
Characteristics that influence occupational health and safety knowledge among Arab American workers

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Summary:

The purpose of this study is to examine potential determinants of occupational health and safety knowledge in an Arab-American population. Three hundred unemployed Arab men and women were tested on their knowledge of occupational health and safety by a written test. We evaluated differences in mean raw test scores for age, education, language skill (English only, Arabic only, or bilingual), and place of birth, ever having been employed in the U.S. and prior OHS training. Overall scores were quite low (mean = 24% correct). There were significant differences in mean scores by age, educational level and prior OHS training in men and women. Scores were lower in men who only spoke Arabic, were born in an Arab country and had never worked in the U.S. compared to women whose scores did not seem to be affected by language, birthplace or employment status. Arab Americans job seekers are an understudied immigrant population with low levels of occupational health and safety knowledge. Whereas no knowledge or limited knowledge of English as well as educational level may contribute to lack of OHS knowledge, these are only partially explanatory. More research is needed to more fully understand the determinants of knowledge acquisition, retention, attitudes and skills among Arab Americans.

Key Words: Occupational Health and Safety knowledge, Arab American, immigrant, occupational health and safety training, ethnicity

Introduction:

Special populations at risk has been defined as workers "more likely to experience increased risks of diseases and injuries in the workplace as a result of biologic, social, and/or economic characteristics such as age, race, genetic susceptibility, disability, language, literacy, culture, and low income"⁽¹⁾. Special populations may include immigrant populations. The United States attracts immigrants for various economic, social and political reasons, which generally relate to either a real or perceived opportunity for a better life. While some immigrants may arrive with highly sought technical skills, others come illiterate, are only capable of unskilled labor, or may even arrive disabled. Data suggest that immigrant workers are particularly at risk for occupational injury and illness. Corvalan

et al found that incidence of fatalities in rural and mining occupations was significantly increased among foreign-born individuals in Australia⁽²⁾. Doos et al demonstrated an increased frequency of occupational accidents among foreigners aged 16 to 25 compared to native Swedish workers in this age group, although the differences were not statistically significance⁽³⁾. During 1994, 698 immigrant workers were fatally injured in the United States, representing 10.5% of all job-related deaths compared with the U.S. national occupational fatality incidence rate of 8.7%⁽⁴⁾. While it has been reported that 48% of the immigrant fatalities were among Hispanics, and about 20% were among Asian Americans, the numbers among Arab Americans are unknown⁽⁴⁾. We present cross-sectional data from

a study of adults residing in Dearborn, Michigan, a predominantly Arab American community in an urban, industrial corridor bordering Detroit, Michigan. This community is home to one of the largest Arab populations in North America, recently estimated at 274,000 persons ⁽⁵⁾. This very low-income, immigrant community is medically underserved and has high rates of illiteracy and unemployment. Approximately one-third of this population speaks no English, and a large percentage has resided in the United States less than 5 years ⁽⁶⁾. This community is also home to numerous large automotive and steel manufacturing facilities that collectively are responsible for large amounts of hazardous emissions into the local environment. In 1997, a single zip code in Dearborn ranked in the top 20% of all counties in the US in terms of air releases of recognized reproductive toxicants and accounted for toxic air emissions of over 1.4 million pounds to the local environment in 1995 ⁽⁷⁾. Neighboring slag plants contribute to a high volume of dust and truck traffic, and unsightly mountains of slag waste in close proximity to residential homes. Numerous other industries – oil refining, trucking, asphalt plants, waste disposal, meatpacking, and railroad lines – are located in the surrounding area ⁽⁸⁾. A recent study showed that 86.2% of the residents in this community believe that emissions from local industries were affecting their health ⁽⁸⁾. Many of the recent immigrants have come from agrarian backgrounds, and are unfamiliar with the urban industrial environment, as well applicable environmental and occupational health and safety laws and agencies in this country. Individuals who immigrate to the U.S. may be at increased risk for occupational injury and illness if they are less able to effectively advocate for safer working conditions as well as to individually

adopt safe work behaviors. Arab American workers are an immigrant group, not yet adequately investigated, who may lack the health and safety knowledge necessary to advocate for safer working conditions as well as to individually adopt safe work behaviors. One study demonstrated that the incidence of traumatic injuries, particularly those which are work-related, were higher among Arab Americans in Wayne County as compared with background rates in Michigan ⁽⁹⁾. Both language and educational level may be important factors that influence health and safety knowledge. The purpose of this study is to examine the relationship of language and education with occupational health and safety knowledge in a predominately Arab American population.

Methods:

Participants:

Subjects were recruited from individuals seeking employment services provided by the Center for Employment and Training (CET) located in this community. The CET evaluated 3284 individuals in 1998. Subjects were enrolled during a three-month period from April to June 1998. Any new unemployed client that attended the center was asked to participate. Out of 821 persons who sought employment through the CET during this time period, a total of 312 participants (36.5%) were enrolled in this study. All subjects were unemployed at the time of recruitment. Twelve subjects were excluded from the analysis because of incomplete questionnaires, leaving a study population of 300. Fifty-one percent of the study population was born in the United States, 42% were born in an Arab country and 7% were born in some other country. Demographic characteristics of study participants were compared to the

8225 CET clients seeking employment between July 1997 and July 1999 but who did not participate in order to assess the representativeness of the study sample.

Questionnaire:

Subjects were given an interviewer-administered 37-question survey that collected information on age group, sex, marital status, highest educational attainment, language, place of birth, previous occupational health and safety (OHS) training, injuries and disability from work as well as basic knowledge about OHS. Twelve items measured OHS knowledge: five open-ended questions of a general nature (e.g. can you name two occupational diseases which can arise from physical hazards, e.g. heat, noise, radiation?) and six true or false questions on more specific OHS topics (e.g. can wearing safety equipment prevent you from developing an occupational health problem?). These items were selected by experts in Occupational Medicine as indicators of basic general knowledge of occupational health and safety. The survey was translated into Arabic for bilingual administration. Six interviewers received two hours of training in survey administration. The instrument was pilot tested on 15 individuals to assess ease of administration, understandability, and response accuracy. These individuals were not included in the final study sample.

Statistical analysis:

The outcome variable of interest was test score defined as number of correct answers. There were 17 possible points on the test. The independent study variables of interest were age, education, language, birthplace, employment in the U.S., and previous training in

occupational health and safety. Education was grouped as less than high school, high school and beyond high school. Language skill was defined as knowledge of English only, Arabic only or bilingual. Age was grouped as: < 30, 30-39, and 40 and older. Previous training and ever-employed in U.S. were dichotomized as yes or no. Analysis of variance was used to test differences in test scores between our study population and the CET attendees who did not participate on sex, age and level of education. Cronbach's Alpha was used to test item scale reliability. Mean raw test scores and standard deviations were calculated for each level of sex, age, language skill, ever worked in the United States, and previous OHS training. Chi square was used to evaluate significant differences between males and females for the study variables. Univariate analysis of variance tested the differences in means of test score for each predictor variable. SPSS analysis software was used for analysis.

Results:

Table 1 describes the characteristics of the study population as compared to non-participants that attended the CET. There was significant difference between the study participants and the CET attendees for sex, age and education. There were more men in the study population and the study population was younger and better educated. It was noted that a very large percentage of the CET attendees did not report their age (39.3%) likely due to the culturally driven perception that age is personal information not to be readily shared. Test items were well correlated (Cronbach's alpha = 0.71) indicating a reliable scale for measuring OHS knowledge. The mean raw score was low among all participants (4/17= 24%) with a range of 0 to 14 (0 – 82%). The distribution of

Table -1- Characteristics of study population compared to population attending Center for Employment Training (CET).

Personal characteristics	Study population (n=300)		CET attendees (n=8225)		P-values
	n	%	n	%	
Sex					
Male	128	42.7	3934	47.8	0.04
Female	172	57.3	4239	51.5	
Age (years)					
<30	137	45.7	1748	21.3	<0.001
30-39	84	28.0	2457	29.9	
40+	79	26.3	1389	16.9	
Unknown	--	--	3231	39.3	
Education					
< High school	27	9.1	449	5.5	<0.001
High school	164	55.0	348	4.2	
Beyond high school	107	35.9	7321	90.3	
Unknown	--	--	417	5	

scores was quite skewed toward the lower end. Eighty percent of the participants received a score of 5 or less (30% correct) and only one subject scored 14/17 (82% correct). table 2 compares mean test scores for levels of age, education, language skill, place of birth, ever employed in the U.S., and prior OHS training by sex. Men and women differed significantly from one another with respect to birthplace and language skill. A greater percentage of males were born in an Arab country (62.5% vs. 26.7% in females) and whose language skill was in Arabic only (57% vs. 30.2% in females). For both men and women, higher scores were seen in those aged 40 or older, educated beyond high school, ever employed in the U.S. and having had previous OHS training.

Scores were higher among bilingual women and English only men. Scores were also higher for women born in a country other than the U.S. or an Arab country, while scores were higher for men born in the U.S. table 3 presents analysis of variance results for raw scores for each of the study variables stratified by sex. Mean test scores differed significantly for all study variables for men but not for women. Language skill, place of birth and employment had no effect on test scores in women. Of the significant associations for both men and women, education accounted for 15% of the variation in test scores in men and 11% in women. Language skill was significant in men only and accounted for 16% of the variation in test scores.

Table -2- Mean test raw scores results for age, education, language skill, place of birth, employment in U.S., and prior occupational health and safety training by sex.

Variables	Male		Female	
	N (%)	Mean (SD)	N (%)	Mean (SD)
Age (years)				
<30	51 (39.8)	3.2 (2.7)	86 (50.0)	3.3 (2.2)
30-39	44 (34.4)	3.8 (2.5)	40 (23.3)	4.8 (3.3)
40+	33 (25.8)	4.6 (2.9)	46 (26.7)	4.9 (3.1)
Education				
< High school	15 (11.8)	1.9 (1.5)	12 (7.0)	3.1 (2.5)
High school	65 (51.2)	3.4 (2.5)	99 (57.9)	3.4 (2.7)
Beyond high school	47 (37.0)	5.0 (2.8)	60 (35.1)	5.4 (2.8)
Language skill				
English only	46 (35.9)	5.2 (2.5)	117 (68.0)	4.2 (2.8)
Arabic only	73 (57.0)	3.1 (2.6)	52 (30.2)	3.6 (2.8)
Bilingual	9 (7.0)	2.1 (1.7)	3 (1.7)	6.7 (2.1)
Place of birth				
U.S.	40 (31.3)	5.3 (2.6)	112 (65.1)	4.2 (2.9)
Arab country	80 (62.5)	3.1 (2.6)	46 (26.7)	3.5 (2.7)
Other	8 (6.3)	3.9 (2.7)	14 (8.1)	4.7 (3.0)
Ever employed in U.S.				
Yes	86 (67.2)	4.2 (2.7)	109 (63.4)	4.3 (2.9)
No	42 (32.8)	3.1 (2.6)	63 (36.6)	3.7 (2.7)
Prior OHS training				
No	81 (63.3)	3.4 (2.7)	120 (69.8)	3.6 (2.7)
Yes	47 (36.7)	4.6 (2.7)	52 (30.2)	5.1 (3.0)

Table -3- Analysis of variance for raw scores and age, education, language skill, place of birth, employment in U.S., and prior occupational health and safety training by sex.

Variables	Male			Female	
	df	F	P-value	F	P-value
Age	2	2.62	0.08	6.23	0.002
Education	2	10.63	0.0001	10.44	0.0001
Language skill	2	11.73	0.0001	2.11	0.12
Place of birth	2	9.81	0.0001	1.31	0.27
Ever employed in U.S.	1	4.88	0.03	2.09	0.15
Prior OHS training	1	4.35	0.04	9.82	0.002

Discussion:

This cross sectional study evaluated the influence of age, education, language skill, place of birth, employment in the U.S. and prior OHS training on occupational health and safety knowledge in a currently unemployed, predominantly Arab American population. The results of our analysis document a very low level of OHS knowledge in this group. Our study supports the very few studies that have evaluated level of occupational health and safety knowledge in immigrant workers. Arcury et.al tested 270 Mexican immigrant agricultural workers on pesticide knowledge and found that 35% knew no modes of pesticide exposure ⁽¹⁰⁾. McMenamin interviewed 160 immigrants, working women and reported that the majority had little occupational health and safety training and awareness ⁽¹¹⁾. We found that for both men and women, individuals who were more educated had more occupational health and safety knowledge. Determinants of knowledge differed somewhat for men and women. Language skill and place of birth was important for men, but not for women likely due to the greater numbers of men born in an Arab country compared to women and the strong association of language with place of birth. Ever having worked in the U.S. was a factor in knowledge for men, but not women even though the numbers of men and women who had worked in the U.S. were similar. This study has several limitations and these results should be considered preliminary. First, the study sample was job seekers who had never received occupational health and safety training. It is likely that immigrants who have worked regularly in the workforce may have greater knowledge because of OHS training they would have received. However, the results of this study

provide evidence of the lack of OHS knowledge in a group of immigrants who are job seeking and emphasizes the need for training for this group. Second, we did not compare our study sample with a group of jobless Americans or other immigrant groups who may not yet be working. Whereas such a comparison would shed light on differences between immigrants groups or between immigrant groups and jobless Americans, the purpose of this analysis was to provide a preliminary description of Arab Americans, an immigrant group for whom less is known. Occupational health and safety knowledge determination was based on a limited number of items and the questionnaire was not previously validated. It is possible that this particular sample has additional OH&S knowledge that was not tested. We would expect, however, to have captured a breadth of OH&S knowledge due to the broad-based and open-ended questions. The bilingual questionnaire reduces the chance of inaccurate responses due to a language barrier. Our enrolled study population represented only 38% of target population, so selection bias should be considered. Perhaps individuals who volunteered may have had greater knowledge and therefore would have scored higher on the test. Our findings thus, may overestimate occupational health and safety knowledge of this population. Arab Americans job seekers are an understudied immigrant population with low levels of occupational health and safety knowledge. Whereas no knowledge or limited knowledge of English as well as educational level may contribute to lack of OHS knowledge, these are only partially explanatory. The results of this study call attention to Arab Americans as an additional immigrant population at

risk for workplace injury and illness. These findings emphasize the importance of overall educational level of workers to occupational health and safety knowledge. These findings also demonstrate the need for additional research because the significant predictors still only accounted for a modest amount of the low-level occupational health and safety knowledge in this population. Comparisons with other special populations should also be explored. Immigrants may face greater occupational risks due to their propensity to work in more hazardous jobs, their lack of health and safety preparedness, their communication difficulties, their reluctance to report injuries, and their lack of access to quality medical care. Efforts to educate such individuals about injury prevention, safe work practices, and their rights in the workplace could help reduce morbidity and mortality due to hazardous work. At-risk immigrant populations have not received adequate attention by the occupational safety and health research community, with the result that important unanswered questions remain about the optimal approach to prevention of occupational injury and illness. Thirty-five to forty million workers come from non-English language backgrounds ⁽¹²⁾. This suggests that a substantial number of workers who are faced daily with safety hazards may not understand their risks and how to reduce them and are thus at potentially greater risk for work-related injury or illness. More research is needed to more fully understand the determinants of knowledge acquisition, retention, attitudes and skills among Arab Am.

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