FINAL REPORT

Title of Project:	How Do Consumers View the Risks of Medical Errors?
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1. Structured abstract (250 words maximum).

Purpose: To examine patient risk perceptions of medical errors in order to anticipate how patients will respond to medical-error reporting.

Scope: The Institute of Medicine estimated that 44,000-98,000 deaths each year in the U.S. result from hospital medical errors. Patients can play an important role in preventing these errors. Little is known, however, about how to effectively engage them in a role as a "vigilant partner" in care.

Methods: A well-established and robust risk-assessment methodology was used with a convenience sample (N=195). The theoretical framework assumes risk is subjectively defined by individuals influenced by a wide array of psychological, social, institutional, and cultural factors. Respondents were asked about risk characteristics as well as the perceived effectiveness of recommended actions for preventing medical errors.

Results: Patients perceived medical-error risks based on Dreadedness and Preventability. A model was built of the antecedents and consequences of worry about medical errors. Worry about medical errors was a better predictor of behavioral intentions than were estimated fatalities and rated likelihood of medical errors. Most recommended actions for preventing medical errors were viewed as effective. However, respondents indicated that they were unlikely to engage in many of the recommended actions. Having a greater sense of self-efficacy in being able to prevent medical errors and worrying more about medical errors both were linked with a greater likelihood of engaging in preventive action. An understanding of how self-efficacy and worry influence preventive efforts will help in building communication strategies to the public.

Key Words: medical errors, risk perception, patients

2. Purpose (Objectives of the study)

Developing effective strategies for measuring, reporting, and ultimately preventing medical errors is a high priority for health services research. Because it is understood that consumers can play an important role in prevention, it is critical to know how consumers view and understand the risks of different medical errors. In this project, we examined consumer risk perceptions in order to begin to anticipate how consumers will respond to medical error reporting as that process begins to unfold in communities.

Using a well-established and robust risk-assessment methodology, our objectives were (1) to determine how consumers perceive the risks of different medical errors and (2) to assess consumer willingness to engage in actions to prevent these errors. Strong relationships were predicted between the perceived risk of a medical error and the characteristics of the perceived risk (e.g., the degree to which that medical error is viewed as dreaded, preventable, observable, etc.). In addition, it was expected that consumers' willingness to perform actions to prevent medical errors (and their desire for government intervention) would be linked to the level of perceived risk and the perceived degree of preventability of the specific type of error.

Understanding how risky and how preventable consumers view different types of errors will be a necessary prerequisite to engaging consumers as partners in the effort to prevent errors.

3. Scope (Background, Context, Settings, Participants, Incidence, Prevalence).

The final report of the President's Advisory Commission on Consumer Protection and Quality in the Health Care Industry[1] identified medical errors as one of the four major challenges facing the nation in improving healthcare quality. Since that time, considerable attention and effort have been directed at understanding and preventing errors. The release of the Institute of Medicine report, *To Err is Human*, dramatically raised public awareness of the problem of medical errors; the Institute of Medicine estimated that 44,000-98,000 deaths each year in the U.S. result from hospital medical errors. Recent research also has shown that a substantial number of consumers have had first-hand or second-hand experience with medical errors.[2]

There is considerable evidence that the majority of medical errors, perhaps 70%, are preventable.[3] Care-delivery systems changes have been the focus of error-prevention activity. However, patients and their families can also play an important role in preventing medical errors. Patients and family members who are alert to the risk of errors can be more vigilant in monitoring what happens to them while in the hospital. By being informed and alert to their medication regimens, by ensuring medication accuracy on all orders, and by providing all pertinent information to staff, patients can be part of the team effort to reduce errors. When the information is available and they have a choice, consumers can also protect themselves by choosing hospitals with lower rates of complications and preventable deaths.

Two recent studies using consumer focus groups begin to explore the question of how consumers see their role in prevention.[4] One study exploring prevention of errors with consumers found that participants were generally aware of errors and did not consider them to be an unusual occurrence. However, participants were unable to identify factors critical to preventing errors in a hospital; they also could not determine whether they had received proper treatment.[5]

Little is known about how to tap into the potential resource that consumers and patients represent in error prevention. A key question is how to effectively engage consumers in this role as a "vigilant partner" in care. Communicating about errors is sensitive, and it is not clear how best to mobilize consumers to action without paralyzing them with fear or producing counter-productive behavior, such as avoiding care altogether. Although the media coverage tends to raise public alarm on the topic, the healthcare sector is perhaps going too far in the other direction of under-communicating about the problem. For example, the sensitivity of the topic has prompted the healthcare sector to use the term "patient safety," whereas the media talks about medical errors. Yet, it is not clear that the public even understands what the term "patient safety" means. If partnering with consumers in preventing errors is a priority, it is imperative that we find a way to communicate about it in a way that will be clearly understood.

The Agency for Health Care Research and Quality (AHRQ) has provided consumers with a list of actions that they can take to protect themselves from errors while in the hospital.[6] We know very little about the degree to which patients are willing to engage in these types of actions or how effective they are perceived to be in preventing errors. Findings from focus groups with Medicare beneficiaries indicate that there is reluctance to engage in some of the recommended actions.[7]

Having insight into how consumers view the risks of medical errors, how worried they are about them, how effective they perceive the recommended protective actions to be, and how self-efficacious they feel in protecting themselves are necessary first steps for crafting effective communication strategies aimed at the public.

The present study examines risk perception of medical errors using what has been called the psychometric paradigm.[8,9] This paradigm encompasses a theoretical framework that assumes risk is subjectively defined by individuals who may be influenced by a wide array of psychological, social, institutional, and cultural factors. It assumes that, with appropriate design of survey instruments, many of these factors and their interrelationships can be quantified and modeled in order to illuminate the responses of individuals and their societies to the hazards that confront them.

In this paradigm, psychophysical scaling and multivariate analysis techniques are used to produce quantitative representations or "cognitive maps" of risk attitudes and perceptions. Specifically, people are asked to make quantitative judgments about the riskiness of diverse hazards related to judgments about other properties, such as the hazard's status on characteristics that have been hypothesized to account for risk perceptions and attitudes (for example, voluntariness, dread, knowledge, controllability). Over the years, more than 100 studies of risk perception have employed this paradigm. These studies have shown that perceived risk is quantifiable and predictable. Psychometric techniques seem well suited for identifying similarities and differences among groups with regard to risk perceptions and attitudes. They have also shown that the concept "risk" means different things to different people. When experts judge risk, their responses correlate highly with technical estimates of fatalities. Lay people can assess fatalities if they are asked to (and produce estimates somewhat like the technical estimates). However, their judgments of "risk" are related more to other hazard characteristics (for example, lack of control, feelings of dread, threat to future generations); as a result, their assessments tend to differ from their own (and experts') estimates of annual fatalities.

We have very little knowledge about how to effectively communicate with the public about medical errors. Understanding how consumers view these risks and the actions recommended to prevent them is a first step.

4. Methods (Study design, Data sources/Collection, Interventions, Measures, Limitations)

Participants

Participants were a convenience sample of 195 people recruited through a flyer that was distributed to the University of Oregon's classified staff (mean age = 42 years, age range = 20 to 66years; 71% were women). Participants were primarily White (81.5%) and college graduates (55.4%).

Procedures

Participants were paid $15 for taking approximately 45 minutes to complete a two-part questionnaire. Half the participants completed the shorter Part I first; the other half completed Part II first.

Materials

In Part I, we examined whether worry was associated with fatality estimates of various causes of death, including medical errors. On the first page of a written questionnaire, participants were given as a guide or "anchor" the number of deaths per year in the U.S. from either a less common cause (appendicitis, 400 lives) or a more common cause (kidney disease, 40,000 lives) and were asked to estimate the number of deaths per year in the U.S. from a variety of other causes including medical errors, Alzheimer's, auto accidents, cancers, diabetes, heart disease, HIV/AIDS, homicide, influenza/pneumonia, Parkinson's disease, stroke, and suicide. On the following page, they were asked how worried or concerned they were about each cause of death on a scale from 0 = *not at all worried or concerned* to 6 = *very worried or concerned*.

In the longer Part II, participants first rated items concerning the likelihood that they would take 14 actions to prevent medical errors (e.g., "How likely are you to make sure that someone, such as your personal doctor, is in charge of your care during your hospital stay?). Responses on the 14 items were averaged to form the Preventive Action Index. The 14 preventive actions were selected from the Agency for Healthcare Research and Quality's 20 tips for avoiding medical errors and from those used in focus groups conducted by the Centers for Medicare and Medicaid Services.[10] Participants then were asked to evaluate 29 specific medical errors a patient could experience in the hospital. The set of errors began with four general errors (e.g., "a medical error that occurs during surgery") and continued with 25 more specific errors (e.g., "a patient is given unnecessary x-rays"). The set included errors of both commission and omission. Participants were asked to rate each of the 29 errors on measures of risk similar to those found important in previous studies.[8] There was a total of 11 measures. Each participant rated all 29 medical errors on five of the measures. In addition, all participants rated the 29 errors on the additional measure - Dread. Thus, each participant rated the 29 errors on six scales (Worry, Likelihood of noticing error, Patient preventability, Hospital preventability, Old or new risk, and Dread or Warning signal, Risk Likelihood, Extent of harm, Blame, Patient awareness, and Dread). We focused on the two independent measures — Dread and Patient Preventability — demonstrated to be the best representation of risk perceptions in this domain. We also focused on two dependent measures — Worry and Risk Likelihood. Half the participants rated the 29 medical errors on Dread, Patient Preventability, and Worry (n = 97); the other half rated the medical errors on Dread and Risk Likelihood (n = 98). These rating scales were adapted from previous studies.[9]

In addition, participants rated three behavioral intention items (e.g., "How likely would you be to change hospitals if you found out that your hospital had more than an average number of medical errors?"). We calculated the average across the three items to form a Strategic Action Index. They also answered an item about Government Regulation ("How necessary do you believe it is to have new government regulations to reduce the occurrence of medical errors?").

At the end of the survey, participants responded to a number of items assessing their reactivity to negative events (Behavioral Inhibition System [BIS] scale,[11] e.g., "Criticism or scolding hurts me quite a bit," "I worry about making mistakes."). Experiences in getting care, health status, and demographics were also part of the data collection.

5. Results (Principal Findings, Outcomes, Discussion, Conclusions, Significance, Implications)

The psychometric paradigm suggests that patients will have an organized perception of the risks of medical errors and that an understanding of these perceptions will help us build better risk communications to patients. In particular, past results lead us to expect two factors: one factor related to the dreadedness of the error and a second factor related to the patient's ability to prevent the error. These predictions were largely substantiated. In a factor analysis of perceived risk characteristics of medical errors, two factors emerged. Factor 1, labeled Dread, was composed of blame, harmfulness, hospital/staff preventability, patient awareness of risk, and dread. Factor 2 ,labeled Preventability, is patient oriented; patients can observe and prevent the error. High scores on Factor 1 relate to surgical errors, such as leaving an instrument in the patient; operating on the wrong patient or wrong limb, or unnecessarily on the heart; or just general errors in surgery. Low scores on Factor 1 relate to unnecessary lab tests or x-rays, a malfunctioning MRI machine, or a treatment that was not the most effective one. All these errors produce relatively less direct harm to the patient. High scores on Factor 2, on the other hand, relate to errors that patients could not be aware of, associated with problems during surgery or when unconscious, or errors with biopsy. Low scores on Factor 2 relate to problems the patient could detect and correct, such as wrong diet or problems with medications.

We then examined characteristics related to the likelihood to engage in preventive actions in two ways. First, a model was built of the antecedents and consequences of worry about medical errors. Greater worry about medical errors was associated with greater vulnerability to errors (older age and not being a White man) as well as with greater perceptions of errors as more dreaded and more preventable, and greater reactivity to negative events. Worry about medical errors was a better predictor of behavioral intentions than were estimated fatalities from medical errors and rated likelihood of medical errors. Second, we examined the perceived effectiveness of the recommended actions for preventing medical errors. Most recommended actions were viewed as effective. However, respondents also indicated that they were unlikely to engage in many of the recommended actions. Having a greater sense of self-efficacy in being able to prevent medical errors and greater worry about medical errors were linked with a greater likelihood of engaging in preventive action. An understanding of how self-efficacy and worry influence preventive efforts will help in building communication strategies to the public.

References

1. President's Advisory Commission on Consumer Protection and Quality in the Health Care Industry. Quality First, Better Health Care for All Americans. (Washington, DC, U.S. GPO, 1998).

2. Kaiser Family Foundation. National Survey on Americans as Health Care Consumers: An Update on the Role of Quality Information. (Menlo Park, CA, Kaiser Family Foundation, 2000)

3. L.L. Leape, et al. Promoting patient safety by preventing medical error. *Journal of the American Medical Association.* (1998) 280(16): 1444-7.

4. E. K. Swift, C. P. Koepke, J. A. Ferrer, and D. Miranda. Preventing Medical Errors: Communicating a Role for Medicare Beneficiaries. *Health Care Financing Review* 23(1):77-85 and VHA "*Consumer Demand for Clinical Quality: The Giant Awakens"* (Irving, TX: 14 December 2001).

5. See VHA, "*Consumer Demand for Clinical Quality: The Giant Awakens."*

6. 20 Tips To Help Prevent Medical Errors: Patient Fact Sheet. https://www.ahrq.gov/questions/resources/20-tips.html

7. See Swift, et al. Preventing Medical Errors: Communicating a Role for Medicare Beneficiaries.

8. Slovic, P. (1987). Perception of risk. Science, 236, 280-285.

9. Slovic, 2000. The Perception of Risk.

10. http://www.ahcpr.gov/consumer/20tips.htm and see Swift et al. Preventing Medical Errors: Communicating a Role for Medicare Beneficiaries.

11. Carver, C. S. & White, T.L. (1994). Behavioral inhibition, behavioral activation, and affective responses to impending reward and punishment: The BIS/BAS scales. Journal of Personality and Social Psychology, 67, 319-333.

6. List of Publications and Products

Hibbard JH, Peters E, Slovic P, et al. Can patients be part of the solution? Views on their role in preventing medical errors. *Joint Commission Journal on Quality and Safety* (in review).

Peters E, Slovic P, Hibbard J H, et al. Why worry?: The relation of perceived risk characteristics, worry, and behavioral intentions in medical errors. *Health Psychology* (in review).

Slovic P, Peters E, & Hibbard JH. How safe is the hospital? Perceived risks of medical errors. (in preparation)