

Influenza Vaccination and Decisional Conflict Among Regulated and Unregulated Direct Nursing Care Providers in Long-Term-Care Homes

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The purpose of this study was to determine whether direct nursing care providers have decisional conflict about receiving influenza vaccinations and characteristics associated with decisional conflict. The researchers used a self-administered questionnaire mailed to direct nursing care providers in two long-term-care organizations. Most direct nursing care providers in both organizations (80% and 93%, respectively) intended to get the influenza vaccine. Unregulated direct nursing care providers had more decisional conflict than regulated providers, especially related to feeling uninformed about the pros and cons of influenza vaccination. Unclear valuing of the pros and cons of influenza vaccination was related to the age of the direct care providers in both organizations. Decisional conflict and influenza vaccination practices may be determined, in part, by age and by the culture of a health care organization. A decision aid to improve knowledge and clarify values may improve decision quality and increase influenza vaccination rates.

Influenza is a contagious respiratory disease caused by viruses from the family Orthomyxo-

viridae. It is characterized by fever, cough, headache, muscle ache, rhinitis, and weakness, and sometimes abdominal pain, nausea, and diarrhea in children (Stohr, 2004). Its short incubation period and transmission through the respiratory route account for the rapid spread of influenza, especially in institutional settings, where attack rates are often more than 50% (Stohr). The severity of the disease is greatest in the elderly and other high-risk groups, including individuals with cardiac or pulmonary disease, metabolic diseases, or immunosuppression (Langley & Faughnan, 2004; World Health Organization [WHO], 2002). Of all influenza-related deaths, 80% to 90% occur among individuals older than 65 (Stohr). Disease prevention has long been considered the most effective

method of reducing influenza costs, and vaccination programs are cost-effective (WHO). Influenza vaccines protect against approximately 50% to 80% of clinical disease in healthy adults, and severe complications or death are reduced by 70% to 85% in older adults (WHO).

Vaccination campaigns have emphasized targeting the elderly. Although high vaccination rates are generally achieved for this population (90%), gaps in coverage still exist due to poor immunologic responses in older adults (National Advisory Committee on Immunization [NACI], 2006). Therefore, another method of protecting the elderly against influenza is by decreasing their exposure to the virus through vaccination of direct care providers (Arden, 2000). The two main reasons influenza vaccination is recommended for health care workers are to prevent transmission of disease among high-risk groups and to keep providers healthy (NACI; WHO, 2002). For these reasons and due to growing concern about a global influenza pandemic, the WHO has created a priority list of populations for whom influenza vaccination is recommended, including high-risk patient populations and health care workers in direct contact with high-risk populations (WHO). NACI has recommended a 90% coverage rate for health care workers, yet current vaccination rates for direct nursing care providers in long-term care range from 26% to 65% despite

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the accepted effectiveness of the influenza vaccine in the scientific community (Banerji et al., 2004; NACI; Russell, 2001; Stevenson, McArthur, Naus, Abraham, & McGeer, 2001).

Some studies have shown that among hospital-based health care workers, influenza vaccine use differs by job. Qureshi, Hughes, Murphy, and Primrose (2004) found that among various staff groups in an acute-care hospital setting, nursing staff had the lowest influenza vaccine use (23%). Within long-term-care homes, direct nursing care providers are classified as either regulated (e.g., licensed practical or registered nurses and nurse practitioners) or unregulated (e.g., patient care attendants) and have not been studied regarding differences in vaccine use.

Although many predictors of influenza vaccination have been identified, less research has focused on why these factors are predictive and how health care providers make decisions regarding whether to be immunized against influenza. One of the goals of the Ottawa Decision Support Framework is to guide the development of health care interventions that improve the quality of decision making by responding to modifiable determinants of decisions (Legare et al., 2003). Decisional conflict is a state of uncertainty about the course of action to take and an indicator of the level of comfort an individual experiences with a decision. It occurs when choices involve risky or uncertain outcomes, the need to make value tradeoffs between benefits and harms, and anticipated regret over the possible positive results of the option not chosen (Legare et al.; O'Connor, 1995). Modifiable factors contributing to decisional conflict include inadequate knowledge, unrealistic expectations, unclear values, unclear norms, unwanted pressure, inadequate support, and inadequate personal and external resources for making decisions about health (Legare et al.). To assess individuals' uncertainty with the decisions they are making and the reasons for that uncertainty, the Decisional Conflict Scale (DCS) was developed and validated (O'Connor et al., 1998). Once

the sources of conflict are identified, they can be reduced through decision support by tailoring information, clarifying values, or guiding deliberations and communication (Legare et al.).

The researchers hypothesized that direct nursing care providers in long-term care experience a high degree of decisional conflict, impeding acceptance of the influenza vaccine. Individuals with high levels of decisional conflict tend to postpone decisions. The purpose of this survey was to assess the level of and reasons for decisional conflict in a population of direct nursing care providers in two long-term-care home organizations. Identification of decision support needs among direct nursing care providers will aid in identifying areas to be targeted in future interventions, increasing influenza vaccination rates.

METHODOLOGY

Design

A cross-sectional survey was conducted to assess the presence of decisional conflict about receiving the influenza vaccine among regulated direct nursing care providers (registered nurses, licensed vocational nurses, and registered practical nurses) and unregulated direct nursing care providers (nursing assistants). The specific aims of the study were to determine whether direct nursing care providers have decisional conflict about receiving the influenza vaccine, the characteristics associated with decisional conflict (e.g., intent to receive the influenza vaccine in the upcoming influenza season), and whether levels of decisional conflict varied between long-term-care home organizations. The study was approved by the research ethics boards at each of the long-term-care home organizations and academic institutions involved.

Participants, Setting, and Questionnaire

During the 2004–2005 influenza season, a self-administered questionnaire was sent to direct nursing care providers in an Ontario long-term-care organization. It was part of an

annual influenza season information package, coordinated by the organization's Department of Occupational Health and Safety. The questionnaire consisted of three components: vaccination practices, the DCS, and staff demographics. This survey was also administered during the 2005–2006 influenza season in a Nova Scotia long-term-care home organization. Each organization employed 202 direct nursing care providers.

All direct nursing care providers were asked if they intended to receive the influenza vaccine this year, if they had received the influenza vaccine in the past year, and if institutional policies on influenza vaccination affected their decision to receive the influenza vaccine. Direct nursing care providers in Organization Two were also asked: "Do you believe the health care workers providing direct care to patients have a duty to receive the influenza vaccine?"

Decisional conflict was measured by the DCS. The DCS has 10 to 12 items, which combine to create four subscales. The subscales elicit the extent to which workers feel uncertainty about choosing among alternatives, uninformed about the pros and cons of a decision, unclear regarding their values, and unsupported in decision making. Each item is scored on a 3- to 5-point Likert scale. Final scores range from 0 to 100; a higher score indicates a higher level of decisional conflict. Scores of 38 or higher are associated with delays in decision making and scores of 25 or less are associated with active decision making. The scale has satisfactory reliability (test-retest reliability coefficient = 0.81) and discriminates between those who make and delay decisions (O'Connor, 1995).

Characteristics of direct nursing care providers collected in the questionnaire included gender, practice category, and age.

Analysis

Chi-square or Fisher's exact tests of statistical significance were applied to test for associations among characteristics of regulated and un-

Table 1

Characteristics of Regulated and Unregulated Direct Nursing Care Providers in Two Long-Term-Care Homes

Characteristic	Organization One			p	Organization Two			p
	% Regulated (n = 24)	% Unregulated (n = 29)	% Total (n = 76)		% Regulated (n = 36)	% Unregulated (n = 53)	% Total (n = 104)	
Gender								
Male	21	21	24	1.00	0	10	6	.08
Female	79	66	66		100	90	94	
Missing	-	14	10		-	-	-	
Total	100	101	100		100	100	100	
Practice category								
Regulated	-	-	31	NA	-	-	38	NA
Unregulated	-	-	38		-	-	62	
Missing	-	-	30		-	-	-	
Total	100	100	99		100	100	100	
Age (years)								
≤ 40	42	21	32	.136	17	37	30	.04
> 40	54	72	59		83	63	70	
Missing	4	7	9		-	-	-	
Total	100	100	100		100	100	100	

Note. Due to rounding, some totals may not equal 100. NA = not applicable.

regulated direct nursing care providers. Decisional conflict scores are reported as group means with standard error (*SE*). Independent two-tailed *t* tests were used to identify associations between decisional conflict (total and subscale scores) and intent to receive the influenza vaccine in the upcoming influenza season, age, and staff practice category. Two-tailed *t* tests were used because they provide for a more conservative estimate and permit detecting significant results that may be opposite those hypothesized. A post-hoc decision was made to collapse age (40 years or younger, older than 40 years) and practice category (regulated direct nursing care providers, unregulated direct nursing care providers) for the analysis to increase statistical power. Decisional conflict scores are reported separately for the two long-term-care organizations due to the heterogeneity of results. A *p* value of .05 or less was considered significant. Data analysis was performed using SPSS software (version 13.0; SPSS, Inc., Chicago, IL).

RESULTS

Personal Characteristics

In Organization One, 76 (38%) of 202 providers responded to the questionnaire. In Organization Two, 104 (51%) of 202 staff responded to the questionnaire (Table 1).

In Organization One, respondents were 66% female and 24% male; the rest did not report their gender. Thirty-one percent of respondents were regulated direct nursing care providers and 38% were unregulated direct nursing care providers; the remaining participants did not report their occupational category. The mean ages of regulated and unregulated direct nursing care providers were 47 years and 45 years, respectively. In Organization One, age and gender did not differ significantly between regulated and unregulated direct care providers ($p < .99$ and $p = .136$, respectively) (Table 1).

In Organization Two, respondents were 94% female. Forty-two percent of respondents were regulated direct nursing care providers and

62% were unregulated direct nursing care providers. Seventy percent of direct nursing care providers were older than 40. A significantly greater proportion of older regulated direct nursing care providers than unregulated direct nursing care providers ($p = .04$) existed in Organization Two. The distribution of males and females did not differ between regulated and unregulated direct nursing care providers in this organization (Table 1).

Influenza Vaccination Practices

Eighty percent of direct nursing care providers in Organization One and 93% in Organization Two reported they intended to receive the influenza vaccination in the coming year.

Seventy-six percent of direct nursing care providers surveyed in Organization One and 64% of direct nursing care providers surveyed in Organization Two reported they had been vaccinated the previous year.

Nine percent of direct nursing care providers in Organization One and 20% in Organization Two reported that their institutional policy affected whether they received the influenza vaccine.

Eighty percent of direct nursing care providers surveyed in Organization Two thought that receiving the influenza vaccine was their duty and 16% disagreed with the statement. This question was not asked of Organization One respondents.

Decisional Conflict

Mean total decisional conflict scores of direct care providers surveyed in Organization One ($M = 11$, $SE = 2$) were significantly lower than those in Organization Two ($M = 30$, $SE = 3$, $p < .0001$). Provider decisional conflict scores ranged from 12 to 87 in Organization One and from 0 to 69 in Organization Two.

Regulated and Unregulated Direct Nursing Care Providers. Unregulated and regulated direct nursing care providers in Organization One had mean decisional conflict scores of 37 and 22, respectively (Table 2). In Organization One, a lack of in-

formation created greater decisional conflict in the unregulated providers than the regulated providers (Table 2). Unregulated and regulated direct nursing care providers in Organization Two had means of 13 and 8, respectively (Table 2). In Organization Two, the higher decisional conflict in the unregulated group was related to a lack of information, unclear values, and lack of support (Table 2).

Age of Direct Care Providers.

Direct nursing care providers older than 40 in Organization One reported more decisional conflict in determining what was important in making this decision than those younger than 40 (Table 2). Direct nursing care providers older than 40 in Organization Two reported less decisional conflict in determining what was important in making this decision than those younger than 40 (Table 2). Also in Organization Two, those older than 40 felt more certain about the choice they had made.

Intent to Be Vaccinated. Direct care providers in Organization Two who did not intend to be vaccinated had higher levels of decisional conflict (i.e., determining what was most important to them) than those who intended to be vaccinated (Table 2). This was not true of direct care providers in Organization One (Table 2).

DISCUSSION

Decisional conflict is an important determinant of the quality of decision making. Direct nursing care providers must make high-quality decisions about whether to receive the annual influenza vaccine due to the high risk of influenza among older adults in long-term-care homes and the existence of an effective influenza vaccine in preventing transmission of the virus (Carman et al., 2000; Hayward et al., 2006; Potter et al., 1997). Low influenza vaccination rates among health care workers may indicate that high-quality decisions are lacking. Therefore, the decision support needs of those in contact with high-risk patient populations must be identified.

Explanations for the differences in decisional conflict and influenza

vaccination between the long-term-care organizations reported here may differ substantially. For example, the two organizations are in two provinces under different provincial regulations and policies, which may influence direct nursing care providers' views on influenza vaccination (Berta et al., 2005). The Ontario provincial government has had a policy of providing free universal influenza coverage since 2000–2001, whereas Nova Scotia does not, which may influence direct nursing care providers' decisions regarding vaccination. Research on using knowledge and evidence in health care points to organizational and social culture as major determinants of an individual's behavior (Lomas, 2004). For example, reports suggest that the lower decisional conflict and greater intent to be vaccinated within Organization Two may be due to the presence of a strong champion for influenza vaccination, who presented the message with conviction and with a credible and compelling vision (Medical Officer of Health, Capital Health Region, personal communication, May 2007). Additionally, influenza vaccination rates appeared to increase in this organization when the duty of care was emphasized among direct nursing care providers (Medical Officer of Health, Capital Health Region, personal communication, May 2007). This may explain the high percentage of direct nursing care providers in this organization who felt that being vaccinated was their duty (80%). Direct care providers who view influenza vaccination more as a professional obligation that meets professional ethical standards than as a question of personal preference may feel more confident with the decision they make (Orr, 2000).

These factors may have clarified the values of direct nursing care providers in this organization, thereby lowering their decisional conflict. In the other organization, polarization among direct care providers and the presence of individuals with strong anti-vaccination views may have contributed to the decisional conflict among direct nursing care providers

Table 2
Mean Subscale and Total Decisional Conflict Scores by Type of Direct Nursing Care Provider, Age, and Intent to Receive the Influenza Vaccine in the Upcoming Influenza Season

Long-Term-Care Home Organization	Predictor Variable	Decisional Conflict Subscales ^a					Total M (SE)
		What I Know (Information) ^b	What Is Important to Me (Values) ^c	How Others Help (Support) ^d	How Sure I Feel (Certainty) ^e		
		M (SE)	M (SE)	M (SE)	M (SE)		
Organization One	Regulated staff	21 (4)	21 (5)	26 (4)	17 (3)	22 (4)	
	Unregulated staff	36 (6)	37 (8)	37 (6)	28 (6)	37 (6)	
	<i>p</i> ^f	.06	.10	.13	.10	.07	
Organization Two	Regulated staff	6 (2)	7 (2)	9 (2)	8 (3)	8 (2)	
	Unregulated staff	13 (2)	13 (2)	16 (2)	11 (2)	13 (2)	
	<i>p</i> ^f	.01	.07	.05	.40	.08	
Organization One	≤ 40 years	21 (4)	18 (4)	35 (6)	21 (4)	24 (4)	
	> 40 years	34 (5)	36 (5)	30 (4)	26 (4)	32 (5)	
	<i>p</i>	.06	.02	.52	.46	.24	
Organization Two	≤ 40 years	16 (4)	16 (4)	17 (3)	18 (5)	16 (4)	
	> 40 years	8 (1)	9 (2)	12 (2)	7 (1)	8 (1)	
	<i>p</i>	.07	.06	.26	.04	.06	
Organization One	Intend to be vaccinated ^g	32 (4)	33 (4)	33 (3)	26 (3)	32 (4)	
	Do not intend to be vaccinated	19 (6)	19 (7)	28 (8)	20 (6)	23 (7)	
	<i>p</i>	.13	.17	.55	.52	.28	
Organization Two	Intend to be vaccinated ^g	10 (1)	10 (1)	13 (2)	10 (2)	10 (1)	
	Do not intend to be vaccinated	11 (4)	20 (6)	21 (11)	9 (5)	14 (6)	
	<i>p</i>	.72	.06	.48	.93	.38	

^aDecisional conflict subscale scores range from 0 to 100, with 0 representing no decisional conflict and 5 representing high decisional conflict. ^bInformation subscale items: Do you know which options are available to you; do you know the pros of each option; do you know the cons of each option? ^cValues subscale items: Are you clear about which pros are most important to you; are you clear about which cons are most important to you? ^dSupport subscale items: Do you have enough support from others to make a choice; are you choosing without pressure from others; do you have enough advice to make a choice? ^eCertainty subscale items: Are you clear about the best choice for you; do you feel sure about what to choose? ^fIndependent sample t test to compare means. ^gSurvey question: Do you intend to receive the influenza vaccination this year?

IN SUMMARY

Influenza Vaccination and Decisional Conflict Among Regulated and Unregulated Direct Nursing Care Providers in Long-Term-Care Homes

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- 1 Some direct care providers experience conflict when deciding whether to be vaccinated against influenza.
- 2 Decision-making needs of health care providers differ across organizations. Long-term-care organizations need to be aware of the decisional needs of their direct care providers and the influence of organizational culture on the decision of health care providers to be vaccinated against influenza.
- 3 Occupational health and safety interventions are necessary that address unresolved decisional needs by providing facts and clarifying personal values surrounding influenza vaccination. A decision aid about influenza prevention options may be a valuable addition to multifaceted occupational health programs aimed at increasing influenza vaccination among health care providers.

(Director, Occupational Health & Safety Services, SCO Health Services, personal communication, April 2006). Identification and mapping of the organizational culture within the long-term-care home organizations and its influence on influenza vaccination uptake may provide greater understanding of the contribution of all of these factors to the vaccination decision.

Being an unregulated direct nursing care provider was associated with more overall decisional conflict and decisional conflict related to feeling uninformed in both long-term-care home organizations (Table 2). The greater educational requirements for regulated direct nursing care providers may explain why the unregulated direct nursing care providers feel less informed than their regulated colleagues.

Within Organization One, direct nursing care providers older than 40 had greater decisional conflict about influenza vaccination than younger direct nursing care providers, espe-

cially in the area of clarifying their values surrounding the decision to be vaccinated against influenza (Table 2). In Organization Two, the trend was reversed, with younger direct nursing care providers experiencing more decisional conflict regarding valuing the advantages and disadvantages of influenza vaccination. A high score on the values decisional conflict subscale indicates that individuals are unclear about the relative degrees of importance of the attributes in a decision and the implicit tradeoffs they will be making in selecting an alternative (O'Connor, 1995). Thus, individuals with decisional conflict related to their values may not be clear whether cons such as the risk of potential vaccine side effects are more important to them than benefits such as protecting themselves and their patients against the influenza virus (Chapman & Coups, 1999; Doeblbeling, Edmond, Davis, Woodin, & Zeitler, 1997; Heimberger, Chang, & Shaikh, 1995; LeVela et al., 2004; Ludwig-Beymer & Gerc, 2002; Man-

uel, Henry, Hockin, & Naus, 2002; Martinello, Jones, & Topal, 2003; Mayo & Cobler, 2004; Quereschi et al., 2004; Smedley, Palmer, Baird, & Barker, 2002; Steiner, Vermeulen, Mullahy, & Hayney, 2002).

It may be that direct nursing care providers do not have sufficient information on the pros and cons of the influenza vaccine to make a high-quality decision, as indicated by the accompanying high decisional conflict scores in the area of information. Differences between younger and older direct nursing care providers may be due to cohort influences such as the quality and extent of information related to the influenza vaccine provided during their basic educations at the beginning of their nursing careers, as well as possible lack of effectiveness of continuing professional development events they have attended since receiving their basic educations. For example, a survey on the beliefs of midwives found that recent graduates are much less likely to view vaccination as an important public health measure than older graduates (Lee, Sashkin, McArthur, & McGeer, 2005). Studies have also found that older full-time health care providers are more likely to receive the influenza vaccine (Nichol & Hauge, 1997; Watanakunakorn, Ellis, & Gemmel, 1993).

Assessment of decisional conflict in a group of health science students contemplating influenza vaccination found that DCS scores discriminated between those who intended to accept, reject, or delay vaccination (O'Connor, 1995). In a study examining decisional conflict among health care employees at a teaching hospital and a visiting nursing agency, it was observed that higher DCS scores, elicited prior to being offered the vaccine, correlated with individuals rejecting or delaying the vaccine (O'Connor). More recently, the DCS was applied to a population of high-risk patients and high scores correlated with low self-reported influenza vaccination status (Mayo & Cobler, 2004). In the study reported here, however, direct nursing care providers who did not intend

to receive the influenza vaccine did not have statistically significant high levels of decisional conflict. This may be due to differences between patients and providers or reasons previously discussed (e.g., organizational influences).

Decisional conflict can also indicate anticipated regret with a decision. This is generally due to the uncertainty of outcomes—in this case, the effectiveness of the vaccine—and the potential loss of positive aspects of the rejected option (O'Connor, 1995). Anticipated regret may be a result of factors such as fear of potential side effects and needles, avoiding medications, or peer pressure to be vaccinated (Chapman & Coups, 1999; Doebbeling et al., 1997; Heimberger et al., 1995; LeVela et al., 2004; Ludwig-Beymer & Gerc, 2002; Manuel et al., 2002; Martinello et al., 2003; Mayo & Cobler, 2004; Quereshi et al., 2004; Smedley et al., 2002; Steiner et al., 2002). These results also may indicate that providers who do not intend to receive the vaccine are very comfortable with the decision they have made and multiple types of interventions may be required to alter their vaccination decision. Finally, reports of having received the vaccine may be correlated with other variables than reports of intending to receive the vaccine. For example, although 88% reported that they intended to receive the vaccine in the first long-term-care home organization, only 53% actually did; similar trends were reported in the second long-term-care home organization (Director, Occupational Health & Safety Services, SCO Health Service, personal communication, May 2006). A high level of commitment to receive the vaccine may be required to increase the likelihood of following through on one's intent (Janis & Mann, 1997).

Influenza vaccination rates among health care workers remain suboptimal despite interventions such as institutional policies, occupational health campaigns, and educational activities (Akiko et al., 2007; Goldstein, Kincade, Gamble, & Bearman, 2004). Research in this

area has not identified a single intervention as a panacea, but rather that a multifaceted approach must be taken to improve vaccine use among direct care providers (Goldstein et al.).

In this context, decision support for direct nursing care providers may be a necessary component of the intervention. Decision aids are interventions designed to help individuals make deliberate choices by providing personalized information about the relevant options and outcomes of a decision (O'Connor et al., 2003). They are intended to provide information, help individuals consider the personal value they place on benefits and harms of the options, and make individuals feel supported during the decision-making process to improve the quality of and satisfaction with the decision (O'Connor et al.). Given the decisional conflict observed among direct nursing care providers, a decision aid on influenza prevention options might clarify their understanding of and values surrounding influenza vaccination and influence their use of the influenza vaccine. An influenza vaccination decision aid is being developed for this group.

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