Now Hear This . . .

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Motivating Individuals to Wear Hearing Protection

Motivating individuals to wear hearing protection when exposed to noise remains an ongoing concern. We previously reported in the spring 2002 Now Hear This. . . newsletter about NIOSH's approach among construction workers to increase the use of hearing protection (www.oem.msu.edu).

Sandi Smith, the Director of Michigan State University's Health and Risk Communication Center recently completed a project studying the effectiveness of brochures to increase the use of hearing protection in two groups of workers; farmers, and landscape workers. The two industry specific brochures were developed using the principles of the Extended Parallel Processing Model of Persuasion (EPPM).

BACKGROUND

The EPPM proposes that messages should present a potential threat that recipients will feel is personally relevant and then show a relatively simple response that averts the threat. This presentation will then motivate intent to act in a way to reduce the threat. In other words, message recipients make appraisals of both the threat and efficacy perceived to be associated with the recommended response and make judgments about what outcome behavior will be enacted. The outcomes can range from no response at all, message rejection, or message acceptance.

The first step in the model is to induce threat of a hazard in the target population. According to the EPPM, perceptions of threat involve recipients both believing that the threat is severe and that they are susceptible to the threat. Here, the target groups must perceive that severe hearing loss is a threat for their population and that they are susceptible to hearing loss or they will not allocate further attention to the message. When a threat is considered to be trivial or irrelevant, there will be no motivation to continue message processing.

Once a threat is perceived, the next step in the EPPM is to induce perceived efficacy related to the threat. Perceived response efficacy is an individual's perception of the effectiveness of the recommended response. Perceived self-efficacy refers to an individual's perception of their ability to perform the recommended response. Both perceived response efficacy and self-efficacy make up the overall evaluation of the efficacy of the recommended response, and help to determine what processes the individuals will engage in. For these populations, self-efficacy involves the perception of ability to use ear plugs/ear muffs. Response efficacy refers to the perception that ear plugs/ear muffs will adequately protect against any future hearing loss.

If both perceived threat and efficacy are high, the EPPM predicts that people will engage in danger control processes. When perceived threat far outweighs perceived efficacy, however, people will engage in fear control processes. The goal of a persuasive message using the EPPM is to motivate individuals to engage in danger control processes, because it is here that they are performing the recommended responses in order to avoid the negative outcomes associated with the threat. The outcomes associated with danger control processes are protective motivation when individuals are motivated to adopt the recommended response and begin protecting themselves, as well as message acceptance. In the fear control process, people engage in denial, defensive avoidance, and reactance, in order to escape their fear. The outcomes associated with fear control processes include defensive motivation, or denial of the threat, and ultimately, message rejection.

The EPPM encourages danger control processes where individuals believe they can adequately make self-protective changes to avert the threat, such as using ear plugs/ear muffs in order to avoid future hearing loss that are based on perceptions of high threat coupled with high efficacy.

Both the farmers' and landscapers' brochures contained messages intended to make NIHL risk susceptibility and risk severity salient to the individual

population. The first panel of the brochure when opened contained risk susceptibility and risk severity messages about NIHL (e.g. “Landscape workers are at high risk for hearing loss!” and “Hearing loss is permanent and preventable”). The second and third panels contained a summary of the NIOSH and OSHA standards regarding noise level exposure, as well as images of pieces of equipment relevant to the population (i.e. tractors for farmers, leaf blowers for landscape workers) along with corresponding noise level measurements. The rear two panels featured further risk severity messages, and in keeping with the EPPM, messages intended to increase response efficacy and self-efficacy (e.g. “Hearing loss is one of the easiest hazards to protect against” and “You can begin to save your hearing today even if you have experienced some hearing loss by using formable foam plugs or earmuffs”). You can see the actual brochures at our website: www.oem.msu.edu. They can be downloaded to provide to your patients or we can send you a limited number of copies.

METHODS

Data collection began in December, 2005 and continued until May, 2006. Farmers were accessed through seminars sponsored by the Farm Bureau of Michigan. Landscape workers were accessed through a Pesticide Certification meeting and by contacting landscape departments of large organizations and local firms. Approximately one half of each group was given the survey and then presented with a brochure (control group), and the other half of each group was first given the brochure and time to read it before taking the survey (experimental group). The survey questionnaire that was used was adapted from the Risk Diagnosis Behavior Scale recommended in Effective Health Risk Messages: A step-by-step guide (Witte, Meyer, & Martell, 2001).

These procedures resulted in a sample of 111 farmers (58 control, 53 brochure) and 83 landscapers (41 control, 42 brochure). Of those, 103 farmers were male and 8 were female, and 75 landscapers were male and 7 were female. The average age for farmers was 49 and for landscapers was 39 years of age.

RESULTS

Hypothesis one predicted that farmers and landscape workers who received messages with severity and susceptibility of hearing loss components would rate threat of hearing loss in their occupation more highly that those who did not receive the messages. Analyses revealed that although farmers receiving the severity and susceptibility messages in the EPPM brochure did not perceive hearing loss as a greater threat than farmers in the control group (t (109) = 1.22, p = .22, r^2 = .01), the same was not true for landscapers. Landscapers in receipt of the EPPM brochure perceived hearing loss as a substantially greater threat than landscapers in the control group (t (81) = 5.30, p < .001, r^2 = .26). These results indicate that the landscaper data were indeed consistent with hypothesis one, even though the same was not the case for farmers.

Hypothesis two predicted that farmers and landscape workers who received messages with response and self-efficacy of hearing protection components would rate efficacy of using hearing protection more highly than those who did not receive the messages. Analyses demonstrated that farmers receiving the EPPM brochure containing messages with response and self-efficacy components were no more likely to perceive greater overall efficacy than farmers in the control group (t (109) = .98, p = .33, r^2 = .01). On the other hand, landscapers in receipt of the EPPM brochure reported perceiving hearing loss as a substantially greater threat than landscapers in the control group (t (81) = 6.76, p < .001, r^2 = .36). These analyses indicate that even though the farmer data were not consistent with hypothesis two, the landscaper data were.

Finally, hypothesis three predicted that farmers and landscape workers who received messages with threat and efficacy components would have higher intent to use hearing protection than would those who did not receive the messages. Intent was measured by the sum of two items measuring the intent to use hearing protection in the future. The distribution of the index was slightly negatively skewed: α = .75, M = 3.84, s = .86. Comparing levels of hearing loss prevention intent for EPPM brochure receiving farmers against control farmers revealed a statistically significant difference, (t (109) = 2.21, p < .05, r^2 = .04). The same, albeit larger, effect for the EPPM brochure on intent was also observed in landscape workers, (t (81) = 5.13, p < .001, r^2 = .25). These analyses indicated that the data for both farmers and landscape workers were consistent with hypothesis 3.

DISCUSSION

The failure of the *EPPM* brochure to create an effect in efficacy and threat for farmers was because farmers already had high efficacy and threat levels before exposure to the brochures. Therefore, it was difficult for the EPPM brochure to raise levels of those two variables further. Specifically, efficacy and threat levels in the control group farmers were at almost the same levels as EPPM brochure farmers. This is unlike the effect observed for landscapers where, although EPPM brochure landscapers had efficacy and threat levels on par with that of the EPPM brochure farmers, control landscapers reported substantially lower levels of efficacy and threat.

The ceiling effect in farmers could be due to previous efforts that have made farmers aware of potential

hearing loss in contrast to the landscaper population which has received less information about potential hearing loss.

A question that arises, then, is why the farmers who received the brochure, but did not rate threat and efficacy more highly than the control farmer condition, still indicated significantly higher intent to use hearing protection in the future. Here, the Health Belief Model (HBM) (Rosenstock, 1990) can be coupled with the EPPM. The brochure can be thought of as a cue to action from the HBM in that it is a stimulus that is designed to motivate the agricultural workers to engage in hearing protection, a healthy behavior. Redding, Rossi, Rossi, Velicer, and Prochaska (2000) note in their review of health behavior models "when perceptions of susceptibility and severity are high, a very minor stimulus may be all that is needed to initiate action". That is the case in this study as farmers had high perceptions of threat (made up of susceptibility and severity ratings) even before they saw the brochure. The brochure, then, may have served as that cue to action that was the stimulus that initiated their significantly higher intent to use hearing protection.

CONCLUSION

The results of this research add hearing loss in agricultural workers to this list of populations who have benefited from application of the EPPM to health hazards that they face. Practitioners would be well served to employ the EPPM constructs of threat (severity and susceptibility) and efficacy (response and self efficacy) to the construction of persuasive messages encouraging their patients to use hearing protection. This research shows that even when previous efforts to persuade the population have resulted in high threat and efficacy perceptions, the resulting messages might serve as cues to action that motivate the population to engage in healthy behaviors in the future. Practitioners can take away from this finding the reminder that they must strive to keep a continuing stream of persuasive material in front of their patients. Even when threat and efficacy are high, stimulus materials that might serve as positive cues to action are needed on a regular basis.

Reference

Redding CA, Rossi JS, Rossi SR, Velicer WF, and Prochaska JO. Health Behavior Models. The International Electronic Journal of Health Education 2000; 3:180-193.

Rosenstock I M. (1990). The health belief model: Explaining health behavior through expectancies. In K. Glanz, F. Lewis, F. Marcus, & B. Rimer (Eds.), Health Behavior and Health Education: Theory, research, and practice. San Francisco, CA: Jossey-Bass.

Witte, K., Meyer, G., & Martell, D. (2001) Effective health risk messages: A step-by-step guide. Thousand Oaks, CA: Sage.

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Michigan Law Requires the Reporting of Known or Suspected Occupational NIHL

Reporting can be done by:

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Suggested Criteria for Reporting Occupational NIHL

1. A history of significant exposure to noise at work; AND
2. A STS of 10 dB or more in either ear at an average of 2000, 3000 & 4000 Hz. And the employee's total hearing level is 25 dB or more at the same three frequencies. OR
3. A fixed loss.*

*Suggested definitions: a 25 dB or greater loss in either ear at an average of: 500, 1000 & 2000 Hz; or 1000, 2000 & 3000 Hz; or 3000, 4000 & 6000 Hz; or a 15 dB or greater loss in either ear at an average of 3000 & 4000 Hz.

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