The notion of a “whiplash culture”: a review of the evidence

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Abstract

Objective: Most whiplash patients eventually recover, although some are left with ongoing pain and impairment. Why some develop long-term symptoms after whiplash, whereas others do not, is largely unknown. One explanation blames the cultural expectations of the population wherein the injury occurred, engendering the moniker *whiplash culture*. The purpose of this review was to locate and discuss studies that were used as a basis for developing the whiplash culture concept and to evaluate its plausibility.

Methods: The PubMed database was searched using combinations of the terms *whiplash culture*, *whiplash OR WAD*, and *chronic OR late OR long term*. Search dates spanned from 1950 to June 2008. Filters were set to only retrieve English-language citations. Articles that dealt with the whiplash culture were selected and examined to determine which studies had been used to create the concept.

Results: Nineteen articles discussed the cultural aspects of whiplash and were explored to determine which were used as a basis for the whiplash culture. Eight studies were found that met this final criterion.

Conclusion: There are many unanswered questions about the basis of chronic whiplash, and the notion of a whiplash culture is controversial. Chronic whiplash symptoms are surely not caused entirely by cultural issues, yet they are probably not entirely physical. Presumably, a tissue injury component exists in most chronic whiplash-associated disorder victims that becomes aggravated in those who are susceptible to biopsychosocial factors. As with many other controversial health care topics, the answer to the debate probably lies somewhere in the middle.
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Introduction

Chiropractors commonly care for patients with neck pain, which is frequently caused by automobile collision that result in whiplash injuries. Neck sprains and strains are the most frequent type of injury claim

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reported to insurance companies in the United States, comprising 25% of all injury-related claim dollars paid out by insurers each year. Moreover, the total annual cost of the rear-impact type of whiplash injuries in the United States, which includes economic costs as well as costs related to quality of life impacts, has been estimated to be approximately \$2.7 billion.¹

Most whiplash patients recover over time, although some are left with long-lasting and sometimes permanent pain and impairment. In Canada, for instance, a cohort of 2627 persons with whiplash that resulted from an automobile collision was followed for up to 7 years.² The median time to recovery for the overall group was 32 days, but 12% of the subjects still had symptoms at 6 months. Another study reported that 45% of 419 subjects with

chronic neck pain considered its origin to have been a prior automobile collision.³

Exactly why certain people develop long-term symptoms after a whiplash injury, whereas others recover within a relatively short period, is largely unknown, although a number of suspected risk factors have been identified.⁴ One explanation that has been proposed in the literature lays the blame on the cultural expectations of the population in which the injury occurred, engendering the moniker *whiplash culture*. The purpose of this review was to locate and discuss the studies that were used as a basis for developing the whiplash culture concept and to evaluate its plausibility. There has been much written in the literature on this topic, but it should be noted that the current work is a review of the

Table 1 Studies commonly used as a foundation for the whiplash culture concept

Author	Study Type	No. of Subjects	Source of Cases	Findings
Schrader et al ²⁴	Cohort (Retrospective Questionnaires 1 to 3 y After Rear-End Collision)	202 Cases, 202 Controls	Traffic Police Department Records in Kaunas, Lithuania	No Significant Differences Found Between Groups. No Subjects Had Disabling or Persistent Symptoms.
Obelieniene et al ²⁵	Cohort (Retrospective Questionnaires 1 to 3 y After Rear-End Collision)	202 Cases, 202 Controls	Traffic Police Department Records in Kaunas, Lithuania	Headache Patterns Were Similar Between Groups.
Ferrari et al ²⁶	Cohort (Retrospective Questionnaires 14 to 27 mo After Rear-End Collision)	210 Cases, 210 Controls	Traffic Police Department Records in Kaunas, Lithuania	Similar Proportion of Jaw Symptoms Between Groups and a Low Prevalence of the Condition.
Obelieniene et al ²⁷	Cohort (Prospective Questionnaires After Rear-End Collision; Soon After, 2 mo, and 1 y)	210 Cases, 210 Controls	Traffic Police Department Records in Kaunas, Lithuania	No Significant Differences Between Injured Group and Controls Regarding Frequency or Intensity of Neck Pain and Headache.
Partheni et al ²⁸	Cohort (Prospective Questionnaires at 6 mo)	180 Patients	Emergency Department	All Subjects Returned to Preinjury Health Status. No Subjects Had Disabling or Persistent Symptoms.
Ferrari et al ²⁹	Comparative (Groups Imagined Expected Symptoms After a Whiplash Injury)	171 Lithuania, 179 Canada	Employees of Utility Companies	Up to 50% of Canadians Expected Symptoms to Last Months or Years, Whereas Greeks Expected Few Were Likely to Persist.
Ferrari et al ³⁰	Comparative (Groups Imagined Expected Symptoms After a Whiplash Injury)	200 Greece, 179 Canada	Employees of Utility Companies	Up to 50% of Canadians Expected Symptoms to Last Months or Years, Whereas Lithuanians Expected Few Were Likely to Persist.
Ferrari and Lang ³¹	Comparative (Groups Imagined Expected Symptoms After a Whiplash Injury)	151 Germany, 179 Canada	Employees of Utility Companies	Up to 50% of Canadians Expected Symptoms to Last Months or Years, Whereas Germans Expected Few Were Likely to Persist.

literature that attempts to present an objective overview of the evidence, whereas others have been commentaries.

Methods

A search of the PubMed database was conducted using combinations of the terms *whiplash culture*, *whiplash OR WAD*, and *chronic OR late OR long term*. Dates of the search spanned from 1950 to June 2008. PubMed filters were set to only retrieve citations in the English language. Chiropractic databases were not included in the search process because the type of research on this subject is not typically reported in chiropractic-specific journals. Retrieved articles that somehow dealt with the whiplash culture issue were selected and were examined to determine which studies were used as a foundation for the concept. Letters were not included in this review.

Results

The search netted 481 citations, although 13 of them were omitted because they were duplicates. Nineteen of the remaining articles⁵⁻²³ included a discussion about the cultural aspects of whiplash and were explored to determine which articles were used as a basis for the whiplash culture. Eight studies²⁴⁻³¹ were found that met this final criterion, which are recorded in [Table 1](#).

Discussion

Several studies have pointed out differences in the likelihood of developing chronic symptoms after whiplash that depend on the country from which the data were gathered. For example, a study that took place in Greece reported that all 180 members of their cohort of whiplash patients returned to their preinjury state of health within 6 months subsequent to injury and that no cases of chronic disability occurred.²⁸ Another study that was carried out in Lithuania²⁴ reported that 35% of the injured cohort noticed early neck pain and headaches, although the percentage was not significantly different from a group of matched controls. None of the subjects ended up with disabling or persistent symptoms. Several other studies were conducted in Lithuania using slightly different methods,²⁵⁻²⁷ each reporting similar results—that very few Lithuanians experience long-term symptoms

after whiplash. Finally, a study involving whiplash patients from Germany reported findings closely resembling those of the studies emanating from Greece and Lithuania.³²

These studies have fostered the idea that the probability of developing chronic symptoms after a whiplash injury is largely dependent on the cultural expectations of the population in which the injury occurred. Based on these observations, Ferrari et al²⁹ opined that “The late whiplash syndrome, if it exists at all in these countries, is uncommon.” Ferrari et al²⁹ and Ferrari and Lang³¹ proposed a biopsychosocial model to explain the apparent discrepancies in the epidemiology of chronic whiplash between different countries. In this model, symptoms are not merely the result of a somatic expression of anxiety or other psychologic disorder, but psychosocial factors in those countries with a whiplash culture wherein the occurrence of the late whiplash syndrome is common.

An earlier study by Balla³³ has also been used to support the cultural expectations concept. In this study, differences were noted between the rates of chronic whiplash symptoms between Singapore, a region where taking on the sick role after this type of injury is not generally accepted, and Western countries like Australia, where whiplash injuries are legitimized. The author of this report thought his observations supported generalizations about the development of chronic whiplash syndrome as a social illness that is different across various cultures. However, the study was criticized by Barnsley³⁴ because it was “... little more than anecdotal from interviews of selected Singaporean doctors compared with data from Australia.”

The biopsychosocial model was inspired in part by studies that highlighted the differences in rates of chronic whiplash between various countries (eg, Lithuania and Greece vs the United States and Great Britain) and in part by studies that point out how people have expectations about what their symptoms will be after whiplash (ie, that an acute whiplash injury may cause chronic symptoms and disability).²⁹⁻³¹ The outcome of these cultural differences, as well as the potential for patients’ expectations to hamper their recovery, results in modified illness behaviors of some whiplash patients making them susceptible to long-term problems.²⁹

The idea of a whiplash culture is also based on the “symptom expectation” theory, wherein persons in some countries are more likely to envision having long-term symptoms after a whiplash injury than persons from other countries. This assertion was initially

derived from a study that queried naive subjects from a country that had a whiplash culture about the kinds of symptoms they would expect to see in whiplash patients.³⁵ The subjects expected whiplash victims to have symptoms that were very similar to what has been reported in the literature. However, no comparisons were made with other countries that lack a whiplash culture. It is therefore not really known what, if any, differences actually exist between countries on this issue. Ferrari and Lang also cited another study to support the symptom expectation theory that dealt with symptoms a group of subjects would expect to occur 6 months after a mild head injury,³⁶ but any comparison with whiplash is speculative. Based on these studies, however, Ferrari³⁷ noted that "In North America there is overwhelming information regarding the potential for chronic pain after whiplash injury." The logic then asserts that because North Americans are so well informed, they expect to develop chronic whiplash-associated disorder (WAD).

In short, the logic of the whiplash culture theory is as follows. In countries wherein the population generally accepts chronic whiplash as being a real condition, a whiplash culture is assumed to exist; and a substantial proportion of persons with whiplash injuries develop chronic symptoms after injury. On the other hand, in countries that lack a whiplash culture, wherein the people do not generally accept chronic whiplash as being a real condition, very few people develop chronic symptoms.^{31,38}

The Greek²⁸ and Lithuanian²⁴ cohort studies mentioned earlier have been criticized in the literature. Merskey,³⁹ for instance, noted that the validity of the Lithuanian study had been questioned by the Norwegian Centre for Health Technology Assessment, a group established by the Department of Health and Social Affairs for Norway. The Norwegian report indicated that more than 4000 persons would be needed in each group to reach an 80% probability of finding a statistically significant difference, but only about 200 were actually included in the groups. Another similar criticism came from Barnsley,³⁴ who pointed out that none of the studies commonly used to highlight the differences between the reported rates of chronic whiplash symptoms in countries having or not having whiplash cultures have adequate statistical power to show a real difference between the groups, even if one existed.

The idea that residents of North America and some European countries tend to expect chronic symptoms and disability after whiplash injuries is debatable, as evidenced by Aubrey et al,³⁵ who reported that

laypersons had misconceptions about the symptoms of whiplash and head injuries. The authors carried out a study in which questionnaires that covered knowledge of the physical and cognitive consequences of whiplash and head injuries were administered to a group of 43 subjects. The subjects' knowledge about the physical symptoms of whiplash was consistent with what is found in the whiplash literature. Yet, most of them incorrectly thought that high crash speeds would be required to produce the common physical complaints of acute WAD. They were also mistaken about their understanding of postinjury cognitive symptoms. The authors concluded that it was unlikely that patients with persistent complaints after whiplash injuries derive their symptoms from common knowledge about the condition's sequelae.

Carroll et al⁴ indicated that the reported differences in rates of recovery after whiplash between countries are not well understood. The authors mentioned a number of reasons that could be responsible for the reported differences in recovery rates, including societal beliefs and attitudes. They also suggested that methodological issues in the studies, such as differences in the context in which the injuries occurred and differences in the countries' compensation policies, may have been responsible.

Ferrari et al have been criticized for not providing a balanced perspective of the whiplash literature in their portrayal of the whiplash culture. As noted by Barnsley,³⁴ "They fiercely interrogate research that does not support their view, yet uncritically embrace literature favoring their preconceptions." Pearce¹² also criticized the concept and suggested that the differences in rates of chronic whiplash between countries are best explained by social and legal expectations, rather than cultural variation.

Despite the criticisms of Ferrari's work, however, it may have at least a degree of merit. There may be real differences between countries that do not have a whiplash culture and North Americans due to their litigious disposition. Another second possible reason may be the higher number of bigger vehicles (ie, trucks and sport utility vehicles) that are preferred by many Americans, which may contribute to the severity of injuries and the resulting greater number of late whiplash syndromes found in this country. Thirdly, citizens of countries with a whiplash culture may be less tolerant of pain as compared with their more stoic counterparts in non-whiplash culture countries. Lastly, the expression of physical pain is not acceptable in some cultures, which might lead to underreporting.

Conclusion

In the end, there are still many unanswered questions about the basis of chronic WAD. Its occurrence is without question not entirely caused by biopsychosocial issues, yet it is probably not entirely physical. There is almost certainly a tissue injury component in most chronic WAD victims that becomes aggravated in those who are susceptible to various biopsychosocial factors. For instance, the cervical facet joints have been shown to generate pain in most chronic whiplash patients, many of whom experienced temporary pain relief after facet joint injections.⁴⁰ As it is with many other controversial health care topics, however, the answer probably lies somewhere in the middle of the debate.

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