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ORIGINAL ARTICLE

Does expecting mean achieving? The association between expecting to return to work and recovery in whiplash associated disorders: a population-based prospective cohort study

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Abstract To determine the association between expectations to return to work and self-assessed recovery. Positive expectations predict better outcomes in many health conditions, but to date the relationship between expecting to return to work after traffic-related whiplash-associated disorders and actual recovery has not been reported. We assessed early expectations for return to work in a cohort of 2,335 individuals with traffic-related whiplash injury to the neck. Using multivariable Cox proportional hazard analysis we assessed the association between return to work expectations and self-perceived recovery during the first year following the event. After adjusting for the effects of sociodemographic characteristics, initial pain and symptoms, post-crash mood, prior health status and collision-related factors, those who expected to return to work reported global recovery 42% more quickly than those who did not have positive expectations (HRR = 1.42, 95% CI 1.26–1.60). Knowledge of return to work expectation provides an important prognostic tool to clinicians for recovery.

Keywords Expectations · Recovery · Return-to-work · Whiplash-associated disorders

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Introduction

The public health importance of neck pain cannot be denied, with a recent best evidence synthesis reporting prevalence estimates of between 30 and 50% of the adult population per year [20]. Traffic-related whiplash-associated disorder (WAD) is an important source of neck pain, is common and costly in developed countries, and is an important cause of chronic disability [9, 34, 35]. Moreover, WAD carries the reputation of being a disabling and incurable condition [14], constituting not only a major medical problem but placing an important burden on the health care systems and economies of industrialized countries [19].

Of particular importance to the injured person, their families, the health care system and insurance systems are both health recovery and return to work. However, the concept of recovery holds different meanings amongst individuals [1, 19], and as such, the lack of a uniform definition for recovery has allowed for a variety of indices to assess the clinical course, including return to work. While return to work is not identical with health recovery,

it is an important surrogate measure of recovery, and timely return to work has both financial and personal implications [8, 16, 19]. However, it must be recognized that, as an outcome, return to work may not reflect other aspects of recovery since it may underestimate the true duration of disability as some individuals return to work prior to feeling like they are "recovered" [11, 15, 19]. This may lead to increased frequency of workers becoming re-injured, re-opening claims, and subsequently adding additional economic burden to health/insurance systems. Therefore, it becomes important to know whether there is a relationship between those who predict they will be able to return to work and how that relates to being "recovered."

Health expectations have been demonstrated to predict actual health outcomes in a number of medical conditions, such as low back pain, myocardial infarction and weight loss programs [28]. Two recent studies have also reported a positive relationship between expectations for recovery and actual recovery in WAD [5, 21]. Also, studies included in a recent systematic review report that there is strong evidence that recovery expectation is one of the most consistent predictors of return to work across studies for low back pain [12, 18, 26, 37]. What remains uncertain, yet of vital clinical utility, is whether those who expect to return to work also experience health recovery more quickly than those who do not expect to return to work.

Our study objective was to examine the association between positive return to work expectations and self-perceived global recovery following a traffic collision and resulting WAD. We hypothesize that those who have a positive expectation for return to work will have a recovery rate that is faster than those who do not.

Materials and methods

Participants and procedures

The study included all eligible traffic-injury claimants in Saskatchewan, a Canadian province with approximately one million residents. Complete ascertainment of claimants was possible because Saskatchewan has a single traffic-injury insurer, Saskatchewan Government Insurance (SGI); and persons seeking health care for traffic injuries are required to make a claim with SGI. At the time of this study, the insurance system was a "no fault" system, which means that insurance benefits (e.g., payment for treatment, income replacement benefits, etc.) are available to the injured individual regardless of fault for the collision. Thus, the cohort captured all individuals involved in a collision who required treatment, income replacement or other benefits.

All insurance claimants completed the SGI Application for Benefits form, and this administrative data formed our baseline information. This questionnaire provided self-reported information on demographic and socioeconomic characteristics, data on the crash, injury-related symptoms, work status, expectations for recovery and for return to work and psychological mood. Those claimants who consented to be followed were interviewed at 6 weeks, 3, 6, 9 and 12 months after the crash using structured telephone interviews.

Our inclusion criteria for this study were as follows: Saskatchewan residents aged 18 and over, whose traffic injuries were sustained between December 1, 1997 and November 30, 1999 and who made their claim within 42 days of the collision. We did not have access to participants' health files, and used the following operational definition ascertained through self-report to identify those with WAD: being injured in a motor vehicle (rather than as a pedestrian or cyclist); having no more than 2 days of hospitalization following the crash (longer hospitalization would suggest injuries more serious than WAD); and reporting that the crash caused neck pain. We excluded those who could not complete the questionnaire because of serious injuries or serious unrelated health conditions (for example, Alzheimer's disease), or because of insufficient command of the English language. Our cohort does not include those injured in traffic collisions while working, since they are insured under a different insurance system.

Finally, in the current study, in order to assess expectations to return to work, we excluded those who were not employed at the time of the collision, and those who had already returned to their usual employment prior to completing the application for benefits.

Measures

Expectations to return to work

This was assessed by a single question at baseline: "Do you think that you will recover enough to return to your usual job?": with the response options of "yes"; "no"; "don't know". Similar questions to assess expectation to return to work have been used in previous studies [8, 31].

Recovery outcome

Self-perceived global recovery assessed in follow-up interviews at 6 weeks, and at 3, 6, 9 and 12 months by the question "How well do you feel you are recovering from your injuries? Are you …all better (cured)? …feeling quite a bit of improvement? …feeling some improvement? …feeling no improvement? …getting a little worse? …getting much worse?" Participants were defined as

recovered when they reported feeling "all better (cured)" or "feeling quite a bit of improvement" with no worsening symptoms in the subsequent follow-up. This global self-assessment of recovery is consistent with research emphasizing the importance of using patient-centered perspectives in assessing "recovery" in injuries [1]. Those individuals reporting having "recovered" using the above criteria have been previously reported to have much lower pain intensity and disability than those who did not report themselves to be "recovered" [6].

Potential confounders

Potential confounders of the relationship between expectations to return to work and subsequent self-reported recovery were measured at baseline on the claim form and included age; gender; education; marital status; income; percentage of body in pain; initial neck pain intensity; post-collision headache or lower back symptoms; post-collision depressive symptomatology; current (post-injury) health; prior history of neck pain; prior history of musculoskeletal problems; general health during the month prior to collision; job satisfaction; employment status (part-time, full-time, etc.); direction of impact; position in vehicle; and number of days from collision to completing claim form.

Number of days from the collision to completing the claim form was included as a potential confounder because it was possible that those who completed their claim form quickly after the crash may have systematically different expectations for return to work than those who completed their claim form later. For example, those who completed their claim form later may have had more negative expectations since several weeks had gone by and they had still not returned to work, and those who completed the form early may not have formed clear expectations yet.

Pain intensity was measured using an 11-point numerical rating scale and percentage of body in pain was derived from a pain drawing. Both methods have been validated and accepted as useful tools for pain measurement [25, 27]. Depressive symptomatology was assessed using the Center for Epidemiologic Studies Depression Scale (CES-D) [29]. Pre-crash general health was measured using a modification of one item from the Short Form 36 (SF-36): "How was your health the month before the accident?" and current (post-crash) general health was assessed using the item, "In general, would you say your health is now?" Response options for both questions were: "excellent; very good; good; fair; poor" [3].

Analysis

Cox proportional hazards analyses were used to assess the association between the expectations to return to work, and time-to-recovery, and associations were reported as hazard rate ratios and 95% confidence intervals. We assessed whether the factors listed above were confounders of the relationship between expectations and recovery by building bivariate models which included each factor and expectations. Those factors which produced a change of 10% or greater in the estimate (the beta coefficient) of expectations were retained as confounders [30]. A final model that adjusted for the identified confounders was built and the hazard rate ratio reported (adjusted hazard rate ratio). Our model met the proportionality assumption for Cox proportional hazards analysis.

The variable "expectation to return to work" was dichotomized because this cohort was relatively small, and the number of persons reporting that they did not expect to return to work was low ($n = 42$), which would have lead to very poor precision in the estimates. Justification for combining the "no" and the "don't know" group was twofold: First of all, the time to self-reported recovery was almost identical for those persons who did not anticipate returning to their usual employment, and those who did not know whether they would return to their usual employment. Secondly, personal and event-related characteristics were similar between these two groups.

Subjects were followed until they met the criteria for recovery, or to the end of the study period. Assuming that attrition occurred randomly between the last completed follow-up and the first uncompleted follow-up, those who dropped out of the study prior to having recovered were censored half way between the last participation point and the next scheduled interview. All analyses were completed using SPSS for Windows, version 16.0 [33]. The study was approved by the Health Research Ethics Boards at the Universities of Alberta and Saskatchewan.

Results

In total, 2,335 individuals met our inclusion criteria. Age of participants ranged from 18 to 83 years. Data were missing for 173 (7.2%), including those that did not answer the questions on self reported recovery or for questions regarding confounding factors. Another 112 (4.6%) did not participate in any of the follow-up interviews. The descriptive characteristics of our cohort are outlined in Table 1. Median time from the crash to completing the claim form was 11 days.

The majority (66.0%) anticipated that they would get well enough to return to their usual job, while 32.2% were unsure and 1.8% felt that they would not return to their usual job. As indicated above, the time to recovery was almost identical for those who did not anticipate returning to work and those who did not know (Kaplan–Meier curves

not shown), and the baseline characteristics were very similar, so for the rest of our analyses, we combined the two latter groups in order to improve statistical precision. The expectations to return to work were unrelated to age. In comparison with those who had positive return to work expectations, those who responded "no" or "don't know" had less education, were more likely to be male, had more depressive symptomatology at baseline, and had greater initial headache and low back pain (Table 1). Interestingly, participants' expectations to return to work were unrelated to the time from the crash until completion of the claim form (and responding to the expectations question).

Four of the factors listed above as potential confounders met our criteria as confounders of the relationship between expectations to return to work and self-rated recovery (that is, they changed the strength of the relationship between these two variables). These were: percentage of body in pain after collision, initial post-injury neck pain intensity, initial post-injury depressive symptomatology and post-injury self-reported health. After adjusting for these confounders those who expected to return to work recovered at a rate that was 42% faster than those who did not expect to return to work or did not know (Table 2). As a sensitivity check of this model, a model that included all possible confounders (listed in "Materials and methods") was also built, but this did not appreciably change the estimates.

Discussion

Our results support the idea that expectation to return to work is not simply an indirect measure of other factors but has an influence on the recovery process. Our findings demonstrate the relationship between return to work expectation and recovery. Those who had a positive return to work expectation had a 42% faster rate in achieving the index of recovery (self-reported recovery with no recurrence of symptoms), after adjusting for confounding factors. These results are consistent with findings of others that show more positive expectations lead to better outcomes [5, 8, 12, 18, 37].

As claims due to neck pain are frequent [10], and recovery from whiplash injuries is a prolonged process for many [2, 5–7, 36], factors that influence recovery become important, particularly if these factors are amenable to change. A recent study reports a consensus opinion of an expert panel that expectations are likely modifiable [17], although this has not been assessed empirically. However, it has been postulated that the observed reduction of WAD symptoms via reassurance and educational interventions occurs through changing of expectations [4].

Poor or low expectations for return to work should cue health care practitioners and return to work stakeholders to

Table 1 Characteristics of cohort stratified by return to work expectation at baseline (post-event) ($N = 2,335$)

Factor	No or don't know ($N = 795$)	Yes ($N = 1,540$)
Age (years) [*n*(%)]		
<24	175 (22.0)	333 (21.6)
24 < 30	133 (16.7)	232 (15.1)
30 < 40	211 (26.5)	394 (25.6)
40 < 50	143 (18.0)	338 (21.9)
≥50	133 (16.7)	243 (15.8)
Marital status [*n*(%)]		
Married/common-law	402 (50.6)	702 (45.6)
Not married/common-law	392 (49.4)	837 (54.4)
Number of dependents [*n*(%)]		
0	443 (55.7)	885 (57.5)
1–2	258 (32.5)	482 (31.3)
≥3	94 (11.8)	173 (11.2)
Education [*n*(%)]		
Less than high school	212 (26.7)	305 (19.8)
High school graduate	228 (28.7)	389 (25.3)
More than high school	354 (44.6)	843 (54.8)
Income [*n*(%)]		
$0–$20,000	254 (32.6)	389 (25.7)
$20,001–$40,000	272 (34.9)	501 (33.1)
>$40,000	254 (32.6)	622 (41.1)
Gender [*n*(%)]		
Female	435 (54.7)	960 (62.3)
Male	360 (45.3)	580 (37.7)
Health month prior [*n*(%)]		
Fair or poor health	42 (5.3)	57 (3.7)
Good to excellent health	752 (94.7)	1483 (96.3)
Baseline depressive symptoms[a] [*n*(%)]		
Yes	526 (68.8)	752 (50.0)
No	238 (31.2)	751 (50.0)
Headache or back pain [*n*(%)]		
Moderate or greater pain	718 (91.3)	245 (16.0)
Less than moderate pain	68 (8.7)	1287 (84.0)
Previous neck injury [*n*(%)]		
Yes	215 (27.2)	403 (26.3)
No	575 (72.8)	1129 (73.7)
Previous musculoskeletal problems [*n*(%)]		
No to mild effect	174 (21.9)	386 (25.1)
Moderate to severe effect	88 (11.1)	148 (9.6)
Absent	532 (67.0)	1003 (65.3)
No. of days to completing form[b], mean (SD)	12.6 (8.9)	11.8 (8.5)
Percent body pain[b], mean (SD)[c]	29.3 (17.5)	25.0 (15.9)
Neck/shoulder pain[b], mean (SD)[d]	7.42 (1.82)	6.63 (1.99)

[a] Yes refers to a CES-D score ≥16; No refers to a CES-D score <16

[b] Denotes continuous variable

[c] Percentage of body in pain was assessed with a pain drawing

[d] Neck/shoulder pain was measured on an 11-point NRS

Table 2 The strength of association between positive return to work expectation and time to recover

Exposure	Crude HR (95% CI)	Adjusted HR (95% CI)
Return to work expectation		
Yes	1.79 (1.60–2.00)	1.42[a] (1.26–1.60)
No or do not know	1.00	1.00

[a] Adjusted for the following confounders: CES-D score at baseline, self-assessed health month prior to collision, numerical rating for neck/shoulder pain at baseline and percentage of body in pain at baseline

further explore which psychosocial factors may be at play which comprise this construct, with the goal of facilitating more positive expectations [23]. Findings from qualitative research have demonstrated the major domains of job/financial security, re-injury, workplace support and self-image as important themes for return to work expectation for those with low back pain, and similar themes may be uncovered for WAD patients [32] but would require further investigation.

It is still unclear through what mechanisms health expectations influence health outcomes but conceptual models can provide useful directions for future research. Janzen et al. have proposed a model of health expectation which supports the idea that previous experience with similar events, knowledge and beliefs of the event itself (for example, the severity of the symptoms) and knowledge and beliefs about the usual course of recovery are all important factors in forming an expectation [24]. Expectations also form prior to experiencing an injury. For example, many in the general public who have never experienced WAD believe that such injuries have a poor prognosis and frequently lead to chronic symptoms [13]. Although the majority of studies suggest that full health recovery in WAD can, in fact, be prolonged, and a synthesis of the existing literature suggests that approximately 50% still report WAD-symptoms 1 year after the crash, these symptoms are severe or debilitating in only about 10%, with the remainder having a more positive prognosis [5]. Our findings show that positive return to work expectation is independently associated with the rate of self-reported recovery. This suggests the hypothesis that modifying recovery beliefs and expectations (both for overall health recovery and for return to work) might improve actual recovery. This would have to be tested in randomized controlled trials, possibly incorporating a focus on positive expectations in initial health care visits.

An important strength of the study is the use of a prospective cohort (with clear inclusion/exclusion criteria) with time to event data with ascertainment of all eligible persons over the study time period. This eliminates potential for selection bias as the entire population was included within the study. The excellent follow up rate (>88%) and large study population enrolled provides strong evidence regarding the relation between return to work expectation and self-reported recovery according to quality criteria for prognostic studies [22]. A broad range of demographic, social, work, psychological and crash-related factors were included in the baseline application form, which lead to our ability to consider a wide variety of important confounding factors. The baseline data were available from insurance claims forms, so we have near complete information for all of our factors, and those factors with missing information constituted less than 10%. Measurement of important variables such as depressive symptoms was done using a valid, reliable instrument, the CES-D. Other questions in this study had been widely used in prior studies and appeared to have good face validity to assess the construct intended.

Our study also has several possible limitations. We used self-reported symptoms to determine inclusion in our WAD cohort. Therefore, there may have been some misclassification; for example, some individuals may have had more serious injuries despite being in hospital for no more than two days. Although we adjusted for indices of injury severity in our analysis, there may have been some residual confounding of injury severity. In addition, our outcome information was ascertained at pre-specified time points rather than assessed on a continuous basis. This means that we cannot identify the precise time at which self-reported recovery was attained, and this would have lead to a decrease in variability around the outcome measure. Much more frequent assessment of outcome would lead to richer and more precise information about time to recovery; however, it would also have incurred an unreasonable burden on participants, and would be impractically costly in such a large study.

Conclusion

Knowledge of an individual's return to work expectation is informative to their actual course of recovery based on self-reporting. Those who had a positive expectation to return to work had a 42% faster rate of self-reported recovery without recurrence compared to those who did not have a positive expectation to return to work. This informative prognostic factor is easily assessed, has clinical as well as economic utility, and could potentially be amenable to change as demonstrated by a previous study. Future research focused on timing of expectation questions, how interventions can alter return to work expectations, and whether more precise work related factors (e.g., co-worker relations, self autonomy at work) can alter return to work expectations would be useful.

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