

Risk factors associated with adverse health and safety outcomes in the US Hispanic workforce

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Background: Historically, jobs that are high in physical labour such as construction, farming, fishing, mining and manufacturing tend to have the highest accident and fatality rates. Many working in these sectors, particularly of Hispanic origin, have been experiencing higher numbers of accidents than workers from other backgrounds.

Objective: To investigate adverse safety and health outcomes among Hispanic workers in the US associated with risk factors by means of a systematic review of analytical studies.

Methods: A keyword search was used within several academic databases to search for applicable articles. A critical appraisal was carried out to evaluate the selected studies according to epidemiological principles.

Results: The critical appraisal of six relevant studies revealed that lack of education and training, language barriers, culture barriers and job type are risk factors associated with adverse safety and health outcomes in Hispanic workers in the US. However, results may be limited due to a need for specific information regarding subject loss and issues regarding generalization to eligible populations.

Conclusions: There is still a need for studies investigating the relationship between specific risk factors and their influence on immigrant workers. Research should take into account other variables such as immigration status and develop proper interventions to assess the effectiveness of prevention methods such as proper bilingual safety training.

Keywords: Hispanic workforce; Immigrant workers; Risk factors; Health and safety

1. Introduction

Occupational injuries, fatalities and other safety issues have been a primary concern in US industry due to the rising costs of health care and workers' compensation. Historically, industries that are high in physical labour such as construction, farming, fishing, mining and manufacturing tend to have the highest accident and fatality rates. According to the Census of Fatal Occupational Injuries (CFOI),

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the rate of fatal occupational injuries in 2003 per 100 000 employed in industry by sector was: 2.5 for manufacturing, 11.7 for construction, 26.9 for mining and 31.2 for the combination of agriculture, forestry, fishing and hunting (the highest of all the sectors) (BLS 2004b).

Many individuals working in those sectors are immigrant workers, mainly of Hispanic origin. Schmidley (2001) reports that 10% of people living within the US were born abroad and are primarily of Hispanic ethnicity. Of these recent immigrants, 50.1% come from Latin America and are of working age (median age 35.3 years) (Schmidley 2001). A study conducted by Fabrega and Starkey (2001) showed that, in a population of US construction workers, 46.5% were Hispanic. For the purpose of this review, a Hispanic worker is defined as 'any worker whose origin is Cuba, Puerto Rico, Mexico or the Spanish-speaking countries of Central and South America'.

According to the BLS (2004a), Hispanics have been experiencing higher occurrences of accidents in the workplace than workers from other backgrounds. This could be related to the fact that Hispanics work in job types that typically have higher accident rates. In a study involving construction workers, 68.6% of falls from roofs were Hispanic workers, many of them foreign born and with low skill level (Fabrega and Starkey 2001). Of workers who were struck by an object or equipment, 65% were of Hispanic ethnicity. The same study showed that 10 of 12 construction workers who died as a result of being caught or crushed in excavation were Hispanic.

Another reason Hispanics may be experiencing higher accident rates is due to language barriers. Hispanic immigrants' primary language is Spanish. When working in the US, low levels of English proficiency combined with low levels of educational attainment could make language a primary obstacle this population has to overcome in the workplace.

Another obstacle may be the lack of education and training. Of the Hispanic immigrants that work in the farming, fishing or forestry industry, fewer than 50% have a high-school diploma (Schmidley 2001). Quandt *et al.* (2001) showed that poor education and lack of training may lead to increased injuries within the workplace.

Cultural barriers could be another concern for Hispanics in the US workplace. Although the term 'Hispanic' encompasses individuals from many countries with different socioeconomic and psychosocial backgrounds, there may be common cultural themes that put these individuals at risk for injury in the workplace.

The purpose of this research is to examine evidence of adverse safety and health outcomes in Hispanic workers within the US associated with explicit risk factors (type of job, language barriers, lack of education and training and cultural barriers) through a systematic review of analytical studies. To the authors' knowledge, a review of this topic has never been carried out before.

2. Methods

2.1. Search strategy and inclusion criteria

The search was carried out seeking peer-reviewed, analytical studies that reported any links between explicit risk factors and adverse health and safety outcomes in the workplace, particular to the Hispanic community. To keep the search as broad as possible, no time limits were placed on the dates of publications. The databases initially used for this search were Medline, NioshTic, NioshTic2, PubMed,

Health and Safety Science Abstracts and OSHALine, using the following keywords: illegal immigrant workers, legal immigrant workers, Mexican workers, health and safety accidents, Latin workers, Hispanic workers, United States, America, US, USA, immigrant and construction.

Excluded from this study were: all other ethnic groups, workers in US companies operating in Mexico, general population studies with no specific link to outcomes among ethnic groups, injury reports with no link between outcomes and ethnic groups, studies where the primary data were comprised from outside the workplace and any review studies.

The team used the above-mentioned criteria to select only abstracts showing a relationship to the topic. If there was insufficient information in the abstract the full text article was then used to determine relevance. Articles were also screened for additional references. After the first search, only five articles met the criteria. The team then broadened the search to include: PsycINFO, Compendex, AltHealth Watch, Ergonomic Abstracts and the Bureau of Labour Statistics. The final search resulted in one additional study, yielding a total of six papers for the critical appraisal. The search concluded in August 2004.

2.2. Epidemiological appraisal

All studies within this review were methodically assessed using the Epidemiological Appraisal Instrument (EAI) (Genaïdy and LeMasters 2005). The EAI assesses each article based on its study description and its methodological quality: two of the authors (AA, BG) rated each study. The inter-rater reliability was 81.45%. The two independent analyses of each study were compared and, if differing, a consensus on each item was reached in a meeting.

3. Results

3.1. Study selection

The search of the first set of databases yielded over 120 articles. After eliminating repeated articles and studies not directly related to the topic (i.e. studies involving a setting other than the workplace), 57 abstracts remained. The next selection criteria excluded articles of a descriptive nature (12 articles), review articles (one article), studies that did not provide specific results for the Hispanic population (19 articles), studies conducted outside the workplace (seven studies) and statistical reports (13 studies). Only five studies met the selection criteria (Anderson *et al.* 2000, Faucett *et al.* 2001, Elkind *et al.* 2002, Pransky *et al.* 2002, Magaña and Hovey 2003). A new group of databases was searched and one article was identified that met the selection criteria (Gilkey *et al.* 2002). In total, six articles were included.

3.2. Description of evidence

For all the studies in this review, the study population, risk factors, outcomes, recommendations and design are summarized in table 1. The following are highlights of these studies:

- (1) Three studies were cohorts (Anderson *et al.* 2000, Faucett *et al.* 2001, Pransky *et al.* 2002), an intervention (Elkind *et al.* 2002), a cross-sectional

Table 1. Study attributes.

Reference	Design	Study population	Risk factors	Outcomes	Recommendations
Faucett <i>et al.</i> (2001)	Cohort	213 Spanish-speaking immigrant commercial nursery workers in Southern California	Ergonomic risk factors	Occupational musculoskeletal injuries and disorders of the back and upper and lower extremities	Approaches to identify musculoskeletal injuries or response to treatment should include appropriated language, literacy and culture level Interventions should address the limited employment and union membership options that are available to minority workers in the construction industry Appropriate health and safety behaviour is likely to increase as a result of attendance at a one-act play
Anderson <i>et al.</i> (2000)	Cohort	3290 injured construction workers of black, white or Hispanic origin. (Hispanics represented 97% of the injured workers)	Type of job	Work injuries and other occupational risks	
Elkind <i>et al.</i> (2002)	Intervention	185 Hispanic farm workers (subjects), 115 community members or non-farm workers (controls)	Lack of education and training of farmers and workers	Hazards and adverse conditions in the workplace	

Magaña and Hovey (2003)	Cross-sectional	75 migrant farmworkers (38 females, 37 males) of Mexican descent in the Northwest Ohio and southern Michigan area	18 stressors were commonly experienced by this population	Reduced coping which lead to elevated levels of anxiety and depression	Need of: <ul style="list-style-type: none"> ● Prevention treatment ● Education services ● Improvement of life quality ● Support groups at campsites ● Mental and physical health screening Provide appropriate training
Pransky <i>et al.</i> (2002)	Cohort	516 Latino adults over 18 years of age that had worked for pay within the past year	Hazardous jobs	Occupational risks: work-related health concerns and work injuries	Effective treatment access, cost-effective treatment of LBP
Gilkey <i>et al.</i> (2002)	Cross-sectional nested in cohort	335 residential carpenters, 72% Hispanics and 28% non-Hispanics	Type of job	LBP disorders	Effective treatment access, cost-effective treatment of LBP

(Magaña and Hovey 2003) and a cross-sectional study nested in a cohort (Gilkey *et al.* 2002).

- (2) One common risk factor found among all studies was the type of job. Other risk factors included lack of safety and training education, psychosocial stressors (high anxiety and depression), ergonomic risk factors and language and cultural barriers.
- (3) No study investigated the difference between being a legal worker and an illegal worker.
- (4) Of the studies using a survey, all included a Spanish version.
- (5) All of the studies conducting interviews (at baseline or at follow-up) did so in Spanish.

The most common risk factors Hispanic workers are exposed to were found to be: ergonomic risk factors, type of job, lack of education and training and work-related stress.

3.3. Quality assessment

According to the EAI results, overall scores ranged between 0.6–1.2. None received a maximum score of 2.0 in any of the appraisal categories. The overall average value was 0.96. The results according to categories can be seen in figures 1–5. Important aspects of the studies are given below:

- (1) *Study description*: All the studies clearly described their objectives as well as their statistical methods, with Magaña and Hovey (2003) scoring the highest (1.5) and Elkind *et al.* (2002) scoring the lowest (0.76).
- (2) *Subject/record selection*: In most studies (five), subject loss was not reported, only Faucett *et al.* (2001) (1.0) reported subject loss. Three studies (Elkind *et al.* 2002, Gilkey *et al.* 2002, Mangaña and Hovey 2003) scored 0.5 or less.
- (3) *Observation quality*: In all of the studies, the assessment of outcome variables was documented. However, overall scores were less than adequate, with two studies (Anderson *et al.* 2000, Mangaña and Hovey 2003) scoring 0.8 and Gilkey *et al.* (2002) scoring the lowest at 0.4.
- (4) *Data analysis*: The outcome/exposure data in all of the studies were reported by sub-groups of subjects. Scores in this category were relatively high with

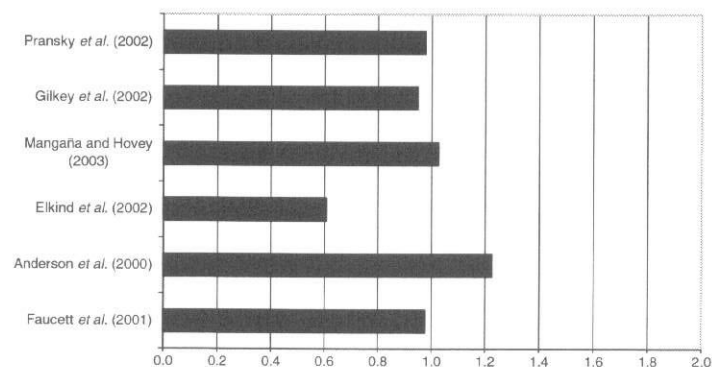


Figure 1. Overall results.

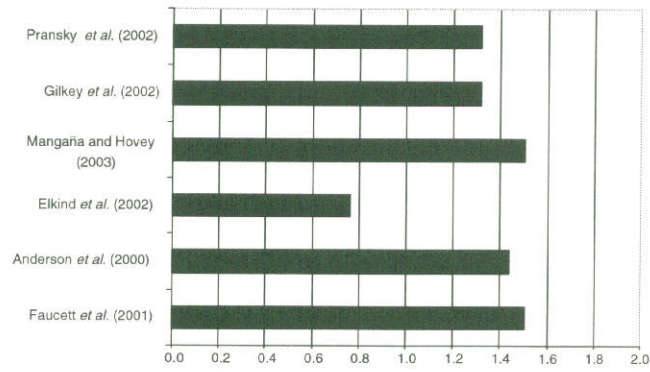


Figure 2. 'Study description' results.

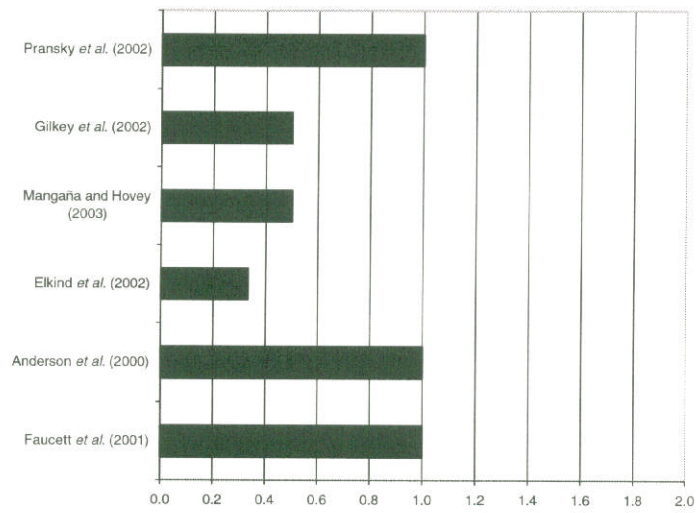


Figure 3. 'Subject selection' results.

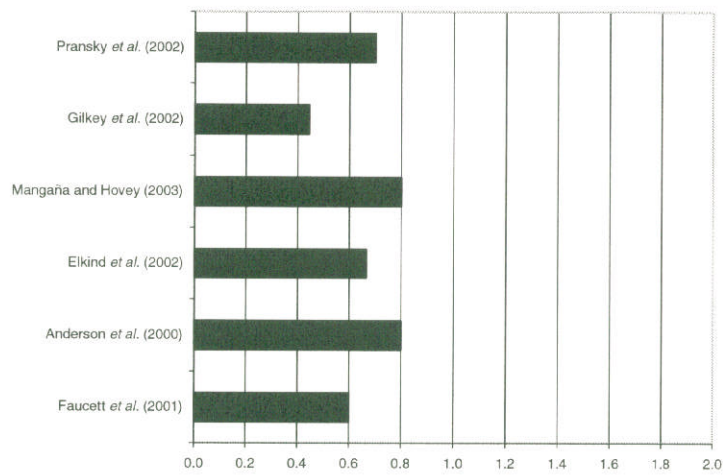


Figure 4. 'Observation quality' results.

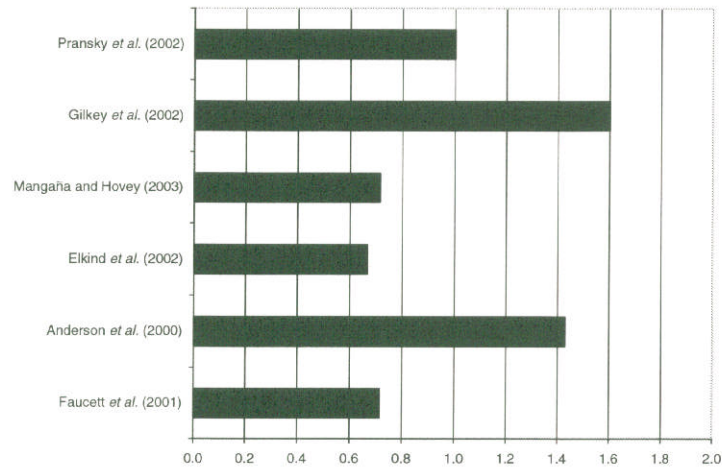


Figure 5. 'Data analysis' results.

Gilkey *et al.* (2002) scoring 1.6, Anderson *et al.* (2000) scoring 1.4 and Pransky *et al.* (2002) scoring 1.0.

- (5) *Generalization of results*: In four studies, the generalization of results cannot be applied, due to the small sample size and lack of participation rates. The results from Mangaña and Hovey (2003) can be applied to the eligible population and the results from Anderson *et al.* (2000) can be applied to the eligible population as well as to other relevant populations.

In general, Anderson *et al.* (2000) displayed the 'highest' methodological quality with a score of 1.2, while Elkind *et al.* (2002) the 'lowest' with a score of 0.6.

4. Discussion

The Hispanic population is the largest minority group within the US today (Schmidley 2001). Although there are many studies involving Hispanic workers in the US, to the authors' knowledge, this is the first systematic review that investigates a compilation of risk factors associated with adverse health and safety outcomes in this population.

Due to a lack of prior work available on this topic, this review did not include a time limitation—to keep the search as broad as possible. After examining the available literature, only six analytical studies inferring possible risk factors and their health and safety outcomes among Hispanic workers in the US were found. Only one review article discussed worksite health (Soto Mas *et al.* 1997) while most articles relevant to this topic were descriptive in nature.

In all of the included studies, there was no mention of the reliability of the exposure variables or outcome measures. Nevertheless, two of the studies (Anderson *et al.* 2000, Mangaña and Hovey 2003) could be used to generalize results in similar populations and Anderson *et al.* (2000) could be applied to other relevant populations.

This systematic review found various risk factors related to adverse safety and health outcomes among Hispanic workers in the US. One major factor was the type of job. All included studies focused on populations centred within the construction and agricultural industries which—excluding manufacturing—had the highest incident rates (BLS 2002). Hispanics in the construction and agricultural industries compromised ~ 20% of the total labour force in those areas (BLS 2003). However, job type alone cannot be the only risk factor among this population. If this were the case, there would not be a large difference in injury/fatality rates in these two industries for Hispanics compared to other ethnicities. For example, although Hispanics were only 20% of the agricultural workforce in 2002, they compromised 43.9% of the non-fatal loss time accidents (BLS 2004a).

Two risk factors that were mentioned in all of the studies were language barriers and lack of education. Speaking a foreign language was described by Gilkey *et al.* (2002) as one of the reasons Hispanic immigrants might have higher mental and physical stressors. They also report that only 20% of the participants in the study had a high-school degree or higher—a factor that could also contribute to high stress levels. Pransky *et al.* (2002) showed that just providing training is insufficient. According to this study, although people received safety training, there was a poor understanding of it, most likely due to a language barrier. For this reason an association between a lower risk of injury and training could not be established. Faucett *et al.* (2001) reported an association between injury report, identification of early musculoskeletal symptoms and level of education. They also identified language and education as barriers for reporting symptoms and injuries to employers and health care providers. This relationship was also investigated in the study by Magaña and Hovey (2003) where the impact of language may be more of a barrier in states where Hispanics are less populated, mainly the Midwest, than in those who have a larger Hispanic populace, e.g. Florida or Texas. In addition, the level of education in this study was reported to be low, 84% of the study participants completed less than 12 years of education.

Another risk factor mentioned throughout the studies was the cultural barrier. None of the studies reported any quantitative associations, but all suggested that culture may have a confounding effect. The migrant lifestyle alone is a cultural difference between the Hispanic population in these industries and the majority of the population. Magaña and Hovey (2003) linked 18 different stressors with the migrant Hispanic farm worker community. Faucett *et al.* (2001) suggested that the agricultural Hispanic workforce culture regards work as essential to life, that pain is an inevitable part of work and, thus, injuries and illnesses will occur more often.

The use of alcohol and drug abuse was taken into consideration by Gilkey *et al.* (2001), stating that 21% of the Hispanics have 3–5 drinks/beers per week or more and for 77%, their health status was ‘good’ or ‘better’.

5. Conclusions and recommendations

It is the intention of this paper to investigate health and safety concerns among Hispanic immigrant workers in the US due to explicit risk factors. Job type may be a barrier, to some degree, for any employee regardless of ethnicity. Language can be considered an obstacle when it comes to understanding the rules and following safe procedures for carrying out tasks. Cultural barriers can become a health hazard

if safety is not a common practice and injury/illness is considered a normal part of the job. In addition, lack of training and knowledge has been suggested to attribute to employees' ignorance of hazards when working with certain dangerous materials or equipment (Quandt *et al.* 2001). Although it is assumed that language and cultural barriers play a significant role in adverse safety and health outcomes, there is a lack of research in this area that would significantly benefit this population.

It is clear that special attention needs to be directed to the increasing Spanish-speaking workforce and to their educational and emotional needs in order to provide a safer working environment. This is particularly important for the agricultural and construction industries where the majority of immigrant populations work and where injury rates are among the highest in the country.

Large groups of professionals such as the American Society of Mechanical Engineers, the Occupational Safety and Health Administration, US National Labour Relations Board and/or others should create a standard for 'Health and Safety training of Hispanic born workers within the US'. These standards should include basic knowledge of English language skills and to interpret 'caution', 'warning' and other labels and signs that have not been properly translated to their native language.

There is still a great need for studies investigating the relationship between the specific risk factors previously mentioned and their influence on immigrant workers. Unlike 'native' workers, Hispanic workers not only deal with the intrinsic difficulties of a specific job, but also the cumbersome situation of a different language and culture, factors making any job more difficult than it already is.

It is important to note that further research should also take into account variables such as immigration status, which is becoming a heavier burden to working immigrants. Also, intervention studies should be developed to assess the effectiveness of prevention methods such as proper bilingual safety training.

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