related to physical disability and use of coping strategies that attempt to reduce pain intensity.

Treatments that involve self-compassion components have shown relative efficacy in improving functioning among chronic pain patients. ACT has shown that self-compassion contributes to two integral ACT treatment processes (Vowles, Sowden, & Ashworth, 2014). Further, changes in self-compassion after receiving ACT was found to be directly associated with improvements in physical and psychosocial disability, medical visits and analgesic use (Vowles, Witkiewitz, et al., 2014). Other treatment approaches that include self-compassion training as part of the treatment, such as mindfulness and positive psychology interventions, have also contributed to improvements in happiness, quality of life and depression (Doran, 2014; Peters et al., 2017). The current findings extend this literature by showing that self-compassion alone is associated with better functioning. It may be warranted to further tailor these interventions to target self-compassion more directly. In addition, developing

a brief self-compassion intervention for chronic pain patients could be adequate in improving life with pain. Previous studies have examined brief self-compassion interventions targeting a variety of clinical issues, including substance use (Held, Owens, Thomas, White, & Anderson, 2018), body dissatisfaction (Moffitt, Neumann, & Williamson, 2018) and non-suicidal self-injury and related thoughts (Jiang et al., 2017). There has not yet been a brief self-compassion treatment developed or tested within a chronic pain sample, which may be more feasible and accessible than other intensive behavioural health care options. A brief intervention may also be easier to disseminate and implement within community medical settings where most chronic pain patients present for treatment first.

4.1 | Study limitations

There are at least two limitations to the current study that should be taken into consideration when interpreting these results. First, the analyses presented are cross-sectional in nature and do not imply causation between self-compassion scores and functioning measures. In addition, the temporal precedence between self-compassion and the eight outcome measures cannot be established. While previous literature has examined longitudinal changes in self-compassion and functioning and found some support for causality, this cannot be determined from the current analyses. Second, the study sample is primarily treatment seeking, cohabitating, white women and may not generalize to other demographic characteristics, such as men, racial/ethnic minorities and non-treatment-seeking populations.

4.2 | Conclusion

The current study findings, in addition to the previous literature, suggest that self-compassion is an effective and adaptive process in improving functioning among adults with chronic pain. Furthermore, it may be most effective in helping to reduce the impact of chronic pain in important and valued domains of life, rather than reducing pain intensity itself. Treatments that target self-compassion have shown promising results within multiple chronic pain samples and impact a broad array of general and pain-specific functioning measures. While the evidence behind targeting self-compassion in the general population is fairly robust, emphasis on self-compassion in chronic pain treatment needs further examination. Future research should continue to examine the relationship between self-compassion and functioning among more demographically diverse chronic pain samples to better understand how these findings might generalize to the broader population as well as which individuals this treatment target may be most salient

for. Future research should also refine and adapt current interventions, such as ACT and Mindfulness, to target self-compassion more directly. Further, it may also be helpful to explore the development and implementation of a brief intervention to increase self-compassion. Findings from the current study suggest that treatment, in any form, may stand to be improved by the addition of self-compassion training to better help individuals cope with the impact of chronic pain.

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