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The Relation Between Catastrophizing and Occupational Disability in Individuals with Major Depression: Concurrent and Prospective Associations

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Abstract *Background* Catastrophic thinking has been associated with occupational disability in individuals with debilitating pain conditions. The relation between catastrophic thinking and occupational disability has not been previously examined in individuals with debilitating mental health conditions. The present study examined the relation between catastrophic thinking and occupational disability in individuals with major depression. *Methods* The study sample consisted of 80 work-disabled individuals with major depressive disorder (MDD) who were referred to an occupational rehabilitation service. Participants completed measures of depressive symptom severity, catastrophic thinking and occupational disability at admission and termination of a rehabilitation intervention. Return-to-work outcomes were assessed 1 month following the termination of the rehabilitation intervention. *Results* Cross-sectional analyses of admission data revealed that catastrophic thinking contributed significant variance to the prediction of self-reported occupational disability, beyond the variance accounted for by depressive symptom severity. Prospective analyses revealed that reductions in catastrophic thinking predicted successful return to work following the rehabilitation intervention, beyond the variance accounted for by reductions in depressive symptom severity. *Conclusions* The findings suggest that catastrophic thinking is a determinant of occupational disability in individuals with major depressive disorder. The findings further suggest that interventions designed to reduce catastrophic thinking might promote occupational re-integration in individuals with debilitating mental health conditions.

Keywords Catastrophic thinking · Depression · Pain · Disability

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Introduction

Catastrophizing has been identified as a psychosocial risk factor for prolonged occupational disability in individuals with debilitating pain conditions [1]. In the context of pain, catastrophizing has been defined as an exaggerated negative *mental set* brought to bear during actual or anticipated pain experience [2]. Across a wide range of debilitating pain conditions, the results of cross-sectional and prospective studies have revealed that catastrophizing is associated with higher levels of occupational disability [2–4].

Depression now surpasses pain as the leading cause of disability worldwide [5, 6]. The magnitude of the work-disability problem associated with depression has been steadily increasing over time, which has prompted calls for more research on the determinants of occupational disability in individuals who are depressed [7]. Given the centrality of catastrophizing to cognitive models of depression, it is surprising that there has been little research examining the relation between catastrophizing and occupational disability in individuals who are depressed [8]. It

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is possible that the psychosocial factors that contribute to occupational disability in individuals with debilitating pain conditions might also contribute to occupational disability in individuals with depression.

Until recently, there was no validated measure of catastrophizing suitable for use with individuals with depression. The majority of studies on catastrophizing have been conducted using measures with item content specific to the experience of pain symptoms [9, 10]. The Symptom Catastrophizing Scale (SCS) was recently developed to assess catastrophic thinking in a wide range of debilitating health and mental health conditions. The item content of the SCS was derived from the Pain Catastrophizing Scale (PCS) but modified to be applicable to individuals with mental health conditions. Preliminary investigations have supported the reliability and validity of the SCS as a measure of catastrophic thinking in individuals with depression [11, 12].

The present study examined the relation between catastrophizing and occupational disability in individuals with depression. Work-disabled participants with depression completed measures of depressive symptom severity, catastrophizing and occupational disability at admission and termination of an occupational rehabilitation intervention. Return-to-work outcomes were assessed 1 month following the termination of the rehabilitation intervention. It was hypothesized that catastrophizing would contribute significant variance to the prediction of self-reported occupational disability, beyond the variance accounted for by depressive symptom severity. It was also hypothesized that treatment-related reductions in catastrophizing would be associated with a higher probability of occupational re-engagement following participation in a rehabilitation program.

There are important clinical and theoretical implications to research addressing the determinants of occupational disability associated with depression. From a clinical perspective, the identification of depression-related risk factors for occupational disability might point to new avenues of intervention to promote re-employment in work-disabled individuals with depression. From a theoretical perspective, increased knowledge about the determinants of work-disability associated with depression might lead to the development or refinement of conceptual models of work-disability associated with debilitating mental health conditions.

Method

Participants

The study sample consisted of 80 work-disabled individuals with Major Depressive Disorder (MDD). Data were drawn from the clinical files of consecutive referrals to an occupational rehabilitation service in Ontario, Canada. Individuals with a diagnosis of a co-morbid health or mental health disorder were not included in the study sample. All participants had been employed full time prior to the current period of sick leave, and were receiving long-term disability benefits when they were referred to the occupational rehabilitation service. Information about participants' diagnoses was taken from their long-term disability insurance files. Records were only retained for inclusion in the study sample if file review clearly indicated that a diagnosis of MDD had been confirmed by a medical or mental health specialist. The majority of the study sample (66 %) was married or living common law, and had completed at least 12 years of schooling (76 %).

Measures

Depressive Symptoms

The Patient Health Questionnaire-9 (PHQ-9) was used to assess depressive symptom severity [13]. Participants indicated how frequently they experienced each of 9 symptoms of depression. The response scale consists of a 4-point frequency scale with the endpoints (0) '*not at all*' and (3) '*everyday*'. PHQ-9 scores can range from 0 to 27 with higher scores indicating more severe depressive symptoms. The reliability and validity of this measure have been established in several different clinical samples [14, 15].

Catastrophizing

The Symptom Catastrophizing Scale (SCS) was used to assess catastrophic thinking related to the experience of depressive symptoms. The 7 items of the SCS were drawn from the Pain Catastrophizing Scale (PCS; [10]) (items 1, 4, 5, 6, 9, 12, 13). The instructional set of the original PCS was modified such that individuals responded to the items with reference to their '*health or mental health condition*' instead of their '*pain*'. Participants rated the frequency with which they experienced different catastrophic thoughts using a 3-point scale with the anchors (0) *never*, (1) *sometimes* and (2) *often*. Responses were summed to yield a total score that could range between 0 and 14. The SCS has been shown to be internally reliable and correlated with measures of symptom severity and disability [11]. The internal consistency coefficient for the SCS in the present study was .81.

Self-Reported Disability

Self-reported occupational disability was assessed with a single item, *Please choose a number between '0' and '10' to indicate how disabled you are for your occupational*

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activities as a result of your health or mental health condition. Participants rated the severity of their occupational disability on an 11-point Likert scale with the endpoints (0) *not at all disabled* and (10) *totally disabled.*

Return to Work

Participants were contacted by telephone 1 month following the termination of their rehabilitation program and interviewed about their current occupational status. On the basis of the interview, participants' occupational status was classified as (1) return to work full time, (2) return to work part-time, (3) enrolled in a graduated return to work program, and (4) did not return to work.

Procedure

The Research Ethics Board of the McGill University Health Centre approved this archival study. The study sample was drawn from the clinical files of individuals who were enrolled in a 10 week risk-targeted activity-reintegration intervention. The primary objective of the intervention was to promote rehabilitation progress by reducing psychosocial barriers and encouraging reintegration into life-role activities and return-to-work. Catastrophizing was one of the psychosocial barriers targeted by the intervention. The intervention included various techniques aimed at reducing catastrophizing, such as empathic reflection, guided disclosure, validation, thought monitoring, problem solving, and goal setting [16]. These techniques were incorporated within the framework of an activity-reintegration program that focused on activity resumption using structured activity scheduling and graduated resumption of discontinued activities. Clinicians met with participants once per week for a total of 10 weeks. The PHQ-9, the SCS and the self-reported disability measure were completed pre-, mid- and post-treatment. For the purposes of this paper, only pre- and post-treatment evaluations were considered in data analyses. The risk-targeted activity-reintegration intervention in which participants were enrolled is described in more detail elsewhere [17].

Data Analytic Approach

Descriptive statistics were computed on all study variables. T-tests for independent variables were used to compare women and men on study variables. Multiple linear regression was used to examine the value of pre-treatment SCS scores in the prediction of self-reported occupational disability. T-tests for paired variables were used to examine treatment-related changes in depressive symptoms, catastrophizing and self-reported disability. Logistic repression was used to examine the value of treatment-related changes in catastrophizing in predicting follow-up occupational status. Tolerance coefficients for all variables included in the regression analysis were greater than .60 indicating no problem of multicollinearity. All analyses were conducted with SPSS Version 21.

Ten participants discontinued the intervention prematurely and did not complete the post-treatment assessment. For participants with incomplete post-treatment data, pre-treatment scores were carried forward. Analyses of treatment-related changes and predictors of return to work were conducted on an intent-to-treat basis.

Results

Sample Characteristics

Demographic information, means and standard deviations on all study variables are presented in Table 1. Means and standard deviations on the PHQ9 were similar to those that have been reported in previous research on work-disabled individuals with MDD [18–20]. Based on scores on PHQ-9, the study sample would be characterized as experiencing moderately severe depressive symptoms at the time of admission.

T-tests for independent samples were computed to compare women and men on measures of depressive symptom severity, catastrophizing and self-reported occupational disability. As shown in Table 1, women and men did not differ significantly in age, t (78) = .47, ns, or the duration of the current period of sick leave, t (78) = 1.2, ns. Women and men did not differ significantly in their scores on the PHQ-9, t (78) = 1.5, ns, the SCS, t (78) = .21, ns, or the measure of self-reported occupational disability, t (78) = .18, ns.

Correlates of Catastrophizing

Pearson correlations were conducted on pre-treatment assessment measures to examine the relations between

Table 1 Sample Characteristics at the Time of Admission

Variables	Women (n = 54)	Men (n = 26)	*P*
Age	45.7 (8.3)	46.7 (9.5)	ns
Duration (months)	16.8 (7.8)	19.7 (14.1)	ns
PHQ-9 (/27)	19.3 (5.1)	17.2 (6.7)	ns
SCS (/14)	10.8 (2.6)	10.7 (3.2)	ns
DISAB (/10)	8.4 (1.9)	8.3 (1.6)	ns

N = 80

Duration duration of work-disability, *PHQ-9* patient health questionnaire, *SCS* symptom catastrophizing scale, *DISAB* occupational disability rating

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Table 2 Correlates of catastrophizing in individuals with major depressive disorder

	1	2	3	4	5
1. SCS	–				
2. PHQ9	.52**	–			
3. DISAB	.45**	.45**	–		
4. Age	.02	.13	.05	–	
5. Duration	.01	−.03	.03	.01	–

SCS symptom catastrophizing scale, *PHQ-9* patient health questionnaire, *DISAB* self-reported occupational disability

** $p \leq .01$

catastrophizing, depressive symptom severity and self-reported disability. As shown in Table 2, scores on the measure of catastrophizing were significantly correlated with depressive symptom severity and self-reported occupational disability. The magnitude of correlations among these measures was similar to that which has been reported in other studies with work-disabled individuals with persistent pain conditions [2, 21].

Catastrophizing as a Predictor of Occupational Disability

Cross-sectional analyses on pre-treatment assessment measures were conducted to evaluate whether catastrophizing contributes to occupational disability beyond the variance accounted for by depressive symptom severity. A hierarchical multiple regression was used to assess the value of catastrophizing in predicting the level of occupational disability associated with MDD (Table 3). Age and duration of work-disability were entered in Step 1 of the analysis but did not contribute significantly to the prediction of self-reported occupational disability, F_{change} $(2, 77) = .16$, $p < .85$. Depressive symptoms severity was entered in Step 2 of the analysis and made a significant contribution to the prediction of self-reported occupational disability, F_{change} $(1, 76) = 19.6$, $p < .001$. Catastrophizing was entered in Step 3 of the analysis and contributed significant variance to the prediction of self-reported occupational disability, beyond the variance accounted for by age, duration of work absence and depressive symptom severity, F_{change} $(1, 75) = 6.1$, $p < .01$. In the final regression equation, depressive symptom severity ($\beta = .30$, $p < .01$) and catastrophizing ($\beta = .29$, $p < .01$) made significant unique contributions to the prediction of self-reported occupational disability.

Table 3 Hierarchical Regression Predicting Self-Reported Occupational Disability

	β	R^2change	Fchange	p
Step 1				
Age	.00			
Duration	.01	.001	.16 (2, 77)	.79
Step 2				
PHQ9	.30**	.20	19.6 (1, 76)	001
Step 3				
SCS	.29**	.06	6.1 (1, 75)	.01

$N = 80$

Duration duration of work-disability, *PHQ9* patient health questionnaire 9, *SCS* symptom catastrophizing scale. Beta coefficients are from the final regression equation

** $p < .01$

Treatment-Related Changes in Depression, Disability and Catastrophizing

T-tests for paired samples were conducted to examine treatment-related changes in scores on measures of depression, catastrophizing and self-reported occupational disability (Table 4). Analyses revealed significant reductions in scores on the PHQ9, $t(89) = 8.0$, $p < .001$, the SCS, $t(89) = 9.6$, $p < .001$, and self-reported occupational disability, $t(89) = 9.4$, $p < .001$. The magnitude of change in these variables (38–41 %) indicates that the observed changes would be considered clinically meaningful [22, 23].

Predicting Occupational Re-engagement from Reductions in Depression and Catastrophizing

At one-month follow-up, 21 participants (26 %) had returned to work full time, 3 participants (4 %) had returned to work part-time, and 36 participants (45 %) were enrolled in a graduated return-to-work program. Twenty participants (25 %) remained absent from work.

A logistic regression was conducted to examine the degree to which treatment-related reductions in depressive symptom severity and catastrophizing predicted occupational re-engagement at follow-up (Table 5). For this analysis, occupational re-engagement was operationalized as having returned to some form of employment (e.g., working full or part-time, or enrolled in a graduated return-to-work program). Change scores (pre-treatment–post-treatment) on the PHQ9 and the SCS were computed and used as predictor variables. Age, sex and duration of work-disability were entered in the first step of the analysis, but did not contribute significantly to the prediction of occupational re-engagement, $\chi^2 = 1.8$, $p = .60$. Change scores on the PHQ9 were entered in the second step of the analysis and contributed significantly to the prediction of occupational re-engagement, $\chi^2 = 5.9$, $p = .01$. Change

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Table 4 Treatment-Related Changes in Depression, Catastrophizing and Disability

	Initial assessment	Post-treatment assessment	%Reduction
PHQ9	18.1 (5.8)	11.2 (4.3)	38
SCS	10.6 (2.7)	6.2 (3.3)	41
DISAB	8.4 (1.6)	4.9 (2.5)	41

Values in parentheses are standard deviations

PHQ9 patient health questionnaire 9, *SCS* symptom catastrophizing scale, *DISAB* self-reported occupational disability

Table 5 Logistic regression examining the value of changes in depression and catastrophizing in predicting occupational re-engagement

	Model	β	S.E	Wald	df	Sig	OR	95 % CI
Step 1	Age	−.038	.03	.99	1	.31	.963	.89–1.03
	Sex	−.09	.66	.20	1	.88	.90	.24–3.35
	Work disability	.015	.03	.19	1	.66	1.01	.94–1.08
Step 2	Δ PHQ9	.03	.06	.30		.58	1.03	.91–1.17
Step 3	Δ SCS	.36	.14	6.61	1	.01	1.4	1.09–1.91

Note. Work disability = duration of work disability; Δ PHQ9 = change in PHQ9 scores from pre- to post-treatment; Δ SCS = change in SCS scores from pre- to post-treatment. All values are from the final regression equation. Nalgelkerke $R^2 = .485$

scores on the SCS were entered in the final step of the analysis, and also contributed significant variance to the prediction of occupational re-engagement, $\chi^2 = 9.1$, $p = .001$. In the final regression equation, only change scores on the SCS made a significant unique contribution to the prediction of occupational re-engagement, OR = 1.4 (95 % CI = 1.0–1.9), $p = .01$. Overall classification success was 72 %.

Discussion

Previous research has shown that catastrophizing is a determinant of occupational disability in individuals with musculoskeletal pain conditions [17, 22, 24]. Previous research has also shown that interventions designed to reduce catastrophizing in individuals with musculoskeletal conditions have been associated with improved return-to-work outcomes [1, 25]. The results of the present study extend previous research in showing that catastrophizing is also associated with occupational disability in individuals with MDD. In addition, the results of the present study showed that treatment-related reductions in catastrophizing are associated with increased probability of occupational re-engagement in work-disabled individuals with MDD. To our knowledge, this is the first study to show that targeting catastrophizing in a rehabilitation intervention can lead to improved return-to-work outcomes in individuals with debilitating mental health conditions.

Numerous investigations have pointed to a relation between depression and occupational disability [7, 24, 26, 27]. Depressive symptoms have been associated with increased number of sick days, poorer performance of occupational tasks, lower levels of productivity, and longer periods of work-disability [5, 26, 28]. Symptom severity has been identified as one of the strongest predictors of work-disability in individuals with MDD [29, 30].

The results of the present study are consistent with previous research showing a relation between depressive symptom severity and occupational disability. In cross-sectional analyses, depressive symptom severity accounted for 20 % of the variance in self-reported occupational disability. Catastrophizing accounted for 6 % of the variance in self-reported occupational disability, after controlling for age, duration of work absence and depressive symptom severity. The magnitude of the relation between catastrophizing and self-reported disability was comparable to that which has been reported in work-disabled individuals with persistent pain conditions [31].

The findings of the present study are consistent with previous research showing that reductions in depressive symptom severity are associated with more positive employment outcomes [27, 32, 33]. The results of a logistic regression revealed that reductions in depressive symptom severity were associated with higher probability of occupational re-engagement following participation in a rehabilitation program. Reductions in catastrophizing contributed significantly to the prediction of occupational re-engagement, after controlling for age, duration of work absence and depressive symptoms. When reductions in catastrophizing were entered in the regression, the contribution of reductions in depressive symptom severity to occupational re-engagement was no longer significant. The pattern of findings suggests that reductions in

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catastrophizing might be one of the vehicles through which reductions in depressive symptom severity influence return-to-work outcomes.

In individuals with pain conditions, catastrophizing has been shown to impact negatively on a number of occupationally-relevant factors. Numerous investigations have shown that catastrophizing is associated with more severe symptoms of pain [2, 3]. Several studies have shown that catastrophizing is associated with activity intolerance [34–37]. Catastrophizing has also been associated with longer periods of bed rest following the onset of musculoskeletal pain [38] and longer periods of work absence in individuals with musculoskeletal pain [39]. In individuals with whiplash injuries, catastrophizing has been associated with greater perceived work demands during the performance of a simulated occupational lifting task [40]. It is possible that similar processes underlie the relation between catastrophizing and occupational disability in individuals with depression. In the context of depression, catastrophizing might lead to more severe depressive symptoms as a result of exaggerated negative appraisals of life stresses. Catastrophizing might also contribute to activity withdrawal, thereby impacting negatively on individuals' ability to meet their occupational demands. More research is needed to clarify whether the pathways linking catastrophizing to depressive symptom severity and occupational disability are the same as those that have been revealed in research on pain-related disability.

Research to date has been clear in showing that interventions that are designed to reduce the severity of depressive symptoms can lead to improved occupational outcomes [30]. The findings the present study suggest that combining symptom-focused interventions with interventions designed to reduce catastrophizing with might yield superior occupational outcomes compared to symptom-focused interventions alone.

The collection of treatment techniques included in the risk-targeted intervention used in this study could be subsumed under the general rubric of cognitive-behavioural treatment (CBT). However, risk-targeted interventions differ in important ways from traditional CBT approaches to the treatment of depression. Many of the treatment techniques used in CBT for depression are designed to target 'theory-relevant' factors, not all of which have been supported by research. Risk-targeted interventions include only techniques that aim to reduce risk factors that have been shown to influence relevant outcomes such as symptom severity or work-disability [17]. To date, comparisons of risk-targeted interventions and traditional CBT for depression have not been conducted. It is possible that intervention approaches that are specifically tailored to individuals' risk profile might yield more positive outcomes than traditional CBT approaches to treatment of work-disabled individuals with debilitating mental health conditions.

Some degree of caution must be exercised in the interpretation of the study findings. First, data records were drawn from the clinical files of individuals referred to an occupational rehabilitation service. Only a minority of individuals with debilitating health or mental health conditions are referred for occupational rehabilitation services. All participants were receiving long-term disability benefits. In addition, participants' diagnosis was drawn from medical files as opposed to being verified independently according to research criteria. The sample did not include individuals with co-morbid health or mental health conditions as their inclusion would have necessitated stratifying analyses according to diagnosis, and would have had implications for the sample size necessary to conduct predictive analyses. These sample characteristics necessarily have implications for the generalizability of findings.

It is also necessary to consider that a wide range of symptom-related, treatment-related and work-place factors that have been shown to impact on occupational outcomes were not assessed in this study. Whether the contributions of catastrophizing to occupational outcomes are independent of the contributions of other symptom-related, treatment-related or workplace factors remains to be clarified by future research. It is also important to note that the sample consisted only of individuals who were working full time prior to the current period of work absence. It is not clear whether the findings are generalizable to depressed individuals who have never been gainfully employed. The modest sample size also limited the nature of analytic procedures that could be applied to the data. Finally, occupational re-engagement was operationalized as return to some form of employment. Approximately half the participants classified as being occupationally re-engaged were enrolled in a graduated return-to-work program. Although the majority of individuals who successfully complete a graduated return-to-work program resume their full-time occupational activities, not all do. Greater confidence in the findings of this study awaits replication in a larger sample with a longer period of follow-up.

Archival treatment studies have inherent limitations associated with lack of control over the choice of assessment measures, and limited detail about approaches to diagnosis and case assignment. Archival treatment studies, however, also have advantages. The present study made use of data collected by a national network of occupational rehabilitation service providers who delivered the same standardized intervention. The 'homogeneity' of treatment afforded by standardized interventions can provide the ideal platform for addressing research questions of theoretical and practical importance. Capitalizing on the

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existence of networks of service providers delivering the same standardized intervention also reduces the costs associated with conducting clinical outcome research. Even though standardized interventions consistently outperform intuition-based approaches to treatment, they are still underrepresented in the repertoire of services offered to work-disabled individuals with debilitating health or mental health conditions. Strategies or incentives for increasing the use of standardized treatment of individuals who are work-disabled could have significant positive impact on clinical outcomes and might also foster more collaboration between researchers and the clinical practice community.

In spite of limitations, the results of the present study suggest that the relations among catastrophizing, symptom severity and disability that have been reported in individuals with pain are also evident in individuals with depression. The findings of the present study suggest that reductions in catastrophizing might be one of the vehicles through which depressive symptom reduction contributes to occupational re-engagement. Occupational outcomes of work-disabled individuals with depression might be enhanced by combining symptom reduction interventions with interventions specifically designed to reduce catastrophizing. Future research on risk-factors for work-disability in individuals with debilitating mental health conditions might contribute to the development of more effective and cost-efficient approaches to symptomatic treatment and rehabilitation.

Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest relevant to the material presented in this paper.

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