

Original Investigation

Relationship Between Stressfulness of Claiming for Injury Compensation and Long-term Recovery

A Prospective Cohort Study

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IMPORTANCE Each year, millions of persons worldwide seek compensation for transport accident and workplace injuries. Previous research suggests that these claimants have worse long-term health outcomes than persons whose injuries fall outside compensation schemes. However, existing studies have substantial methodological weaknesses and have not identified which aspects of the claiming experience may drive these effects.

OBJECTIVE To determine aspects of claims processes that claimants to transport accident and workers' compensation schemes find stressful and whether such stressful experiences are associated with poorer long-term recovery.

DESIGN, SETTING, AND PARTICIPANTS Prospective cohort study of a random sample of 1010 patients hospitalized in 3 Australian states for injuries from 2004 through 2006. At 6-year follow-up, we interviewed 332 participants who had claimed compensation from transport accident and workers' compensation schemes ("claimants") to determine which aspects of the claiming experience they found stressful. We used multivariable regression analysis to test for associations between compensation-related stress and health status at 6 years, adjusting for baseline determinants of long-term health status and predisposition to stressful experiences (via propensity scores).

MAIN OUTCOMES AND MEASURES Disability, quality of life, anxiety, and depression.

RESULTS Among claimants, 33.9% reported high levels of stress associated with understanding what they needed to do for their claim; 30.4%, with claim delays; 26.9%, with the number of medical assessments; and 26.1%, with the amount of compensation they received. Six years after their injury, claimants who reported high levels of stress had significantly higher levels of disability (+6.94 points, World Health Organization Disability Assessment Schedule sum score), anxiety and depression (+1.89 points and +2.61 points, respectively, Hospital Anxiety and Depression Scale), and lower quality of life (−0.73 points, World Health Organization Quality of Life instrument, overall item), compared with other claimants. Adjusting for claimants' vulnerability to stress attenuated the strength of these associations, but most remained strong and statistically significant.

CONCLUSIONS AND RELEVANCE Many claimants experience high levels of stress from engaging with injury compensation schemes, and this experience is positively correlated with poor long-term recovery. Intervening early to boost resilience among those at risk of stressful claims experiences and redesigning compensation processes to reduce their stressfulness may improve recovery and save money.

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Injury is an important contributor to the burden of disease, accounting for 10% of deaths and 11% of disability-adjusted life years globally in 2010.^{1,2} A substantial proportion of nonfatal injuries occur on the road or in the workplace.^{2,3} In developed and middle-income countries, persons who sustain injuries in these settings are often eligible to claim monetary benefits from injury compensation schemes. Although a central goal of such schemes is to help return injured persons to work and health, there are growing concerns that they may have the opposite effect.^{4,5}

By comparing the postinjury health status of patients who claim compensation with that of patients who do not claim, more than 100 studies have concluded that recovery trajectories are worse among claimants.⁶ Other studies have linked receipt of certain benefits from compensation schemes to slower recoveries.^{7,8} Commentators have posited a causal relationship between “exposure” to compensation systems and ill health.⁹ One explanation for this effect focuses on claimants’ choices and behaviors.¹⁰ Another points to stressful aspects of the claims process itself, including adversarialism and clinical scrutiny, as independent determinants of poor health outcomes.¹¹

The nature, extent, and cause of compensation-related health effects remain unclear, largely as a result of fundamental limitations in the extant research.^{9,12-14} This study was designed to avoid these limitations. We observed a cohort of injured patients for 6 years and then interviewed those who had pursued claims in transport accident and workers’ compensation schemes about their experience. Our analysis investigated compensation-related health effects *within* this sample of claimants. The study aims were to determine which aspects of the process claimants found stressful and whether stressful experiences were associated with poorer long-term recovery.

Methods

This analysis was nested within the Australian Injury Vulnerability Study (IVS), a longitudinal, hospital inception cohort study of the mental and physical health outcomes of injured patients in Australia. The IVS methodology has been described previously.¹⁵⁻¹⁷

IVS Participants

The IVS participants consisted of injured patients admitted to 1 of 4 major trauma hospitals in 3 Australian states (Victoria, New South Wales, South Australia) between April 2004 and February 2006. A random sample of 1590 patients was selected from among English-speaking patients aged 16 to 70 years with injuries severe enough to warrant hospitalization lasting at least 24 hours. Patients with moderate or severe traumatic brain injury were excluded, as were those who were assessed by medical staff as currently psychotic or actively suicidal. The study was approved by human research ethics committees at the University of Melbourne and each of the hospitals.

A total of 1010 patients provided written consent to participate and completed an intake assessment questionnaire im-

mediately prior to discharge. Patients who declined to participate at baseline ($n = 580$) did not differ significantly from participants in age, sex, length of hospitalization, or injury severity.

The cohort was followed up for additional measures at 3, 12, 24, and 72 months. The 6-year follow-up was undertaken between January 2011 and May 2012; 616 (61%) of the original IVS cohort participated. Participants who completed the 6-year assessment did not differ significantly from baseline participants who dropped out ($n = 394$) in terms of sex, the presence of mild traumatic brain injury,¹⁸ length of hospitalization, or injury severity; however, 6-year completers were slightly older than noncompleters (mean age, 39.5 vs 36.1 years; $P < .001$).

Health Status Measures

Injury Vulnerability Study investigators extracted participants’ demographic and injury-related information from hospital records. Preinjury psychiatric history was assessed using the Mini International Neuropsychiatric Interview, version 5.5,¹⁹ and converted to a dichotomous variable indicating any major depressive episode, posttraumatic stress disorder (PTSD), social phobia, panic disorder, generalized anxiety disorder, or substance use disorder. Severity of PTSD symptoms was assessed during hospitalization and at each follow-up using the Clinician-Administered PTSD Scale.²⁰ Participants’ disability (preinjury, follow-ups) was measured using the 12-item World Health Organization Disability Assessment Schedule (WHODAS) 2.0.²¹ We used the simple sum scoring method²² to create a scale ranging from 0 (no disability) to 48 (complete disability).

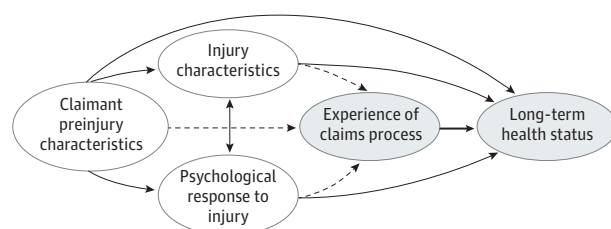
Severity of symptoms of anxiety and depression (during hospitalization, follow-ups) was assessed using the Hospital Anxiety and Depression Scale (HADS), which scores these disorders on scales ranging from 0 to 21, with higher scores indicating higher severity.^{23,24} Quality of life (preinjury, follow-ups) was measured using the overall item from the World Health Organization Quality of Life (Brief Version) instrument (WHOQOL), which asks, “How would you rate your quality of life in the last two weeks?”²⁵ Responses range from 1 (very poor) to 5 (very good).

Compensation Schemes and Claims Experience

Our analysis focused on IVS participants who pursued a compensation claim with a transport accident or workers’ compensation scheme in Victoria, New South Wales, or South Australia. A description of the general structure of these schemes is provided in the eAppendix (in Supplement).

To collect information about the experiences of claimants, we developed the Claim Experience Survey. This survey was designed to elicit information about elements of the claiming experience that claimants found stressful. We focused on the construct of “stress” because it is readily understandable in a general survey, is frequently discussed as a negative reaction to the claims experience in the literature on compensation-related health effects,^{9,10} and has a plausible biological relationship with health.²⁶ Claimants were asked whether they found each of the 9 elements of the claims experience

Figure 1. Determinants of Long-term Health Outcomes Following Injury



The boldface arrow indicates the relationship of interest. Nonbold solid arrows indicate baseline predictors of long-term health outcomes. Dashed arrows indicate predictors of stressful claims experiences.

stressful, and those who responded affirmatively were asked to rate the element, or “stressor,” on a 5-point scale ranging from 1 (“a little stressful”) to 5 (“extremely stressful”). For analytical purposes, we dichotomized this variable into “no or low stress” (negative response to the stressor question or positive response followed by scores 1-2) and “high stress” (positive response followed by scores 3-5).

We drew the stressors from literature in the fields of organizational and procedural justice,²⁷⁻³⁰ and qualitative investigations of claimants’ experiences of claiming compensation.³¹⁻³³ Some questions were taken directly from instruments developed and validated in previous studies.^{28,30} We piloted the survey for face validity, comprehension, and feasibility and then administered it as part of the 6-year IVS follow-up interview.

Claimants’ Vulnerability to Stress

A variety of factors other than the stressfulness of engaging with the claims process determine recovery from injury, including claimants’ preinjury characteristics (eg, age, psychiatric history), characteristics of the injury itself (eg, severity), and claimants’ psychological response to the injury. Our analyses of the relationship between compensation-related stress and recovery adjusted for a range of such baseline factors (Figure 1). However, these same factors may also affect claimants’ psychological response to the claims process. To adjust our analyses for such “vulnerability” factors, we used a propensity score method.

Propensity scores were obtained by regressing claimants’ responses to the stressor questions on the following baseline variables: demographic characteristics (age, income, sex, marital status, education); preinjury health status (psychiatric history, disability); injury (Injury Severity Score [ISS],³⁴ length of hospitalization, presence of a mild traumatic brain injury, discharge to rehabilitation or home); psychological response to the injury (anxiety, depression, PTSD severity in hospital and at 3 months); and hospital and compensation scheme. These equations produced scores ranging from 0 to 1 for each claimant and each stressor-health outcome combination.

Statistical Analyses

We used multivariable linear regression to test for associations between compensation-related stress and long-term health status. The predictors of interest were claimants’ responses to the stressor questions (high stress vs no or low stress). The outcomes of interest were disability, overall quality of life, anxiety, and depression—all measured at 6 years after injury.

Our primary analyses consisted of models for each combination of the stressors and outcomes. These models adjusted for claimant age and income, ISS, duration of hospitalization, sex, preinjury psychiatric history, compensation scheme, and the baseline values of the relevant health status measure. The baseline measures for disability and quality of life pertained to claimants’ health in the month prior to their injury; the baseline measures for anxiety and depression pertained to claimants’ health in the acute postinjury period. Our secondary analyses involved rerunning each model with the propensity score as an additional covariate.

Finally, we conducted marginal effects analyses to examine the “spread” of claimants’ health status at 6 years, across varying levels of compensation-related stress. We summed each claimant’s ratings on the stressor questions to construct a simple aggregate measure of claim-related stress. We used this aggregate measure as the predictor of interest in models with the same specifications as our secondary analyses (ie, including the propensity score). These models were used to predict the health status of claimants at the 10th (lower), 50th (median), and 90th (higher) percentiles of stress. All analyses were conducted using Stata SE software, version 11.

Results

Two-thirds (409 of 616) of IVS participants interviewed 6 years after their injury had made claims for compensation. The claims were pursued with transport accident schemes (257 claimants), workers’ compensation schemes (82), personal accident or income protection insurers (41), crime victim compensation funds (21), public liability insurers (6), and unknown entities (2). All results reported hereafter pertain to the 332 claimants (54% of 6-year participants) who pursued transport accident and workers’ compensation claims and responded to the Claim Experience Survey. Assuming that an equivalent proportion of the 1010 IVS participants at baseline went on to become claimants to the schemes, approximately 61% (332 of 544) of the subgroup of interest participated at 6 years.

Sample Characteristics

Claimants had a mean (SD) age at hospitalization of 39 (13) years, and 71% were men (Table 1). Their median (interquartile range [IQR]) ISS was 10 (8-16), which represents moderate severity. Their median (IQR) length of hospitalization was 8.5 (5-15) days. Forty-five percent of claimants sustained mild trau-

Table 1. Claimants' Preinjury, Injury, and Claim Characteristics

Characteristic	Claimants (N = 332)
Male, No. (%)	71
Age at admission, mean (SD), y	39 (13)
Partnered at admission (married or cohabiting), %	53
Education (completed year 12), %	48
Working prior to injury, %	94
Preinjury health status	
Disability, mean (SD) ^a	2.1 (3.6)
Overall quality of life, mean (SD) ^b	4.4 (0.7)
History of psychiatric disorder, % ^c	59
Injury characteristics	
Injury Severity Score, median (IQR)	10 (8-16)
Intensive care unit admission, %	16
Presence of mild traumatic brain injury, %	45
Discharge to rehabilitation facility (vs home), %	30
Psychiatric symptoms 1 week after injury, mean (SD)	
Anxiety score ^d	4.4 (3.7)
Depression score ^d	4.5 (3.6)
PTSD severity score ^e	15.8 (13.5)
Health status at 6 y, mean (SD)	
Disability ^a	7.5 (7.7)
Overall quality of life ^b	4.0 (0.9)
Anxiety score ^d	6.1 (4.5)
Depression score ^d	4.2 (4.2)
Compensation scheme, No. (%)	
Transport accident - Victoria	61
Workers' compensation - Victoria	11
Transport accident - South Australia	9
Workers' compensation - New South Wales	7
Transport accident - New South Wales	5
Workers' compensation - South Australia	5
Another transport accident or workers' compensation scheme	2
Claim complete at 6 y, %	87

Abbreviations: IQR, interquartile range; PTSD, posttraumatic stress disorder.

^a 12-Item World Health Organization Disability Assessment Schedule 2.0 (sum scoring method, scale 0 to 48).

^b Single item, scale 1 (very poor) to 5 (very good).

^c Mini International Neuropsychiatric Interview, version 5.5.

^d Hospital Anxiety and Depression Scale.

^e Clinician Administered PTSD Scale.

matic brain injury. Nearly all claimants (94%) were in paid employment prior to their injury.

Approximately three-quarters of claimants had filed claims in the transport accident scheme (61%) or workers' compensation scheme (11%) in Victoria. Eighty-seven percent of claimants reported that their claim was complete at 6 years after injury (excluding any residual claims for health and medical costs, an ongoing benefit in some schemes).

Stressfulness of Claims Experience

The aspects of the claims experience most often reported as highly stressful by claimants were understanding what they

Table 2. Claim Experience Survey: Stressor Questions and Results

Claim Experience Stressors	Stressed Group ^a	
Was this aspect of your claim a source of stress? If so, how stressful was it (scale, 1-5)?	Claimants, %	Score, Mean (SD)
1. Understanding what you needed to do for your claim	33.9	3.9 (0.8)
2. The amount of time the compensation organization took to deal with your claim	30.4	4.1 (0.9)
3. The number of medical assessments or examinations you went through for your claim	26.9	3.9 (0.8)
4. The amount of compensation you received	26.1	4.0 (0.9)
5. The fairness with which the compensation organization dealt with your claim	24.8	4.0 (0.9)
6. Getting the compensation organization to listen to what you had to say	22.1	4.3 (0.8)
7. The level of respect and dignity the compensation organization treated you with as a person	18.3	3.8 (0.9)
8. Negative attitudes from doctors or other health professionals because of your claim	7.9	3.7 (0.8)
9. Negative attitudes from friends, family or colleagues because of your claim	6.9	4.0 (0.8)

^a Score ≥ 3 out of 5.

needed to do for their claim (33.9%) and the amount of time that the scheme took to deal with their claim (30.4%) (Table 2). Approximately one-quarter of claimants reported high levels of stress associated with the number of medical assessments (26.9%) and with the amount of compensation that they eventually received (26.1%). The aspects of the claims experience least often reported as highly stressful by claimants were negative attitudes from family, friends, and colleagues (6.9%) and negative attitudes from health care professionals (7.9%).

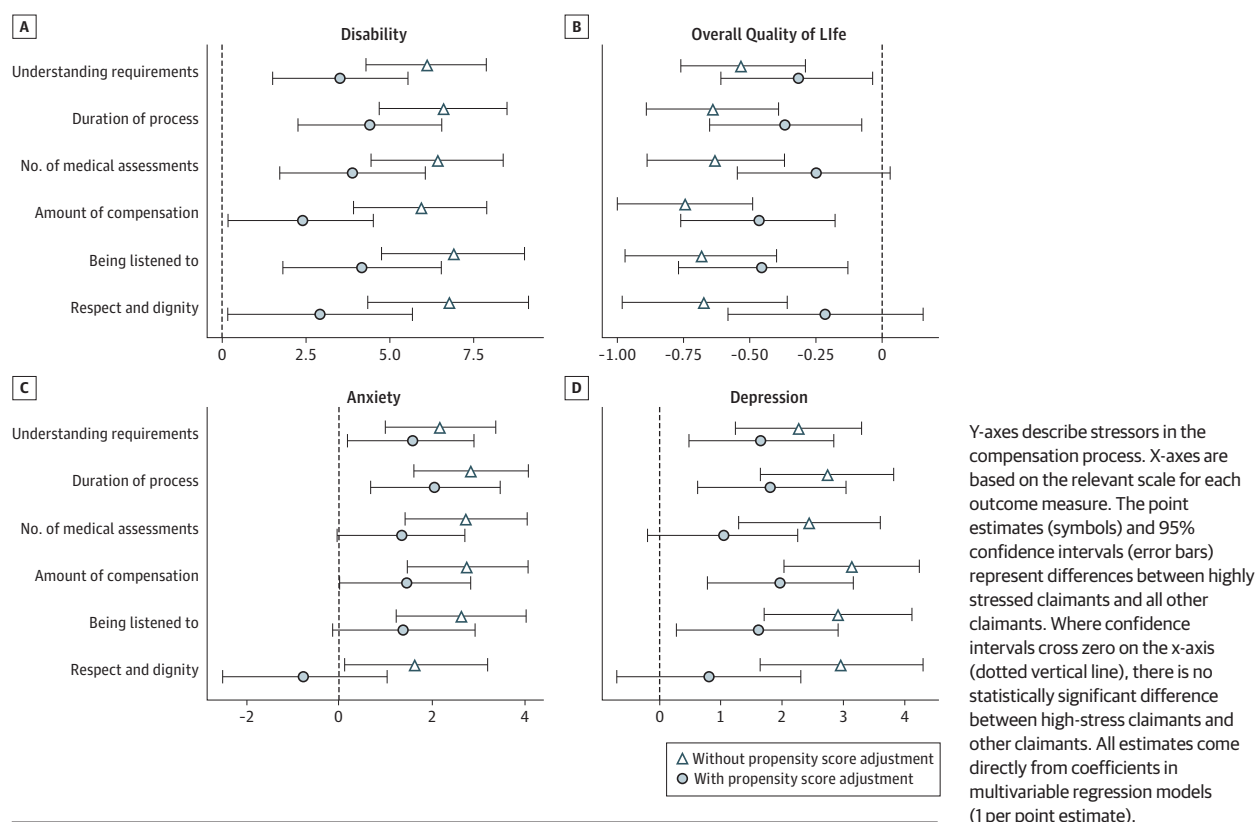
Responses to the fairness question were highly collinear with responses to other stressor questions (specifically, those regarding being listened to, and being treated with respect and dignity). We therefore excluded this question from further analyses. We also excluded the 2 questions regarding negative attitudes because so few respondents identified them as a source of high levels of stress.

The 6 stress items used in our analyses exhibited strong internal consistency (Cronbach α , 0.87). Confirmatory factor analysis indicated that the items grouped well into a single factor (comparative fit index, 0.98; Tucker-Lewis index, 0.96; root mean squared error of approximation, 0.08; standardized root mean squared residual, 0.03; coefficient of determination, 0.88).

Multivariable Analyses

Figure 2 shows results from analyses estimating the relationship between the stressfulness of claimants' compensation experience and their 6-year health status. To guide interpretation of this figure, consider the results associated with the most commonly identified stressor, "understanding what you needed to do for your claim." Six years after sustaining their injuries, claimants who reported high levels of stress from this source averaged significantly higher levels of disability (WHODAS β , 6.06 [95% CI, 4.27 to 7.87]), lower quality of life (WHOQOL, overall item β , -0.53 [95% CI, -0.76 to -0.29]), and higher levels of anxiety (HADS β ,

Figure 2. Health Status Differences Between Stressed and Nonstressed Claimants at 6 Years After Injury



2.19 [95% CI, 1.00 to 3.39]) and depression (HADS β , 2.26 [95% CI, 1.24 to 3.28]), compared with claimants who reported not experiencing high levels of stress from this factor (triangles, Figure 2).

Inclusion of the propensity score attenuated all observed effects (circles, Figure 2). For example, claimants highly stressed by understanding what they needed to do for their claim still averaged significantly higher levels of disability (WHODAS β , 3.50 [95% CI, 1.49 to 5.51]), lower quality of life (WHOQOL, overall item β , -0.32 [95% CI, -0.61 to -0.04]), and higher levels of anxiety (HADS β , 1.55 [95% CI, 0.19 to 2.92]) and depression (HADS β , 1.66 [95% CI, 0.48 to 2.84]), but these effects were smaller than in the corresponding models without the propensity score.

In sum, every one of the 24 models that did not include the propensity score as a covariate showed a significant negative association between the stressfulness of the claim experience and health status 6 years after injury. After inclusion of the propensity score, 17 of the 24 models showed a significant negative association.

Marginal Effects Analysis

The aggregated stress measures, which were calculated by summing claimants' scores across the 6 stressor questions, ranged widely (median [IQR], 4 [0-12]). There were large differences in claimants' 6-year health status across this range (Figure 3). For example, the estimated WHODAS score of the highest-stress claimants (90th percentile) was 11.63, 6.94 points higher

than that of claimants reporting no or low stress. Compared with population norms, the disability scores associated with the 90th percentile group fall into the highest decile of WHODAS scores in the general Australian population.²²

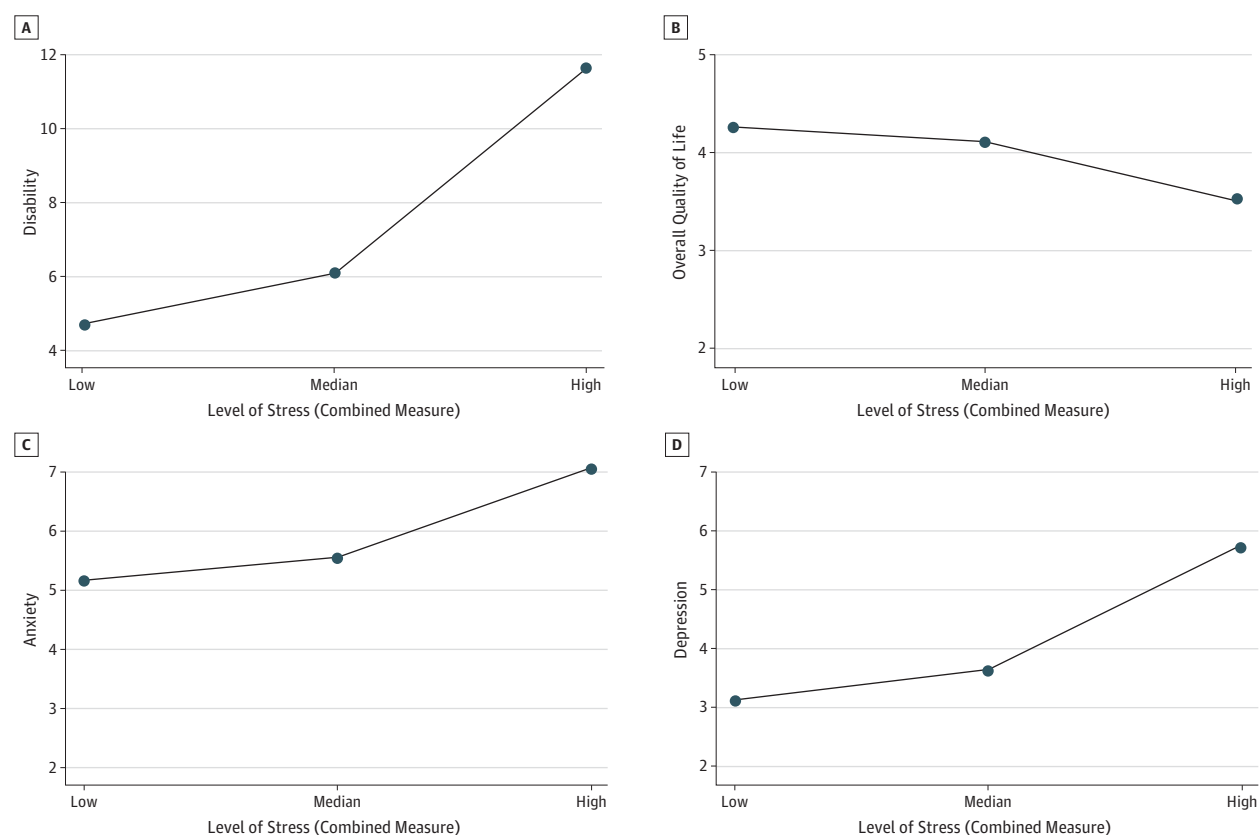
Discussion

This cohort study of claimants to transport accident and workers' compensation schemes in 3 Australian states found that stress related to the experience of making a claim was prevalent. Claimants with the most stressful experiences had relatively poor long-term recovery. Adjusting for clinical and demographic factors that may have predisposed claimants to experiencing the claims process as stressful reduced the strength of the association but did not eliminate it.

Many qualitative studies of claimants' experiences with compensation systems have identified the stressful nature of the claims process as a contributor to enduring ill health.^{10,11,31-33} However, interview-based research of this kind generally involves small samples, lacks a comparison group, and cannot estimate population-level effects.¹⁰ Quantitative research on organizational justice has demonstrated relationships between workers' experiences of injustice in occupational settings and ill health.^{27,35-37}

Studies that have examined the health effects of compensation systems quantitatively are beset with methodological problems.^{9,12-14,38} Three problems stand out. First, and most

Figure 3. Predicted Health Status for Individuals With Low, Median, and High Levels of Claim-Related Stress



The combined stress measure is the sum of the 6 stressors, each scored from 0 to 5. Low, median, and high are defined as the 10th, 50th, and 90th percentiles of the combined stress measure. A, Disability, measured on a scale of 0 to 48;

B, overall quality of life, measured on a scale of 1 to 5; C, anxiety, measured on a scale of 0 to 21; D, depression, measured on a scale of 0 to 21.

importantly, most of these studies estimate compensation-related health effects by comparing the health status of patients whose injuries were the subject of compensation claims with the health status of patients whose injuries were not. In some of these studies, the nonclaimants are persons whose injuries suggest that they were eligible to file claims but they did not; in other studies, the comparison group consists of persons with injuries or diseases that fall outside the ambit of compensation schemes. There is wide scope for selection biases to contaminate these comparisons.¹² Patients who choose not to make a claim may be more resilient, and their injuries may be less severe and have lesser life impacts.³⁸ Injuries that fall outside compensation schemes may not engender the kind of shock, trauma, and long-term sequelae that injuries covered by compensation schemes do. This is true even for injuries with similar clinical features, for example, a back injury from playing recreational tennis compared with one sustained in an automobile crash or a fall at work.

Second, previous studies have typically measured outcomes within 1 year of injury, and few have measured beyond 2 years.³⁹ This is too soon. Compensation claims often take years to resolve, and longer cases are more likely to involve disputes and difficulties. Thus, in studies with short follow-up periods, closed claims will be biased toward those that are rela-

tively straightforward, and among open claims the full health effects of the claimant's compensation experience may not yet have materialized.

Finally, all but a few of the previous studies have used cross-sectional data on health outcomes. Without baseline measures of claimants' health status, recovery cannot be examined accurately. Moreover, it is not possible to adjust for the influence that such baseline factors may have on both the claimants' compensation experience and their long-term health status.

If health effects from compensation processes exist, they should be stronger among claimants who have more stressful experiences in pursuing compensation. Our analytical approach was designed to test for such variation. In this way, we avoided the methodological problems associated with the standard claimant vs nonclaimant comparisons. We also extended the literature in this area by tracking claimants over a 6-year period and linking adverse health effects to particular aspects of the claiming experience.

Nonetheless, our study has its own limitations. First, the sample is limited to claimants hospitalized for at least 24 hours after injury; they are likely to be more seriously injured than other claimants. The extent to which the study findings are generalizable to nonhospitalized claimants is unknown. Second,

our findings may have been affected by sample attrition or non-responses in the IVS; however, because the analyses focused on within-group differences, they should be less vulnerable to biases from these sources.

Third, study participants may have inaccurately recalled their preinjury health.⁴⁰ This possibility was minimized by the conduct of the acute assessments soon after injury occurrence (median [IQR], 5 [3-8] days). Moreover, for such recall issues to bias our estimates of the relationship of interest, they would need to have varied systematically with responses to the stressor questions, which is unlikely. Fourth, although our analyses controlled for many of the recognized and important predictors of long-term health outcomes after injury, we did not include some (eg, specific comorbidities,⁴¹⁻⁴⁴ body region injured,⁴¹⁻⁴⁴ regular smoking,⁴⁴ and intensive care unit days).⁴³ It is possible that 1 or more omitted variables may have confounded our estimates. Finally, our analyses show associations, not cause-and-effect relationships.

Some degree of claimant stress in the compensation experience may be unavoidable. To determine eligibility and levels of compensation, schemes must collect, investigate, and test evidence. This is their core business. However, our findings highlight parts of the system that appear especially prone to inducing the types of stresses among claimants that may hinder recovery.

Two of the largest negative health effects that we observed were associated with problems that claimants had in understanding what the claims process required of them and the stress that claimants linked to the time taken to deal with their claims. Population-level studies of the experience of legal problems demonstrate that community members often have limited knowledge about their legal rights and the steps needed to make a claim.⁴⁵⁻⁴⁸ Enhancing claimants' access to information about the claims process and benefits to which they may be entitled could reduce stress among claimants. Our finding of an association between stress from process duration and health outcomes provides added impetus for schemes to strive to minimize delays in their handling of claims.

An innovative feature of our study was use of propensity scores to adjust for claimants' vulnerability to the stresses of making a claim. For every stressor-health outcome combination examined, this adjustment reduced the magnitude of the association; in one-third of the combinations, the association was significant before adjusting for this factor but not after. This finding suggests that analyses of compensation health effects that ignore claimants' predisposition to stress, as all previous studies that we are aware of have done, are likely to exaggerate the size of these effects. Concomitantly, interventions to reduce compensation effects that focus exclusively on determinants connected to compensation processes and not on determinants that are associated with the claimants themselves will tackle only 1 side of the problem. Additional research is needed to investigate the role of vulnerability to stressful claims experiences in slowing claimants' recovery.

Conclusions

Our findings point to 2 potential strategies for improving the recovery of claimants in compensation schemes for personal injury. One approach would focus on redesigning schemes to make them less stressful for claimants. A logical starting point is processes that are both strongly associated with claimant stress and modifiable; in our study, claimants' understanding of what is required and claim duration appear to meet both criteria. Another approach would seek to screen and intervene early with claimants who exhibit characteristics, such as mental health problems, that indicate vulnerability to stressors in the claims process. Stepped-care, early-intervention models, for instance, have shown promise in improving mental health outcomes after injury.⁴⁹ A mix of interventions along these lines may be the best means of ensuring that injury compensation schemes deliver on their founding objective of enhancing recovery rather than impeding it.

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