

Pain severity, coping and satisfaction with life in patients with chronic pain

Walker SP, MSocSc (CounsPsych), PhD

Senior Lecturer, Unit for Professional Training and Services in the Behavioural Sciences (UNIBS)

University of the Free State

Esterhuysen KGF, PhD, Department of Psychology, University of the Free State

Correspondence to: Stephen Walker, e-mail: walkersp@ufs.ac.za

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Abstract

Objectives: The primary study aim was to determine whether or not a statistically significant relationship exists between pain severity and satisfaction with life in patients with chronic pain. The second aim was to explore the extent to which coping responses might influence this relationship.

Design: A cross-sectional non-experimental research design was employed.

Setting and subjects: A sample of 172 adults suffering from chronic pain was recruited from the outpatient clinic at the Pain Control Unit at Universitas Hospital in Bloemfontein.

Outcome measures: Participants completed measures of pain severity (Pain Severity Scale of the West-Haven-Yale Multidimensional Pain Inventory), satisfaction with life (Satisfaction with Life Scale) and coping responses (Coping Responses Inventory-Adult version).

Analysis: Pearson correlation coefficients were calculated between the measures of pain severity and satisfaction with life. Regression analyses were employed to explore the effect of coping responses on the relationship between pain severity and satisfaction with life.

Results: A statistically significant negative correlation was apparent between pain severity and satisfaction with life. Approach coping was found to moderate the relationship between pain severity and satisfaction with life, while avoidance coping appeared to have no significant effect on this relationship. The relationship between pain severity and satisfaction with life appears to change as a function of the level of approach coping exhibited by individuals suffering from chronic pain.

Conclusion: Satisfaction with life significantly correlates with pain severity in patients with chronic pain. Approach coping moderates this relationship.

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Introduction

Chronic pain is a major public health concern, not least because of an increased burden on healthcare services, loss of productivity in the workplace and associated psychosocial difficulties.¹⁻³ The predominating theoretical perspectives emphasise a holistic biopsychosocial conceptualisation of chronic pain. From a biopsychosocial perspective, an individual's experience of chronic pain is viewed as a uniquely subjective experience in which a number of factors and processes may act as catalysts and modulators. Pain severity is frequently associated with increased physical incapacity, a higher prevalence of psychosocial difficulties

and lower satisfaction with life.³⁻⁶ Reported pain severity was also found to influence the judgement of patients' levels of physical limitation with regard to, and satisfaction with life in, anaesthesiology registrars.⁷ Pain severity appears to be meaningfully associated with satisfaction with life among patients with chronic pain.

Pain severity appears to be viewed by most patients and healthcare professionals as a salient indicator of the seriousness and debilitation potential of chronic pain.^{2,4,7} Consequently, pain severity could significantly influence the extent to which patients perceive that chronic pain limits their ability to function in important life domains, and their

ability to live a fulfilling life, despite their pain. However, there doesn't seem to be evidence of a consistent linear relationship between the severity of the pain and individuals' experiences and their satisfaction with life. It has been suggested that a number of cognitive and behavioural processes might modulate the interaction between pain severity and disability, as well as the interaction between pain severity and satisfaction with life.⁸⁻⁹ It seems possible that the behavioural and cognitive strategies that individuals employ in order to cope with chronic pain may account for some of the apparent variability in the relationship between pain severity and satisfaction with life.

The process of coping with chronic pain and other significant health-related stressors has received significant attention over the past three decades. The vast majority of research in this area has been conducted within the broad context of the cognitive appraisal approach to stress and coping. This particular approach subscribes to a definition of coping as cognitive and behavioural attempts to manage internal or external demands that an individual perceives as threatening to overwhelm him or her.¹⁰ In order to successfully cope with the stressors they face, individuals are said to initially engage in a process of cognitive appraisal. Cognitive appraisal involves evaluation of the specific situation that the individual faces as either benign, challenging or threatening; assessment of the behavioural and cognitive responses available to the individual; and an estimation of the potential outcomes based on the anticipated efficacy of the available behavioural and cognitive responses.¹⁰ An individual's emotional response to a specific stressor is largely determined by the outcome of the cognitive appraisal process in which the individual engages with regard to the stressor.

The cognitive appraisal perspective on coping was later extended with the development of an integrative framework of coping that views an individual's attempts at coping with stressors to be influenced by both dispositional (personal and environmental) and contextual (environmental) factors.¹¹ Relatively stable dispositional factors, such as personality structure, social resources and preferred coping styles, interact with more transient contextual factors, such as life events and trauma, to influence cognitive appraisal of specific situations and stressors. These cognitive appraisals then form the basis for the selection of specific coping responses. Coping responses may be broadly categorised as either approach or avoidant. Approach coping is characterised by cognitive and behavioural attempts to actively deal with the stressor, e.g. cognitive restructuring, problem solving or seeking social support, while avoidance coping includes attempts to avoid dealing directly with the stressor, e.g. distraction, withdrawal and venting emotions.¹⁰⁻¹¹

Historically, approach coping has been considered to result in more favourable outcomes. However, to date, research

has failed to support the notion that approach coping is preferable to avoidance coping across samples and stressors. A recent study that investigated the influence of coping responses on adjustment to pain in a small heterogeneous sample of patients with chronic pain found that maladaptive (avoidance) coping was strongly associated with increased depression and interference in daily function.¹² However, the same study also found that more adaptive (approach) coping strategies were associated with increases in pain intensity. In another study among nurses and midwives with lower back pain, active (approach) coping was found to have no protective effect with regard to the amount of sick leave taken.¹³ Variable findings are also evident within the South African context. Avoidance coping has been found to be associated with incapacity, pain severity, lack of control and emotional distress experienced by patients with chronic pain, while no association was found between approach coping and the aforementioned pain-related variables.¹⁴ By contrast, another study that was conducted on a heterogeneous sample of patients with chronic pain found that approach coping related positively to satisfaction with life. In addition, approach coping was found to moderate the relationship between perceived stress and satisfaction with life in this sample, while no significant effect was found with respect to avoidance coping.⁶ It appears that while coping responses have been associated with a number of pain-related outcomes, no consistent relationship has emerged with regard to the respective effects of approach and avoidance coping on adjustment, psychological well-being or satisfaction with life in individuals suffering from chronic pain.

The literature would seem to suggest that the severity of the pain that an individual with chronic pain experiences relates to a number of outcome variables, such as mobility, mental health and satisfaction with life. However, the relationship between pain severity and the aforementioned variables does not appear to be linear. It has been hypothesised that a number of cognitive and behavioural factors exert an influence on this relationship. One of the more intensively researched intervening variables in this regard is coping. However, there appears to be some disagreement on the exact role of different forms of coping in the chronic pain context. Consequently, the current study aimed to contribute to the body of research on coping with chronic pain by specifically exploring whether or not a relationship exists between pain severity and satisfaction with life in a sample of patients with chronic pain, as well as ascertaining whether or not different forms of coping (approach and avoidance) have a specific effect on this relationship.

Method

Ethical clearance to conduct the study was obtained from the Ethics Committee of the Faculty of Health Sciences at the University of the Free State. One hundred and ninety participants were recruited via convenience sampling of

patients with chronic pain visiting the Pain Control Unit at Universitas Hospital in Bloemfontein. All participants were 18 years of age or older, and no exclusions were made on the basis of diagnosis. Written informed consent was obtained from all individuals prior to participation in the study.

Afrikaans-speaking individuals (172 participants) comprised 90.5% of the sample. In the interests of homogeneity, a decision was made to include data collected from Afrikaans-speaking participants only in the analyses. Women accounted for 73.3% of the sample, while the average age of the participants was 56 years (standard deviation = 12.8). Injury (35.4%) was the most commonly reported cause of chronic pain in the sample, followed by chronic pain of spontaneous origin (32.6%) and chronic pain with no identifiable origin (19.2%). Postoperative onset pain accounted for 12.8% of the chronic pain reported by the sample. With regard to the chronicity of the pain reported by participants, 98 (57%) individuals claimed to have experienced chronic pain for a period in excess of five years, 38 (22.1%) for two years or longer, while the remaining 20.9% of the sample reported pain chronicity of 12 months or less.

Participants' pain severity was measured using the Pain Severity Scale (PSS) of the West-Haven-Yale Multidimensional Pain Inventory (WHYMPI).¹⁵ The Satisfaction with Life Scale (SWL) provided an indication of the sample's global satisfaction with life, while coping (approach and avoidance) was measured via the Coping Responses Inventory- Adult (CRI-A) version.¹⁶⁻¹⁷ Participants completed Afrikaans translations of the abovementioned questionnaires. Reliability analyses yielded acceptable levels of internal consistency for the translated versions of all the questionnaires (PSS of the WHYMPI: $\alpha = 0.827$, SWL: $\alpha = 0.826$, CRI-A approach coping subscale: $\alpha = 0.871$, and CRI-A avoidance coping subscale: $\alpha = 0.746$).¹⁸

Results

The initial aim of the study was to determine whether or not a statistically significant relationship exists between pain severity and satisfaction with life in patients with chronic pain. To this end, the correlation between the PSS scores of the WHYMPI and the SWL was calculated ($r = -0.198$, $p\text{-value} \leq 0.01$). A statistically significant inverse relationship was found to exist between pain severity and satisfaction with life. Consequently, the higher the level of pain severity reported by the participants, the lower their reported satisfaction with life. The correlation between pain severity and satisfaction with life is indicative of a small to medium effect size ($r = -0.198$). This finding is thus of moderate practical significance.¹⁹

Given that a statistically significant relationship exists between pain severity and satisfaction with life, product term regression analyses were employed to investigate the second aim of the study, and more specifically, to determine

the effect of coping responses (approach and avoidance) on this relationship. The results of the regression analysis with approach coping as an intervening variable are reflected in Table I.

Table I: Product term regression analysis with approach coping as intermediate variable

Step	Criterion: satisfaction with life	β	p-value
1	Pain severity	-0.198	p-value < 0.01
Alt. 1	Approach coping	0.122	-
2	Pain severity	-0.192	-
	Approach coping	0.109	-
3	Product: approach coping' pain severity	-0.199	p-value < 0.01

Note: When the product term was conducted in step 3, deviation scores were used to prevent multicollinearity
Alt. 1: the alternate step in the analysis

It is clear from Table I (step 1) that a significant ($p\text{-value} \leq 0.01$) relationship existed between pain severity and satisfaction with life in the current sample. It is also apparent that the higher the levels of pain severity reported by the participants, the lower their levels of life satisfaction. Furthermore, approach coping did not exhibit a significant relationship with life satisfaction in step 1. In step 2, pain severity continued to demonstrate a significant relationship with satisfaction with life, but approach coping failed to have an effect on the relationship between the two aforementioned variables. However, a significant product term was evident in step 3. It can be deduced that approach coping exerts a moderating effect on the interaction between pain severity and satisfaction with life. Consequently, the relationship between the adverse condition (pain severity) and the criterion (satisfaction with life) was investigated with specific reference to those participants measuring either high (75th percentile, $n = 44$) or low (25th percentile, $n = 42$) on the moderator variable (approach coping). To this end, two separate regression lines were calculated and are represented in Figure 1.

The regression line (Figure 1) for participants in the bottom quartile of approach coping scores exhibits a relatively steep negative gradient (-2). Although the regression line for participants in the top quartile of approach coping scores also demonstrates a negative relationship between pain severity and satisfaction with life, the gradient is less steep (-0.76). It would thus appear that participants who reported the lowest levels of approach coping (bottom quartile) in the current sample experienced a rapid decline in their quality of life as their pain severity increased. Participants who reported the higher levels of approach coping (top quartile) appeared to experience less of a reduction in their quality of life as their pain severity increased. In addition, the decline in satisfaction with life reported by participants in the top quartile of approach coping scores was less rapid than that of participants in the bottom quartile.

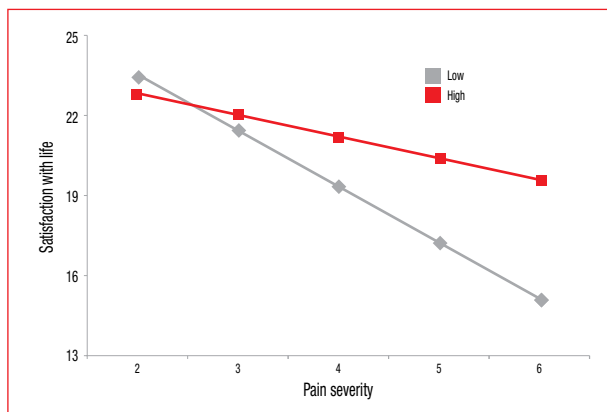


Figure 1: Regression lines of high and low approach coping, with pain severity as a predictor variable

The potential effect of avoidance coping on the relationship between pain severity and satisfaction with life was also investigated. The results of the product term regression analysis with avoidance coping as an intervening variable are reflected in Table II.

Table II: Product term regression analysis with avoidance coping as intermediate variable

Step	Criterion: satisfaction with life	β	p-value
1	Pain severity	-0.198	p-value < 0.01
Alt. 1	Avoidance coping	-0.150	-
2	Pain severity	-0.174	-
	Avoidance coping	-0.111	-
3	Product: Avoidance coping* pain severity	0.129	-

Note: When the product term was conducted in step 3, deviation scores were used to prevent multicollinearity

Alt. 1: the alternate step in the analysis

It is apparent from Table II that avoidance coping did not exhibit a significant direct relationship with satisfaction with life in the current sample in step 1. Furthermore, avoidance coping appeared to neither mediate (step 2) nor moderate (step 3) the relationship between pain severity and satisfaction with life.

Discussion

The current study had two aims. The primary aim was to determine whether or not a statistically significant relationship exists between pain severity and satisfaction with life in patients with chronic pain. The second aim of the study was to explore the possible intervening effects of different forms of coping on the relationship between pain severity and satisfaction with life in the sample. The analyses revealed a statistically significant negative correlation between pain severity and satisfaction with life. It would appear that an inverse relationship existed with regard to these variables among the participants. Higher levels of pain severity seem to be associated with lower levels of life satisfaction. Within the current sample, pain

severity seemed to impact significantly on the ability of sufferers with chronic pain to lead meaningful and fulfilling lives. This finding appears to be in line with the general trend in the chronic pain literature that links increases in pain severity with poorer health, psychosocial and functional outcomes.^{4-5,7-9}

Having established a statistically significant correlation between pain severity and satisfaction with life, it was possible to determine whether or not different coping responses (approach or avoidance) employed by the participants influenced this relationship significantly. Product term regression analyses revealed a significant moderating effect by approach coping with regard to the relationship between pain severity and satisfaction with life. The interaction between pain severity, satisfaction with life and approach coping was further investigated by comparing those participants who employed high levels of approach coping (the top quartile) with those who reported lower levels of approach coping (the bottom quartile). A comparison of the regression lines indicated that while individuals in both quartiles exhibited a reduction in their life satisfaction relative to pain severity, participants who reported lower levels of approach coping experienced a greater decline than those who reported higher levels of approach coping. In addition, participants in the bottom quartile appeared to experience a more rapid decline in satisfaction with life than those who reported higher levels of approach coping (the top quartile). Avoidance coping responses were not found to have a significant influence on the relationship between pain severity and satisfaction with life in the current sample.

The findings summarised in the preceding paragraph would seem to suggest that in the current sample, the application of approach coping responses, such as actively seeking solutions to problems and engaging in cognitive restructuring, as well as making effective use of available social and professional resources, moderated the effect that pain severity had on chronic pain sufferers' satisfaction with life. More specifically, individuals who reported higher levels of approach coping experienced a smaller reduction in their satisfaction with life.

Furthermore, the rate at which their satisfaction with life deteriorated relative to increases in pain severity was slower than that exhibited by the participants who reported low levels of approach coping. These findings appear to be supported by a body of research that suggests that employing more active means of adapting to chronic pain results in improved physical, functional and psychological outcomes.^{6,13-14} However, these findings are not consistently supported in the literature. There is some evidence that certain coping responses may be effective at certain stages of recovery and rehabilitation, but not during others. Coping responses that are more avoidant in nature have been associated with better outcomes during the initial stages

of treatment for chronic lower back pain, while approach or active coping strategies appear to be more beneficial in the later stages of treatment and maintenance.⁴ In addition, individual variability has also been found to impact on the preferred approaches to coping with chronic pain, as well as on the outcome. It seems that while approach coping responses have widely been regarded as resulting in more favourable outcomes, there is a certain subset of individuals who suffer from chronic pain for whom more passive or avoidance coping responses result in better outcomes.^{6,9,14,20}

The current study demonstrates that a statistically significant relationship exists between pain severity and satisfaction with life in individuals suffering from chronic pain. It seems that despite a number of environmental and psychosocial factors having been proven to influence the adjustment and well-being of patients with chronic pain, pain severity continues to be a significant determinant of life satisfaction in this population. The implication, from a clinical perspective, appears to be that while chronic pain is best managed within a holistic, multi-professional context, medical interventions that directly target pain severity are likely to positively affect outcome in the majority of cases. In addition, while no specific coping orientation appeared to negate or reverse the impact of pain severity on satisfaction with life, higher levels of approach coping were shown to result in a less rapid and severe decline in satisfaction with life. By contrast, avoidance coping did not demonstrate a significant effect on the relationship between pain severity and satisfaction with life. It appears that interventions that aim to promote approach coping in individuals with chronic pain could be expected to result in lower rates of psychosocial dysfunction and prolong the time that patients are able to continue living subjectively meaningful and satisfying lives, despite their chronic pain. However, this study, together with numerous others suggests that the relationship between coping responses and psychosocial outcomes with regard to chronic pain are neither linear nor universally consistent. Consequently, the importance of individually customised pain management regimens cannot be overemphasised.

The current study is not without limitations. A relatively small sample from a specific cultural, linguistic group in a certain geographic locale was utilised. Consequently, it may not be possible to reliably generalise the findings of the study to a wider population with chronic pain. Furthermore, exclusive reliance on self-report measures of coping does not provide a means of controlling whether the participants actually implemented the coping responses they endorsed on the questionnaire. In addition, only the influence of coping was investigated with regard to pain severity and satisfaction with life. It is not possible to determine the effect of other variables that have been shown to impact on the cognitive appraisal of pain-related stressors, e.g. catastrophising cognitions, pain beliefs and injury avoidance beliefs and acceptance, in this specific instance. It might be advisable for future researchers to investigate the nature of the

interaction between coping and other variables in facilitating an effective adjustment to chronic pain. Comparing the utility of various conceptualisations of coping, based on different theoretical taxonomies, might also make a significant contribution to further illuminating the specific role of coping in functional, health and psychosocial outcomes in individuals suffering from chronic pain.

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