Original article

Development of a symptom expectation questionnaire for whiplash injury

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Abstract

Background: Expectations and beliefs appear to be important predictors of outcome following whiplash injury. Instruments for measuring these expectations in the general population have not been well studied. The objective of this study was to develop a simple symptom expectation questionnaire for whiplash injury for use in future research studies.

Methods: An existing database of 179 injury-naıve subjects who completed a 56-item checklist of expected symptoms for whiplash injury was analyzed to determine which items could correctly identify an a priori case definition of an expecter (a subject who expected at least one of these symptoms would remain chronic following whiplash injury). A total of seven of the 56 items were found to be discriminatory. The identified, discriminatory items were then tested in additional subject groups against the original questionnaire.

Results: From the original database of 179 subjects completing a 56-item symptom expectation checklist, 119 expected at least one of the 56 symptoms would be chronic following whiplash injury. The 119 expecters, however, all chose at least one of seven items: headache, anxious or worried, depressed, neck pain, problems sleeping, back pain, or jaw pain. Using these seven items, in two new groups of subjects given the 56-item symptom expectation checklist and then a new shortened (7-item) symptom expectation checklist one week later (and the same done for another group of 100 subjects in reverse order), all those who endorsed one of the 56 symptoms as likely to be chronic following whiplash injury (expecters) could also be identified on the 7-item checklist.

Conclusion: A shortened (7-item) symptom expectation checklist of commonly reported symptoms following whiplash injury (headache, anxious or worried, depressed, neck pain, problems sleeping, back pain, and jaw pain) correctly identifies subjects who expect at least one symptom will be chronic following minor head injury (i.e., an expecter). This shortened (7-item) symptom expectation checklist can be used in future population-based studies to understand the prevalence of belief patterns and expectations for whiplash injury.

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1. Introduction

Given the observation that expectations and beliefs are predictors of various aspects of recovery from whiplash injury,1–6 there is a need to determine the prevalence of these expectations and beliefs in the general population (i.e., in the injury-naıve population). It is this population that is at future risk for developing worse outcomes following whiplash injury because of those beliefs.1,7 An aspect of beliefs concerns expectations of recovery and particularly the expectation that certain symptoms are likely to be chronic after whiplash injury. One study of 179 subjects in Canada, for example, found that 119 of 179 subjects who had never experienced
whiplash injury themselves, believed that at least one symptom from an available 56-item symptom checklist would not only occur following whiplash injury, but would remain chronic.\textsuperscript{8} Many subjects chose multiple symptoms as likely to remain chronic, the most commonly endorsed symptoms being related to headache, neck pain, back pain, anxiety, depression, problems with concentration, problems with memory, and jaw pain.

It has been recently demonstrated that an expectation checklist need not be lengthy to correctly identify expectations in minor head injury.\textsuperscript{8} Indeed, a previously reported developed checklist need not be lengthy to correctly identify expectations related to headache, neck pain, back pain, anxiety, depression, problems with concentration, problems with memory, and jaw pain.\textsuperscript{8}

The purpose of an “expectation checklist” is to identify an individual who, when given a vignette regarding injury, will endorse one or more symptoms as likely to remain chronic after that injury. A previous study\textsuperscript{9} had set the case definition of an “expecter” for whiplash injury as a subject who endorsed at least one symptom that would remain chronic after a whiplash injury. These individuals were identified as expecters on a 56-item checklist in that previous study.\textsuperscript{9}

To determine if a shortened, 7-item checklist would identify the same subjects as expecters as found in the previously studied 56-item checklist, subjects completed both checklists, one week apart.

The results of a survey of Canadian subjects for their expectations following whiplash injury are used in this study.\textsuperscript{9} As described in the published study, a 56-symptom expectation checklist was developed that included the same items used by Mittenberg et al.\textsuperscript{10} and Aubrey et al.\textsuperscript{11} combined, these latter authors having previously examined symptom expectation in North America without assessment of expectations of chronicity. Using this 56-item symptom expectation checklist, subjects were given a vignette prior to review the checklist:

Automobile accidents are a fact of life and can happen to anyone. We are interested in your opinion of what symptoms or problems might affect you after an accident. Imagine that you were driving or sitting as a passenger in a car and suddenly another car hit you from behind. Your head did not hit anything, but the force of the accident did cause your head to jerk back and caused a neck sprain (whiplash). Check YES or NO for each of the symptoms you think you might have as a result of the accident. For those you check YES, check off ONLY ONE time period that best describes for how long you think you would have those symptoms.

The instrument, as shown in earlier studies, then requires the subject to indicate the symptoms expected, but then also indicate the duration, which allowed us to examine for expectation of acute symptoms and symptoms expected to be chronic.

2.3. Development of a shortened symptom expectation checklist

From this aforementioned database, a shortened symptom expectation checklist was created. First, it was noted that 119 of 179 subjects chose at least one of the 56-items as not only being expected to occur following whiplash injury, but to last for “months to years”. These subjects were labeled as having met the case definition of an expecter. The responses of individual subjects were examined to determine the fewest number of items that had to be retained in the checklist to correctly identify each of these expecters. This short list of items (discriminatory items) formed the shortened symptom expectation checklist for further testing.

2.4. Testing of the shortened symptom expectation checklist

These discriminatory items were then tested with two groups of 100 subjects recruited in a fashion similar to the original survey,\textsuperscript{9} from a local university. The subjects were surveyed with both the 56-item symptom expectation checklist and the shortened symptom expectation checklist. One group of 100 was given the 56-item symptom expectation checklist first, then the shortened symptom expectation checklist one week later. The second group of 100 subjects was given these checklists in reverse order, again one week apart.

Subjects were approached by one individual, and were presented with the instrument, a written statement of the intent of the study, and the exclusion criteria. Data were collected about age, gender, and education level. This was part of a larger study examining beliefs and expectations about a number of conditions, some of which have been published.\textsuperscript{12} The study protocol excluded those who had a head, facial, or neck injury in a previous motor vehicle collision, or had an immediate family member with such an injury. Originally, we considered excluding any subject who may have known anyone who had these injuries, but since in previous work we found these injuries...
to be very common, we simply excluded those with a personal experience or immediate family member with such an experience. In this way, most of the subjects were likely to be naive (in terms of direct experience) of the outcomes of these injuries. The inclusion criteria was age 18 or older, and the exclusion criteria were unable to communicate in English; had a head, facial, or neck injury in a previous motor vehicle collision, or had an immediate family member with this injury.

We did not ask if the subjects had any of these symptoms. That is the subject of a future study, to determine if having a symptom, regardless of the cause, affects expectations after injury.

2.5. Sample size calculations

The study relied on existing data and thus no a priori sample size calculations were made.

2.6. Statistical analyses

Descriptive statistics were reported regarding the age and gender of subjects. Education levels were also compared between groups. The number of expecters from each survey instrument were reported, an expecter being defined as any subject who endorsed at least one item from the checklist as likely to be chronic following minor head injury.

Individual responses were assessed to determine if subjects who were deemed expecters on the 56-item symptom expectation checklist would also be classified similarly on the shortened symptom expectation checklist, and vice versa.

This study was approved by the Research Ethics Board of the University of Alberta.

3. Results

As stated previously, from the original database of 179 subjects (age 35.0 ± 11.0 years (mean ± SD), 56% female), with 119 expecters, of the 56 items, seven were discriminatory and captured each expecter. That is, all 119 expecters, at the very least, endorsed one or more of these seven items: headache, anxious or worried, depressed, neck pain, problems sleeping, back pain, and jaw pain.

A total of 59 of 100 new subjects (age 32.5 ± 9.6 years, 52% female), given the 56-item symptom expectation checklist were expecters. These 59 subjects were also correctly identified 1 week later as expecters on the shortened (7-item) symptom expectation checklist comprised of the above-mentioned seven items, and none of the responses on the shortened (7-item) symptom expectation checklist identified expecters that were not already detectable from the 56-item symptom expectation checklist.

A total of 56 of 100 additional subjects (age 34.8 ± 7.8 years, 52% female), given the shortened (7-item) symptom expectation checklist were expecters. These 56 subjects were also correctly identified 1 week later as expecters on the 56-item symptom expectation checklist, and none of the responses on the 56-item symptom expectation checklist identified expecters that were not already detectable from the shortened (7-item) symptom expectation checklist. Education levels were similar between all groups.

4. Discussion

This study shows that a previously utilized 56-item symptom expectation checklist can be reduced to a shortened (7-item) symptom expectation checklist and still capture those individuals who hold the expectation that whiplash injury is likely to result in chronic symptoms. The shortened (7-item) symptom expectation checklist is comprised of these items: headache, anxious or worried, depressed, neck pain, problems sleeping, back pain, and jaw pain. These are symptoms commonly reported after whiplash injury.

There are limitations to this study. The sample sizes are relatively small, and do not reflect a population-based survey. Nevertheless, the subjects provide a wide range of education levels and both genders are included. Previous studies have found that beliefs about injuries are not generally affected by age, gender, education, or previous injury experience.

It is clear that expectations of chronic pain and other symptoms after whiplash injury are highly prevalent, even in those who have not experienced the disorders before. These findings have direct and important clinical interventions. Expectations for type and duration of symptoms exist prior to the injury. Whiplash injury is seen in the general public as often having a poor prognosis, frequently leading to chronic symptoms. It seems likely that these prior beliefs are influential in the expectations individuals form for their own recovery after an actual injury, and that these expectations for recovery are modified by the immediate injury experience (for example initial pain intensity and extent), as well as by early experiences with health care professionals.

The findings of this study suggest that it is worthwhile to consider population-based surveys of expectations and beliefs following whiplash injury and a shortened (7-item) symptom expectation checklist can serve this purpose. As the expectations become known on a population level, social marketing campaigns can be considered, knowing the prevalence and pattern of these expectations. It seems prudent to begin asking whiplash patients about their expectations after acute injury, since clearly these expectations exist even before the injury (as the current survey shows), but could be further modified. It has been shown that expectations are indeed a predictor of recovery from acute whiplash injury. Modifying expectations or the behaviors that flow from these expectations may be an avenue of secondary prevention of chronic pain.

References


