



## Medical Decision Making

## Physicians' reactions to uncertainty in the context of shared decision making

Mary C. Politi<sup>a,\*</sup>, France Légaré<sup>b,c</sup><sup>a</sup> Department of Surgery, Washington University School of Medicine, St. Louis, MO, USA<sup>b</sup> Research Centre of the Centre Hospitalier Universitaire de Québec, Québec, Canada<sup>c</sup> Department of Family Medicine, Université Laval, Québec, Canada

## ARTICLE INFO

## Article history:

Received 10 May 2009

Received in revised form 21 September 2009

Accepted 26 October 2009

## Keywords:

Physicians' reactions to uncertainty

Shared decision making

Primary care

## ABSTRACT

**Objective:** Physicians' reactions towards uncertainty may influence their willingness to engage in shared decision making (SDM). This study aimed to identify variables associated with physician's anxiety from uncertainty and reluctance to disclose uncertainty to patients.

**Methods:** We conducted a cross-sectional secondary analysis of longitudinal data of an implementation study of SDM among primary care professionals ( $n = 122$ ). Outcomes were anxiety from uncertainty and reluctance to disclose uncertainty to patients. Hypothesized factors that would be associated with outcomes included attitude, social norm, perceived behavioral control, intention to implement SDM in practice, and socio-demographics. Stepwise linear regression was used to identify predictors of anxiety from uncertainty and reluctance to disclose uncertainty to patients.

**Results:** In multivariate analyses, anxiety from uncertainty was influenced by female gender ( $\beta = 0.483$ ;  $p = 0.0039$ ), residency status (1st year:  $\beta = 0.600$ ;  $p = 0.001$ ; 2nd year:  $\beta = 0.972$ ;  $p < 0.001$ ), and number of hours worked per week ( $\beta = -0.012$ ;  $p = 0.048$ ). Reluctance to disclose uncertainty to patients was influenced by having more years in formal education ( $\beta = -1.996$ ;  $p = 0.012$ ).

**Conclusion:** Variables associated with anxiety from uncertainty differ from those associated with reluctance to disclose uncertainty to patients.

**Practice implications:** Given the importance of communicating uncertainty during SDM, measuring physicians' reactions to uncertainty is essential in SDM implementation studies.

© 2009 Elsevier Ireland Ltd. All rights reserved.

## 1. Introduction

Scientific uncertainty results from numerous sources and can complicate clinical decisions. Experts conceptualize scientific uncertainty in many ways, including but not limited to: stochastic uncertainty (risk or probability of a future event); ambiguity (uncertainty about the strength or quality of risk estimates, resulting from conflicting study results or differences in study design used to calculate risk); uncertainty from unknown data; and uncertainty resulting from translating population level findings to individuals [1,2]. Communicating scientific uncertainty is essential for shared decision making (SDM) [3]. Nonetheless, discussions about uncertainty rarely occur in practice [4,5].

Most SDM implementation studies have not examined physicians' reactions to uncertainty, and do not provide information on physician characteristics that might foster SDM adoption [6].

Physicians who cope well with uncertainty may be more likely to support SDM [7]. Their responses to uncertainty may play a key role in uncertainty disclosure and willingness to engage in SDM [8]. Using data from a previous trial [9], we explored variables that were associated with physicians' anxiety from uncertainty and reluctance to disclose uncertainty to patients to better understand the relationship between these distinct variables and SDM adoption.

## 2. Methods

## 2.1. Data source and participants

Data originated from an SDM implementation study conducted in primary care practices in Québec City, Canada between September 2003 and April 2004. Clinical teachers and residents in family medicine who enrolled were asked to recruit five patients with whom a decision had been made and to provide post-clinical encounter data. Clinicians then attended a training session on SDM. They were subsequently asked to recruit five additional patients and provide the same post-clinical encounter data. Additional details about the original study are reported in a previous paper [9]. This study was approved by the Ethics

\* Corresponding author at: Health Communication Research Laboratory, Washington University in St. Louis, 700 Rosedale Avenue, St. Louis, MO 63112-1408, USA. Tel.: +1 314 935 3720.

E-mail address: [mpoliti@wustl.edu](mailto:mpoliti@wustl.edu) (M.C. Politi).

Committee of the five healthcare institutions where data collection occurred. All participants provided informed consent in writing. No financial compensation was provided.

## 2.2. Study measures

Data was collected through a self-administered questionnaire completed at study entry. Two subscales from the Physicians Reactions to Uncertainty (PRU) [10,11]: anxiety about uncertainty and reluctance to disclose uncertainty to patients (Cronbach alpha = 0.86 and 0.79 respectively) were included in this questionnaire. These scales are scored quantitatively by summing the items on each, with higher values indicating more anxiety about uncertainty and more reluctance to disclose uncertainty, respectively.

Explanatory variables included constructs of the theory of planned behavior [12] regarding the adoption of SDM in practice: intention, attitude, subjective norm, and perception of control (Cronbach alpha = 0.79, 0.85, 0.79 and 0.78 respectively). Socio-demographic variables, number of patients seen per week, and number of hours spent in professional activities were also assessed.

## 2.3. Data analysis

Descriptive analyses of participants were computed. Bivariate analysis was performed using Pearson correlation coefficient for continuous measures and *t*-tests or ANOVA for categorical measures. Stepwise linear regression analysis was used to test the relationship between each outcome of interest (anxiety and reluctance) and the explanatory variables. Analyses were conducted using SAS version 8.2.

## 3. Results

Sixty-seven clinical teachers (including one nurse practitioner and one dietician) and 53 residents enrolled (participation rate = 75%). Eligible non-participants were more likely to be male ( $p = 0.02$ ). There was no difference in training or practice status between participants and non-participants. Table 1 presents socio-demographics of participants.

Overall, the mean anxiety about uncertainty score was 14.96 (SD 4.75, range 5–26) and the mean reluctance to disclose uncertainty score was 12.14 (SD 4.27, range 5–25). There was a significant but weak correlation between the two subscales

( $r = 0.23$ ,  $p < 0.02$ ). In bivariate analyses pre-intervention, anxiety from uncertainty and reluctance to share uncertainty with patients were not associated with the intention to engage in SDM with patients ( $p = 0.64$  and  $p = 0.42$ , respectively), nor were any of the other constructs derived from the theory of planned behavior. However, reluctance to disclose uncertainty was significantly negatively related to intention to engage in SDM with patients ( $p < .02$ ) after the intervention.

In multivariate analyses, using the PRU as outcome variables, anxiety from uncertainty was influenced by female gender ( $\beta = 0.483$ ;  $p = 0.0039$ ), resident status (1st year:  $\beta = 0.600$ ;  $p = 0.001$ ; 2nd year:  $\beta = 0.972$ ;  $p < 0.001$ ), and hours worked per week ( $\beta = -0.012$ ;  $p = 0.048$ ). This model explained 30% of the variance in anxiety from uncertainty ( $F = 12.46$ ;  $p < 0.0001$ ). Reluctance to disclose uncertainty was influenced by having an additional graduate degree (other than an MD) ( $\beta = -1.996$ ;  $p = 0.012$ ). This second model explained 5% of the variance in reluctance to disclose uncertainty ( $F = 6.52$ ;  $p < 0.01$ ).

## 4. Discussion and conclusion

### 4.1. Discussion

This study described theory-based variables associated with physicians' reactions to uncertainty in the context of SDM. Findings showed that different variables related to physicians' reluctance to disclose uncertainty and their anxiety from uncertainty. The results can inform potential pathways for the successful implementation of SDM in clinical practice and reinforce the need to assess PRU in SDM implementation studies.

Holding one or more graduate degrees in addition to an MD (i.e., more years of formal education) was significantly associated with willingness to disclose uncertainty to patients, a key variable influencing intention to adopt SDM. Formal education in a specific field may allow physicians to explore ways to communicate uncertainty. Education could also help individuals feel more comfortable with concepts needed to communicate uncertainty (e.g. risks, probabilities). Further studies are warranted to explore this relationship and determine whether SDM interventions should incorporate aspects of education related to disclosure of uncertainty.

Female physicians reported more anxiety from uncertainty than male physicians. Although eligible non-participants were more likely to be male, possibly introducing a selection bias, these findings are consistent with previous studies [11,13–16]. Residents were also found to experience more anxiety about uncertainty than established physicians, consistent with past findings [17]. Medical experience may have an impact on physicians' reaction to uncertainty. In contrast, working more hours per week was significantly associated with less anxiety from uncertainty. It is possible that working more hours with more patients allows physicians to accept uncertainty inherent in most medical situations. It is also possible that physicians who experience more anxiety from uncertainty choose to work fewer hours. Future studies could inform us on the direction of this relationship and effective strategies to help physicians with varied levels of experience to cope with uncertainty.

### 4.2. Conclusion

The findings enrich our understanding of how physicians' reactions to uncertainty may impact the implementation of SDM in practice. Our study confirmed that the two subscales of the PRU – anxiety about uncertainty and reluctance to disclose uncertainty – are related but unique constructs with different implications for engaging in SDM. Prior to SDM training, there was no relationship

**Table 1**  
Characteristics of participants.

| Characteristics   | <i>n</i> = 122, mean $\pm$ SD or <i>n</i> (%) |
|---|---|
| Age (years)   | 35.5 $\pm$ 9.4                                |
| Gender  |   |
| Men   | 39 (32%)                                      |
| Women   | 83 (68%)                                      |
| Medical status  |   |
| Resident 1st year   | 32 (26%)                                      |
| Resident 2nd year   | 21 (17%)                                      |
| Professional <sup>a</sup>   | 69 (56%)                                      |
| Diploma other than MD   | 56 (46%)                                      |
| Number of years in practice<br>for clinical teachers ( <i>n</i> = 67) | 15.0 $\pm$ 8.6                                |
| Hours per week spent in<br>professional activities                    | 43.5 $\pm$ 12.6                               |
| Number of patients per week<br>seen in consultation <sup>b</sup>      | 37.0 $\pm$ 26.1                               |

<sup>a</sup> Includes one nurse practitioner and one dietetician.

<sup>b</sup> Excluding patients seen when on call: (a) for clinical teachers (*n* = 62): 45  $\pm$  28; (b) for residents (*n* = 44): 26  $\pm$  19.

between either of the subscales and intention to engage in SDM. The physicians enrolled in the study were all naïve to SDM at the baseline, thus none were likely to engage in the practice. After the intervention, physicians who were more reluctant to disclose uncertainty reported less intention to engage in SDM. Given that SDM requires clinicians to acknowledge and discuss uncertainty, reluctance to disclose uncertainty might lead clinicians to dismiss messages in SDM trainings. Reluctance to disclose uncertainty should be assessed before beginning SDM trainings to determine physicians' readiness to practice SDM.

Anxiety from uncertainty was not related to willingness to engage in SDM. It is possible that anxiety from uncertainty is a normal response to complex medical information, but can be managed at moderate levels in order to engage in SDM. Some level of anxiety might naturally result when individuals recognize the significance of uncertain medical choices [18]. However, very low levels of anxiety could lead clinicians to believe communication about choice is unnecessary, and very high levels of anxiety could lead to unwillingness to share this with patients and SDM rejection. Our study was not powered to look at a possible curvilinear relationship between anxiety from uncertainty and intention to adopt SDM, but future studies could investigate this possible pattern.

Additionally, the PRU scale has been studied as a physician trait that might influence decision making. Our results suggest that the PRU might be a modifiable outcome of interest. Anxiety from uncertainty could naturally fluctuate by specific clinical situations. Reluctance to disclose uncertainty, however, might be targeted in interventions to assess the impact of training physicians in SDM on their subsequent willingness to disclose uncertainty. It may also be useful to develop a scale assessing patients' reactions to uncertainty to assess the dynamic relationship between physicians' and patients' responses to uncertainty [1].

This study has limitations that need to be considered in the context of the findings. The secondary analysis of an existing dataset only allowed us to perform exploratory analyses. Additionally, the small sample may not be representative of the family physicians population.

#### 4.3. Practice implications

Variables associated with anxiety from uncertainty differ from those associated with reluctance to disclose uncertainty to patients. Some variables that were found to influence physicians' reactions to uncertainty may be amenable to change, while others may be used to tailor interventions. Given the importance of

communicating uncertainty during SDM, measures of physicians' reactions to uncertainty are essential in implementation studies of SDM.

#### Conflict of interest

The authors have no conflicts of interest to declare.

#### References

- [1] Politi MC, Han PKJ, Col NC. Eisenberg center 2006 white paper series: communicating the uncertainty of harms and benefits of medical interventions. *Med Decis Making* 2007;7:681–95.
- [2] Rockhill B. Theorizing about causes at the individual level while estimating effects at the population level: implications for prevention. *Epidemiol Soc* 2005;16:124–9.
- [3] Elwyn G, Edwards A, Kinnersley P, Grol R. Shared decision-making and the concept of equipoise: the competences of involving patients in healthcare choices. *Brit J Gen Pract* 2000;50:892–9.
- [4] Braddock C, Fihn S, Levinson W, Jonsen A, Pearlman R. How doctors and patients discuss routine clinical decisions. Informed decision making in the outpatient setting. *J Gen Intern Med* 1997;12:339–45.
- [5] Braddock CH, Edwards KA, Hasenberg NM, Laidley TL, Levinson W. Informed decision making in outpatient practice: time to get back to basics. *JAMA* 1999;282(24):2313–20.
- [6] Légaré F, Ratte S, Gravel K, Graham ID. Barriers and facilitators to implementing shared decision-making in clinical practice: update of a systematic review of health professionals' perceptions. *Patient Educ Couns* 2008;73:526–35.
- [7] Rogers EM, editor. Diffusion of innovations. New York: The Free Press; 1995.
- [8] Gordon GH, Joos SK, Byrne J. Physician expressions of uncertainty during patient encounters. *Patient Educ Couns* 2000;40:50–65.
- [9] Légaré F, O'Connor AM, Graham ID, Wells GA, Tremblay S. Impact of the Ottawa Decision Support Framework on the agreement and the difference between patients' and physicians' decisional conflict. *Med Decis Making* 2006;26:373–90.
- [10] Gerrity MS, DeVellis RF, Earp JA. Physicians' reactions to uncertainty in patient care: a new measure and new insights. *Med Care* 1990;28:724–36.
- [11] Gerrity MS, White KP, DeVellis RF, Dittus RS. Physicians' reactions to uncertainty: refining the constructs and scales. *Motiv Emotion* 1995;19:175–91.
- [12] Ajzen I. The theory of planned behavior. *Organ Behav Hum Decis* 1991;50:179–211.
- [13] Carney PA, Yi JP, Abraham LA, Miglioretti DL, Aiello EJ, Gerrity MS, et al. Reactions to uncertainty and the accuracy of diagnostic mammography. *J Gen Intern Med* 2007;22:234–41.
- [14] Carney PA, Elmore JG, Abraham LA, Gerrity MS, Hendrick RE, Taplin SH, et al. Radiologist uncertainty and the interpretation of screening. *Med Decis Making* 2004;24:255–64.
- [15] Tubbs EP, Elrod JA, Flum DR. Risk taking and tolerance of uncertainty: implications for surgeons. *J Surg Res* 2006;131:1–6.
- [16] Schneider A, Szecsenyi J, Barie S, Joest K, Rosemann T. Validation and cultural adaptation of a German version of the Physicians' Reactions to Uncertainty scales. *BMC Health Serv Res* 2007;7:81.
- [17] Bovier PA, Perneger TV. Stress from uncertainty from graduation to retirement—a population-based study of Swiss physicians. *J Gen Intern Med* 2007;22:632–8.
- [18] Janis IL, Mann L, editors. Decision making: a psychological analysis of conflict, choice, and commitment. New York, NY: Free Press; 1977.