G. Knowledge, Beliefs, and Attitudes About Environmental Diseases Among Arab-American Communities in the Detroit Area

Adnan Hammad, PhD; Jerome O. Nriagu, PhD, DSc; Kathryn Savoie, PhD; Mary Johnson, BA, MS; Hikmet Jamil, MD, PhD

Introduction

Knowledge, attitudes, and beliefs about asthma can influence initial diagnosis, healthcare utilization, use of medication, and reduction of asthma risk factors in the household.[1–4] An intervention program to control or reduce the burden of environmental disease should begin with proper assessment of the attitudes, knowledge, and beliefs about the determinants of the particular disease within the community.

This paper describes the results of a baseline survey on these issues done before a household intervention program to reduce the burden and improve the management of asthma among the Arab-American community in Detroit, Michigan. This paper will discuss the impact of this baseline assessment on intervention success.

Methods

We used a 21-question instrument to explore participants' knowledge about risk factors for asthma. Participants were given a list of stimuli and asked to determine whether each item was a risk factor for asthma. For each stimulus, participants were asked whether it could make some asthma symptoms worse: "Yes," "No," or "I don't know." Each correct response was assigned one point, while incorrect responses or "I don't know" responses were assigned 0 points, which resulted in a minimum possible score of 0 and a maximum possible score of 21. Factors used to determine asthma knowledge score included dust; cockroaches; mosquitoes; mold, mildew, or fungus; tobacco smoke; hard, crisp, or crunchy foods; colds/flu; eggs; exercise; chocolate; pollen; air pollution; emotional stress or excitement; watching television; wood smoke (from a fireplace or stove); grass; rodents (mice or rats); cold or dry air; sudden weather changes; strong perfumes or air fresheners; and household cleaning products.

We also developed a series of questions to assess attitudes and perceptions about air quality problems in the community. Respondents were asked to rate overall air quality in the community as good, fair, or poor. Respondents were then asked about specific air quality issues such as annoying odors, black particles, poor visibility, and health effects of air pollution in the community. Respondents were asked if they had experienced each issue personally, and if so, how often: $<$1 day per month, 1–3 days per month, 4–6 days per month, 7–10 days per month, $>$10 days per month, or daily. Participants were also asked to rank their level of concern about each air quality issue in their community as not concerned, somewhat concerned, or very concerned.

Baseline questions about asthma knowledge and air quality issues in the community were asked of the 600 participants of the household survey described by Johnson.[5] Among the 160 households that completed the intervention, respondents were asked to answer the same asthma knowledge and air quality questions during the final household visit to determine whether intervention had successfully improved asthma knowledge and awareness among participants. Improvement was measured by comparing pre- and post-intervention asthma knowledge scores. A detailed description of household intervention methods is provided elsewhere.[5]

From the Community Health and Research Center, ACCESS, Dearborn (AH, KS, HJ); Department of Environmental Health Sciences, School of Public Health, University of Michigan, Ann Arbor (JN, MJ); Department of Family Medicine, Wayne State University, Detroit (HJ).

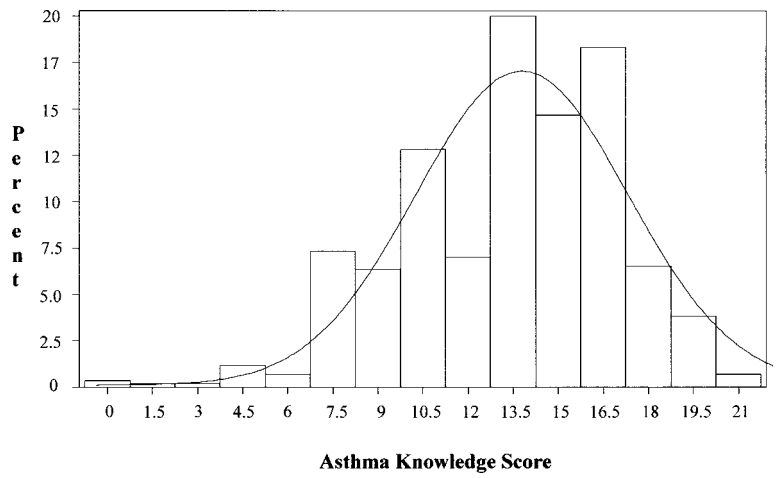

Fig 1. Asthma knowledge score in the survey population among household survey participants

RESULTS AND DISCUSSION

Asthma Knowledge Score

Asthma knowledge ranged from 0 to 21 with an average score of 13 in this study. Score distribution was skewed slightly to the right; most respondents (≈90%) were able to score >70% on this test (Figure 1). This finding suggests that the community had moderately good knowledge about asthma before the household intervention, which influenced subsequent selection of educational material. Respondents with a greater knowledge of asthma risk factors reported a greater number of health problems and more severe health problems, on average, than respondents with lower scores on the asthma knowledge test. This association was significant after adjusting for asthma status, which suggests that community members with greater understanding of asthma risk factors had a better awareness of and ability to discuss their own health problems.

Education level was positively associated with asthma knowledge (Beta=0.21, P=.001), while age was negatively associated with asthma knowledge (Beta=-0.25, P=.0047). Asthma knowledge also varied significantly with country of origin (P<.0001). Other factors such as sex, healthcare coverage, income, employment status, English fluency, household size, and length of residence in the United States were not significantly associated with asthma knowledge in the community (P>.05).

Table 1. Ranking of air quality issues in the community among household survey participants

	Good (%)	Fair (%)	Poor (%)
Overall air quality rating	38	28	24
	Not Concerned (%)	**Somewhat Concerned (%)**	**Very Concerned (%)**
Specific air quality issues			
Bad odor	20	19	60
Black particles	18	20	62
Poor visibility	29	22	48
Health effects	16	17	68

Perceptions of Air Quality in the Community

Awareness of and concern about air quality issues in the community was high (Table 1). Approximately 24% of the respondents thought the air quality was very poor, 60% were very concerned about annoying odors, and 60% were very concerned about atmospheric levels and deposition of black particles. Approximately 70% of the respondents expressed strong concern about the effects of air pollution on the health of the local community. Many respondents claimed that their health had been compromised by local environmental pollution, with 65% of study participants claiming that their health or that of someone in the family was affected 1–3 days per month, while approximately 7% said that air pollution affected their health daily. City of residence, household size, country of origin, spoken language, healthcare coverage, and education level were strongly correlated with level of concern about air pollution in the community (P<.05) (data not shown). These results suggest a great degree of concern about the health effects of pollutants from local industries, and that the community would be receptive to well-designed intervention programs aimed at reducing the burden of environmental diseases in the population.

Intervention Effects

Preliminary analysis suggests that household interventions increased the level of asthma knowledge among intervention participants. Baseline asthma knowledge score among intervention participants ranged from 0 to 20 with a mean score of 15, which suggests that asthma knowledge was slightly higher among intervention participants compared to the general population. This finding is not surprising, given that asthma status was positively associated

with asthma knowledge score and that the presence of asthma patients in the household was one of the selection criteria used in identifying households for subsequent intervention. Approximately 59% of the intervention participants showed improvement in their asthma knowledge score, which suggests that the intervention was successful in educating intervention participants about asthma risk factors. The association was negative between baseline asthma knowledge score and whether the score improved (OR=0.31, $P<.0001$); this finding suggests the household intervention might have produced more dramatic improvement among participants with a lower level of asthma knowledge at the beginning of the intervention.

Assessing knowledge and awareness of environmental disease and pollution issues in the community is critical to the success of environmental health intervention. Successful interventions are characterized not by novel intervention techniques, but rather by personalization of the intervention message to the target audience.[6] Preliminary assessment of asthma knowledge and awareness among Arab Americans in Metro Detroit allowed us to develop a personalized intervention strategy—at both the community and the household level—based on the knowledge and concerns of the community, which in turn led to a more successful intervention.

ACKNOWLEDGMENTS

Data are from a study funded by Grant #R25 10003-01A1 from the National Institute of Environmental Health Sciences (NIEHS), National Institutes of Health (NIH). Adnan Hammad, PhD, Principal Investigator.

REFERENCES

1. Clark NM. Advances in social, behavioral, and community aspects of asthma control. Paper presented at: National Conference on Asthma; June 19–21, 2003; Washington, DC.
2. Divertie V. Strategies to promote medication adherence in children with asthma. *Am J Matern Child Nurs.* 2002;27(1):10–18.
3. Huss K, Winkelstein M, Calabrese B, Rand C. Role of rural school nurses in asthma management. *Paediatr Drugs.* 2001;3(5):321–328.
4. van Weel C. Underdiagnosis of asthma and COPD: is the general practitioner to blame? *Monaldi Arch Chest Dis.* 2002;57(1):65–68.
5. Johnson M. Doctoral thesis in preparation. Ann Arbor, Mich: University of Michigan.
6. Fisher E. Community organization and peer coaches in reducing asthma disparities. Paper presented at: National Conference on Asthma; June 19–21, 2003; Washington, DC.