



The Association Between Case Manager Interactions and Serious Mental Illness Following a Physical Workplace Injury or Illness: A Cross-Sectional Analysis of Workers' Compensation Claimants in Ontario

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Abstract

Poor mental health is a common occurrence among workers recovering from a work-related injury or illness. The objective of this cross-sectional study was to estimate the association between adverse interactions with workers' compensation case managers and experiencing a serious mental illness 18-months following a workplace injury or illness. A cohort of 996 workers' compensation claimants in Ontario Canada were interviewed 18 months following a disabling work-related injury or illness. Perceptions of informational and interpersonal justice in case manager interactions were defined as the primary independent variables, and Kessler Psychological Distress (K6) scores greater than 12, indicative of a serious mental illness, was defined as the outcome. Multivariate modified Poisson models estimated the association between perceptions of adverse case manager interactions and a serious mental illness, following adjustment for sociodemographic and work characteristics and pre-injury mental health. The prevalence of serious mental illness at 18 months was 16.6%. Low perceptions of informational justice, reported by 14.4% of respondents, were associated with a 2.58 times higher risk of serious mental illness (95% CI 1.30–5.10). Moderate and low perceptions of interpersonal justice, reported by 44.1% and 9.2% of respondents respectively, were associated with a 2.01 and 3.57 times higher risk of serious mental illness (95% CI moderate: 1.18–3.44, 95% CI poor: 1.81–7.06). This study provides further support for the impact of poor interactions with claims case managers on mental health, highlighting the importance of open and fair communication with workers' compensation claimants in ensuring timely recovery and return-to-work.

Keywords Occupational injuries · Mental disorders · Workers' compensation

Introduction

Workers' compensation systems are designed to minimize the financial harms of experiencing a work-related injury or illness and facilitate recovery and return-to-work. Yet, prior research has shown that workers' compensation claimants

often have poorer health outcomes than those injured outside of work [1–4]. Claimants often report high levels of stress during the claims process and are more likely to develop long-term mental health problems, such as depression and post-traumatic stress disorder [5, 6]. In Ontario, as many as 50% of claimants have been found to experience depressive symptoms in the first year following a workplace musculoskeletal injury [7]. Further, mental health problems that emerge after a workplace injury or illness can persist for years afterwards, inhibiting long-term physical recovery and re-entry to the workforce [8–10].

In order to improve mental health outcomes among workers' compensation claimants, it is important to identify the modifiable elements of the workers' compensation process that may be contributing to poorer mental health. One factor that appears to be central to recovery and return-to-work

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following a workplace injury is communication between the claimant and important actors in the claim, including employers/work supervisors, colleagues and claims case managers [11]. Case managers, are responsible for adjudicating the claim and communicating with the claimant about benefit provisions, wage replacement and return-to-work planning. Poor experiences with case managers, including adversarial communication, as well as difficulty in accessing information, have been identified as a key source of stress and impediment to recovery among compensation claimants [12]. A recent study conducted in Victoria, Australia also found that poorer perceived fairness in communications with case managers was linked to poorer long-term mental health outcomes [13].

This relationship has not yet been substantiated in other jurisdictions or compensation systems. In addition, studies conducted to date have not included information on pre-injury/illness mental health, preventing an examination of whether case manager interactions are linked to new cases of mental illness, or an exacerbation of pre-existing mental health problems.

This study aims to examine the relationship between claimant perceptions of case manager interactions and experiencing a serious mental illness (defined as a mental, behavioural or emotional disorder resulting in serious functional impairment) 18 months following a physical workplace injury or illness [14]. It is hypothesised that there will be a higher prevalence of serious mental illness among those who reported poorer perceptions of case manager interactions.

Methods

Study Population and Recruitment

Workers' compensation claimants in Ontario, Canada who filed lost-time injury or illness claims between June 2019 and March 2020 were identified from administrative records held at the Workplace Safety and Insurance Board (WSIB) of Ontario, approximately 18 months following their initial injury/illness. The WSIB provides no-fault insurance coverage to Ontario workers for wage replacement, medical care and other costs related to injuries that occur at a workplace. Approximately two thirds of the Ontario workforce are covered for work-related injuries and illnesses by the WSIB, totaling 319,000 businesses across 16 industries, insuring 5.6 million workers [15]. In 2018, the WSIB registered 253,991 claims, and provided wage replacement or health care benefits to 194,614 workers.

Most claims are resolved within a short time period, with 86% of claimants returning to work within 3 months [15]. Therefore, in order to ensure there were a sufficient number of participants with longer and potentially more serious

injuries or complex claims in the sample, we aimed to recruit participants in approximately equal numbers from 3 sample groups: group 1 consisted of lost-time claimants with a claim duration of 5 days to 3 months, group 2 included those with a claim lasting 3 to 12 months, and group 3 included those with an active claim at 12 to 16 months following the initial date of injury or illness. Claimants with a physical injury or occupational disease, aged 18 or older, and who were able to conduct an interview in English or French were eligible for inclusion in the study sample. Claimants with a psychological injury claim, in the survivors' or serious injury programs (indicating a death, serious injury or permanent disability as a result of the work injury) or who had a traumatic head injury resulting in impaired communication were excluded.

In total 9,745 claimants were randomly selected from the eligible population from which the WSIB contacted 2,816 participants between June 2019 and February 2020, following a pre-specified monthly quota. Those who consented were subsequently contacted by the study team to determine eligibility and arrange a time for interview. Claimants who participated were compared to the original random sample on age, gender, industry, geographic location, benefit duration and employer size.

Data Collection

Interviewer-administered questionnaires were conducted 18 months following initial injury or illness. The questionnaire covered topics including return-to-work and labour market status, sources of income, function, recovery and measures of physical and mental health, interactions between the claimant and their case managers and healthcare providers, workplace accommodations provided, and sociodemographic and workplace characteristics.

Outcome Variable: Serious Mental Illness

The key outcome variable in this study was serious mental illness within the 18 months following a workplace injury or illness as measured using the Kessler 6-item (K6) scale [16]. This scale has been validated among a general population sample against the World Health Organization's Composite International Diagnostic Interview Short-Form (CIDI-SF) scales for anxiety and mood disorders [16, 17]. Respondents were presented with 6 symptoms (e.g., 'so depressed that nothing could cheer you up) and asked to indicate how often they experienced these symptoms within the past 4 weeks, with response options ranging from 0 or 'none of the time' to 4 or 'all of the time'. Scores were then summed, and a cutoff point of 13 was used to indicate a serious mental illness. This cutoff point has been found to have a sensitivity of 36% and a specificity of 96% in identifying serious mental illness in the general population [16]. Claimants who self-reported

a mental health diagnosis since the time of injury, but did not meet the criteria for a serious mental illness at the 18-month interview using the K6 scale were excluded to avoid potential misclassification, as these individuals may have had episodes of mental illness that had already resolved by the time of interview.

Independent Variables: Interpersonal and Informational Justice

Perceptions of fairness in case manager interactions were measured using 2 scales developed within a Canadian workers' compensation cohort [18]. Participants were asked to rate their communications with the agent to whom they most recently spoke regarding their claim. The first 2-item scale measured perceived fairness in manner of case manager interaction, including whether the case manager was polite and treated the respondent with dignity and respect. Each item was measured on a 5-point scale ranging from 1 or 'Strongly Agree' to 5 or 'Strongly Disagree'. The mean score across these items was calculated, representing a measure of case manager interpersonal justice. The second 5-item scale, measured using the same response options, included items concerning the information provided by the case manager, including whether the case manager provided the information they needed, and the openness and truthfulness of the case manager. The mean score across items within this scale represented informational justice. A mean score rather than a sum score was used to ensure that a 1-unit difference retained its original meaning on the response scale. All respondents who answered at least 1 question on each of the scales was included rather than deleting those with missing items within a scale, as recommended [19].

In total, 91 claimants reported that they were not assigned a case manager for their claim. These claims are likely short-term, straightforward claims that were filed electronically. In order to include this group, a categorical variable was created for each of the 2 scales, with 4 groups: those without a case manager, those with a mean score of less than 2 on the perceived fairness scale (indicating high perceived justice), those with a mean score of 2–3 (indicating moderate perceived justice), and those with a mean score of 4–5 (indicating low perceived justice). Previous work confirmed the factor structure applied in this analysis [13]. Internal consistency was high for both the informational ($\alpha = 0.93$) and interpersonal ($\alpha = 0.92$) justice scales in this sample. The correlation between the interpersonal and information justice scales was 0.86.

Other Covariates

Other covariates measured included age, self-reported gender, level of education, being born in Canada, length

of claim as indicated by sample group (5 days–3 months, 3–12 months and 12–16 months), union membership (yes/no), living with a partner (yes/no), self-reported diagnosed mood or anxiety disorder prior to injury/illness (yes/no), whether the claimant had an active disagreement with the WSIB about the status of their claim or benefits at the time of interview, and level of pain due to injury/illness at time of interview (10-point scale).

Analyses

Since claimants were sampled according to claim duration, those with longer claim durations were overrepresented and those with shorter claim durations were underrepresented relative to the underlying source population of WSIB claimants. To account for this, the models were weighted by the normalized inverse of the sampling fraction for each of the 3 sampling groups.

A modified Poisson model was used to measure the effect of perceived fairness in case manager interactions on mental health. Given the cross-sectional nature of the data, this model was chosen in place of a logistic regression in order to obtain a prevalence ratio rather than a prevalence odds ratio, the latter being an exaggerated estimate of effect when the outcome is not rare [20]. A modified Poisson model uses a sandwich estimator to avoid the overestimation of standard errors that typically occurs when using a count model with a binary outcome, and to account for clustering due to weighting [21, 22]. Separate models were run for interpersonal and informational justice to avoid multicollinearity between the two scales.

The 2 final weighted robust Poisson regression models were adjusted for age, gender, being born in Canada, claim group (as an indicator of length of claim as well as injury/illness severity and claim complexity), union membership, living with a partner, and pre-injury mental health disorder diagnosis. The possibility that the effect of case manager interactions on the likelihood of having a serious mental illness was different for those with a pre-injury/illness mental health diagnosis was explored through the inclusion of an interaction term in each model.

Due to the cross-sectional nature of the data, current pain and active disagreement with the WSIB could be conceptualized as either confounders or mediators in the relationship between case manager interactions and serious mental illness. That is, a current active disagreement may have been caused by poorer perceived fairness in interactions with the case manager or active disagreements may have caused poorer perceived fairness. Similarly, given the complex relationship between mental health and pain, greater pain may have had an adverse impact on mental health or poor mental health could have exacerbated pain. To explore this, additional models were run adjusting for pain and disagreement

with the WSIB, respectively, to examine the impact on effect estimates obtained from the 2 main models.

Results

Of the 2816 claimants with whom the WSIB established contact, 1674 (59.4%) agreed to share contact information to be interviewed and 1132 (40.1% of claimants reached by the WSIB, 87.8% of claimants successfully contacted and deemed eligible by the study team) participated. Among those who participated, 358 (31.6%) were in sample group 1, 1374 (33.0%) were in sample group 2 and 400 (35.3%) were in sample group 3. A participant flow diagram is available in Fig. 1. Minimal differences were observed between those who participated compared to the original eligible sample. Average benefit duration was slightly longer among those who participated compared to those who did not. However,

when examined within sample (claim duration) groups, this difference was not present (data available from authors upon request).

Of the 1132 participants, 62 (5.5%) were missing information on 1 or more of the covariates included in the analyses and were excluded. An additional 74 claimants (6.5%) self-reported a mental health diagnosis since the time of injury, but did not meet the criteria for a serious mental illness at the 18-month interview using the K6 scale, and were excluded. The overlap between K6-indicated serious mental illness and self-reported physician-diagnosed mental illness since the time of injury/illness is displayed in the supplementary materials. This left a final analytical sample of 996.

Characteristics of the sample are displayed in Table 1. In the unweighted sample, 56.5% were male, the average age was 47.4 (standard deviation 12.8), just over three quarters of respondents were born in Canada, and less than a quarter were not working at the time of interview. After weighting,

Fig. 1 Participant flow diagram

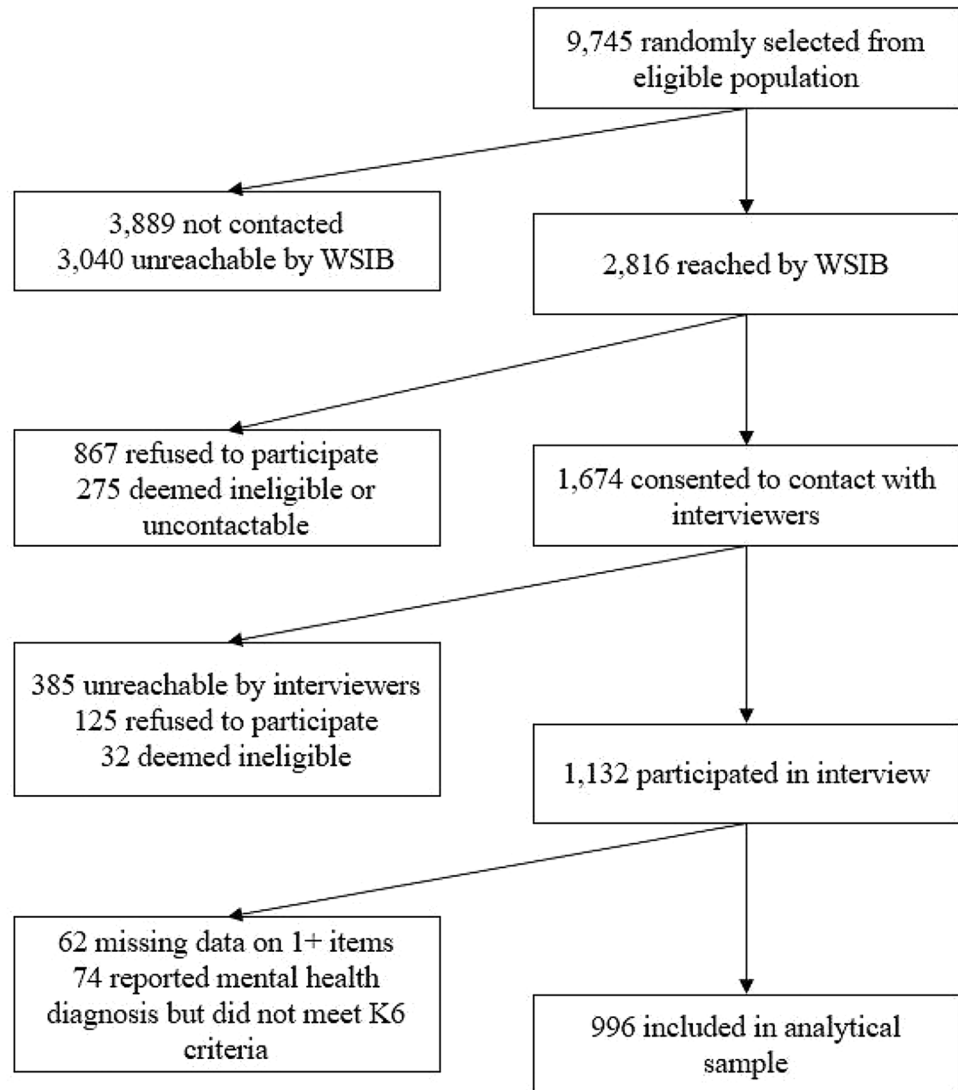


Table 1 Demographic, work and claim characteristics of the cohort

	Unweighted (n=996)	Weighted (n=996)
Gender [n %]		
Men	563 (56.5%)	536 (53.8%)
Women	433 (43.5%)	460 (46.2%)
Age [mean SD]	47.4 (12.8)	46.0 (13.2)
Born in Canada [n %]	771 (77.4%)	758 (76.1%)
Live with partner [n %]	656 (65.9%)	642 (65.5%)
Education [n %]		
Less than high school	301 (30.2%)	259 (26.0%)
Community college/trade school	379 (38.1%)	401 (40.3%)
Some university or above	316 (31.7%)	335 (33.7%)
Working status at time of interview [n %]		
Working with at-injury/illness employer	610 (61.2%)	624 (62.6%)
Working with a different employer	160 (16.1%)	181 (18.2%)
Not working	226 (22.7%)	191 (19.2%)
Union member [n %]	487 (48.9%)	507 (51.0%)
Wage replacement duration (weighting variable) [n %]		
5 days-3 months	314 (31.5%)	781 (78.5%)
3-12 months	334 (33.5%)	128 (12.9%)
12-16 Months	348 (34.9%)	87 (8.7%)
Pre-injury/illness mental health diagnosis [n %]	212 (21.3%)	227 (22.8%)
No contact with case manager [n %]	91 (9.1%)	135 (13.5%)
Case manager who I spoke to most recently...		
Interpersonal justice [n % agree or strongly agree]		
Treated me in a polite manner	758 (84.1%)	759 (88.3%)
Treated me with dignity and respect	723 (80.0%)	732 (85.0%)
Informational justice [n % agree or strongly agree]		
Provided me with the information I needed	630 (70.2%)	662 (77.0%)
Was open and truthful in their communications with me	686 (76.6%)	719 (84.3%)
Explained the process of returning to work carefully and completely	565 (63.9%)	588 (69.6%)
Regularly communicated useful information	522 (57.9%)	546 (63.6%)
Understood my individual needs	540 (60.0%)	582 (68.1%)

the sociodemographic characteristics of the sample did not meaningfully change. Agreement with items in each of the interpersonal and informational justice scales ranged from 57.9% (63.6% weighted) agreeing that their case manager regularly communicated useful information to 84.1% (88.3% weighted) agreeing that their case manager treated them in a polite manner.

With respect to the derived informational justice variable, 91 claimants (9.1% unweighted, 13.5% weighted) reported no case manager, 301 (30.0% unweighted, 34.9% weighted) had a mean score of < 2 indicating high perceptions of informational justice, 465 (46.4% unweighted, 42.9% weighted) had a mean score of 2-3 indicating moderate perceptions of informational justice and 139 (14.4% unweighted, 8.6% weighted) had a mean score of 4-5 indicating low perceptions of informational justice. On the interpersonal scale, 374 (37.6% unweighted, 42.7% weighted) had a mean score

of < 2, 439 (44.1% unweighted, 36.6% weighted) had a mean score of 2-3, and 92 (9.2% unweighted, 7.2% weighted) had a mean score of 4-5. In total, 165 (16.6% unweighted, 15.5% weighted) claimants met the K6 criteria for a serious mental illness at the time of interview. Among this group, 91 individuals (55%) reported accessing a physician or other professional for their mental health in the 30 days prior to interview, and 89 (54%) had received an active mental health diagnosis either pre (n = 24, 15%) or post- (n = 65, 39%) injury/illness.

Results from the weighted modified Poisson regression model are available in Table 2. Following adjustment for confounders, there were 2.58 (95% confidence interval [CI] 1.30-5.10) times more cases of serious mental illness among claimants with a mean score of 4-5 on the informational scale (indicating lower perceived justice) compared to those with a mean score of < 2. There were 1.15 (95% CI

Table 2 Weighted modified Poisson regression model effect estimates for the effect of case manager interactions on the likelihood of experiencing a serious mental illness at 18 months (higher score = lower perceived justice)

	Interpersonal justice		Informational justice	
	PR ^a	95% CI	PR ^a	95% CI
No case manager	0.92	0.36–2.36	0.68	0.27–1.74
Mean score < 2	1.00 (ref)		1.00 (ref)	
Mean score 2–3	2.01	1.18–3.44	1.15	0.69–1.94
Mean score 4–5	3.57	1.81–7.06	2.58	1.30–5.10

^aAdjusted for gender, age, education, immigrant status, sample group, union membership, live-in partner, pre-injury/illness mental health diagnosis

PR prevalence ratio

0.69–1.94) times more cases of serious mental illness among claimants with a mean score of 2–3 compared to those with a mean score < 2, although this result was not statistically significant. On the interpersonal scale, there were 3.57 (95% CI 1.81–7.06) times more cases of serious mental illness among those with a mean score of 4–5, and 2.01 (95% CI 1.18–3.44) times more cases among those with those with a mean score of 2–3 compared to those with a mean score of < 2. There was no difference in the prevalence of serious mental illness among those with no case manager compared to those with a score of < 2 on the interpersonal or informational justice scales. A pre-injury/illness mental health diagnosis was examined as a potential effect modifier of the effect of case manager interactions on the likelihood of experiencing a serious mental illness at 18-months. However, due to small sample sizes, results were inconclusive.

Secondary analyses adjusting for pain and active disagreement with the WSIB, individually and together, attenuated the association between interpersonal and informational justice and serious mental illness. The results from these analyses are available in the supplementary materials.

Discussion

Given the high prevalence of mental illness following physical workplace injuries, it is vital to understand how modifiable elements of the workers' compensation system may be contributing to poor mental health. This study highlighted one potential contributor to poor mental illness among claimants; poor perceived interactions with case managers. We found that workers' compensation claimants in Ontario, Canada who reported poorer interactions with their claim case manager had a higher prevalence of serious mental illness 18-months following their injury/illness.

This study builds on previous work conducted in Victoria, Australia, which similarly found that adverse case manager

interactions were linked to poorer subsequent mental health, by highlighting the presence of this relationship in a different workers' compensation system. In addition, by measuring and adjusting for a pre-injury/illness mental health diagnosis, this study is the first to establish a link between case manager communication and serious mental illness independent of poor pre-injury/illness mental health [13, 23].

This finding has potential implications for the handling of workers' compensation claims. Around 40% of claimants reported that they did not receive regular, useful information from their case manager, indicating a target area for improvement in the communication between case managers and claimants. Further, while a high proportion reported that their case manager treated them with politeness, dignity, and respect, serious mental illnesses were 3.6 times more common at 18 months post-injury/illness among those who did not. Therefore, both the quantity and quality of information provided, and the manner of interactions appear to be important.

Notably, overall perceptions of fairness in case manager interactions were poorer in this sample, compared to those reported among workers' compensation claimants in Victoria, Australia [13]. This could reflect the fact that respondents were asked about their interactions 18 months following their injury, suggesting that longer-term reflections are generally poorer, or it could reflect tangible differences between the two compensation systems.

Importantly, unlike factors such as disagreement with the outcome of a claim, case manager interactions are modifiable, for example through policies and training programs. Given the impact of mental illness on recovery and return-to-work for claimants, working to improve case manager-claimant interactions could be a good investment for workers' compensation systems.

Some of the strengths of this study include our ability to account for pre-injury mental health diagnoses, our use of a validated screening scale to measure mental illness rather than relying on self-reported diagnoses, our sample design to ensure that those with longer-term, more complex claims were represented, and our use of a modified Poisson model in order to avoid overestimation of effects when using an odds ratio.

However, there are also limitations. Given the interview was conducted at 18 months, mental illnesses that resolved prior to the interview may have been missed. This may explain why the prevalence of mental illness in this sample was lower than that found in prior studies of WSIB claimants [7]. In addition, due to the low sensitivity of the K6 screening scale (36%), some cases of serious mental illness within the sample may have been missed. As a result, this study likely only captures the most serious and persistent cases of mental illness and can speak less to the determinants of shorter-term or less severe mental illnesses. While

the participation rate among those eligible appears to be low (40.1%), an assessment revealed that the only meaningful difference between the study sample and the original random sample was a slightly longer length of benefit duration, an artefact of the sampling design of this study. This was accounted for by weighting the models by the inverse of the sampling fraction for each group defined by duration of wage replacement. Therefore, the study sample is considered to be representative of the claimant population.

Another limitation of this study is that it is cross-sectional, meaning both mental health and perceptions of fairness in case manager interactions are measured at the same time. Experiencing a mental illness may impact upon communication and social skills, and may cause strain in relationships, therefore there is a potential for reverse causality [24]. Yet, the measure of case manager interactions in this study was retrospective, for the majority of claimants in the weighted sample, their cases had closed and case manager interactions will have ceased over a year prior to the interview at which their mental health was assessed. Further, pre-injury/illness mental illness diagnoses were adjusted for in the analyses to account for the effect of pre-existing mental health problems on subsequent case manager interactions. There remains a possibility that experiencing a mental illness at the time of the interview may have flavored memories of case manager interactions. However, prior work conducted by the research team among a cohort of Australian workers' compensation claimants established that the exposure measure of perceived fairness in case manager interactions is distinct from the screening scale for mental illness using factor analysis, indicating these measures are capturing different concepts [13].

Further, while we believe we have captured the most important confounders of the relationship of interest, the cross-sectional nature of the data also means we lack information on certain pre-injury work characteristics that could influence the relationship between case manager interactions and subsequent mental health. Secondary analyses did reveal that adjusting for pain and disagreements with the WSIB, rather than treating them as mediators, attenuated the relationship between perceptions of fairness in the information provided by case managers and mental illness. However, due to the cross-sectional nature of the study, it is unclear whether these factors are acting as mediators or confounders of the relationship. This study also lacked power to examine the potential for pre-injury mental illness to be acting as an effect modifier of the observed relationship, therefore the observed associations may differ for those with versus without a pre-injury mental illness.

In conclusion, this study provides support to previous work on the negative impact of poor interactions with claims case managers on mental health following a workplace injury or illness. Future research using longitudinal designs

to ensure correct temporality in the measurement of case manager interactions, mental illness, and the confounders of this relationship, are required in order to further substantiate this finding. This work has important implications for the management of workers' compensation claims, both in Ontario as well as in other jurisdictions, highlighting the importance of informative, open, polite and fair communication with workers' compensation claimants in ensuring timely recovery and return-to-work.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s10926-021-09974-7>.

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Data Availability The datasets analyzed during the current study are not publicly available but are available from the corresponding author on reasonable request.

Declarations

Conflict of interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

Ethical Standards This study was approved by the University of Toronto Health Sciences Research Ethics Board and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments. All participants gave their informed consent prior to their inclusion in the study.

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