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CONCISE COMMUNICATION

Nurses' Intentions to Wear Gloves During Venipuncture Procedures: A Behavioral Psychology Perspective

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Registered nurses working at a teaching hospital in Kuwait were surveyed to assess the psychosocial variables associated with their intention to comply with glove-wearing recommendations. Perceived consequences and normative beliefs, as well as sex and years of nursing experience, significantly influenced their behavioral intentions, suggesting that improvements in intention to comply are more likely to come from practical demonstrations that show nurses the potential outcomes of both using and not using gloves.

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This article explores nurses' intention to follow strict infection control procedures that minimize the risk of infection from blood and fluids. As has already been noted in case studies from other countries,^{1,2} nurses at our hospital (Mubarak Al-Kabeer Hospital, Kuwait) are not consistent in the way they follow infection prevention guidelines.

Cross-cultural psychologist Harry Triandis³ developed a comprehensive theory of social behavior that has been applied to the study of health-related conduct. This theory suggests that a person's behavior with respect to their own well-being is the result of a complex interrelation among different social and psychological variables, such as personal and social expectations, motivations, and perceived consequences. Alternative psychosocial models of health-related behavior, such as the health belief model, the social learning theory, and Fishbein's theory of reasoned action, also provide a framework for understanding this behavior. However, Triandis's approach not only integrates the most influential variables of these other models, but also develops 2 simple equations to predict an individual's probability and intention of behaving in a way that creates a health risk.⁴

This study uses Triandis's second equation to understand the reasons that nurses decide to wear, or not wear, gloves during venipuncture procedures when contact with blood or fluid is possible. According to this second equation (where intention equals social factors plus affect plus perceived consequences), a nurse's decision to use gloves during venipuncture would be made as a result of considering (1) personal commitments and previous agreements with others to behave in a way that is seen as correct in the nurse's social context (ie, social factors), (2) the direct emotional response created by the thought of behaving in a particular way (ie, affect), and (3) the likelihood that the behavior will result in a particular outcome and the value the nurse gives to that outcome (ie, perceived consequences).

METHODS

Development of survey instrument. This research project consisted of 2 phases, each requiring a different methodology. The purpose of the first phase was to gather data on nurses' intent to use gloves during venipuncture by use of qualitative methodology techniques. Separate groups of 4 nurses (a total of 12 nurses, interviewed in groups) were asked to answer 14 open-ended questions designed to address each of the variables in Triandis's equation (ie, intention, social factors, affect, and perceived consequences). The nurses' answers were recorded as written notes by the interviewer (S.A.R.D.). The purpose of these in-depth interviews was to obtain information that was not confined by the rigid categories that characterize quantitative surveys. The material gathered was reduced into categories (or codes), and later into subcategories (or subcodes), to establish connections between the information provided by the different nurses. This process, known as content analysis, aims at finding concepts and themes within a discourse and interpreting them.

The second phase of the project consisted in measuring nurses' proclivity to use gloves during venipuncture. A questionnaire was developed on the basis of the issues that content analysis showed were meaningful to the nurses. Again, the questions were grouped in accordance with the variables in Triandis's equation. The final questionnaire consisted of 37 items: 10 for measuring the perceived consequences variable, 11 for social factors, 8 for affect, and 8 for intention. Scale-type answers were developed for the respondents. All scale items were coded from a 5-response Likert-type scale (with reverse-coding of negatively-worded items), except for the items that measured affect, which were coded from a 5-point semantic differential scale. Three items were included to collect information about demographic characteristics, including age, sex, and years of nursing experience. The final, precoded questionnaire that was developed was pretested with 10 nurses to assess its face validity and duration. Subsequently, minor adjustments were made to the wording of some questions. The questionnaire, details of which are available in the Appendix (online only), was administered to 50 nurses, and 49 returned the questionnaire. The questionnaire took approximately 15 minutes to complete.

Statistical analysis. Various characteristics of the items were looked at to identify floor or ceiling effects. Histograms of individual items as well as interitem correlations within each subscale were reviewed. If all of the nurses in the study group agreed or disagreed with an item, then it obviously would not help us discriminate among nurses, and thus was useless for the design of a reliable scale. This characteristic is referred to as "item difficulty," and those items that were highly skewed (ie, those for which more than 70% of respondents selected 1 of the 2 most extreme options) or had

TABLE 1. Summary of and Scores for Questionnaire Items Included in the Final Analysis

Triandis variable subscale, question	Score, median (IQR)	Subscale score, median (IQR)
Intention		3.2 (2.6-4)
I2. I will only wear gloves during venipuncture if I know the patient has a serious infection	2 (1-4)	
I3. I tell myself to use gloves each time I do the venipuncture procedure	4 (3-5)	
I5. Even if I am extremely busy I will wear gloves during venipuncture	4 (3-5)	
I6. Even if I have to walk to another part of the ward to get them, I will wear gloves during venipuncture	4 (2-4.5)	
I7. I will only wear gloves during venipuncture if it is a sterile procedure such as insertion of central venous line	2 (1-4)	
Perceived consequences		3.33 (2.67-3.83)
P2. Wearing gloves during venipuncture may cause me discomfort from allergy or wrong sizes	3 (2-4)	
P5. Wearing gloves will decrease my efficiency in performing venipunctures	4 (2-4)	
P6. Wearing gloves during venipuncture is a financial drain on the hospital	4 (2-4)	
P7. My wearing gloves during venipuncture increases patient confidence and tolerance of the procedure	3 (2-4)	
P8. Wearing gloves during venipuncture leads to a negative reaction from patients	4 (3-4)	
P10. If I wear gloves during venipuncture, I will gain approval from my colleagues	3 (2-4)	
Social factors		3.67 (3.17-4)
S1. I am the type of person that would always wear gloves during venipuncture	4 (3-4)	
S4. My colleagues recommend my wearing of gloves during venipuncture procedures	4 (3-4)	
S6. I have an obligation to my administrator/seniors to wear gloves during venipuncture	4 (2-4)	
S7. I owe it to my family to wear gloves during venipuncture	4 (2-5)	
S8. I have an obligation to infection control policy to wear gloves during venipuncture	4 (2-4)	
S11. As a role-model for junior staff, I will wear gloves during venipuncture	4 (3-5)	
Affect		3.83 (3-4.67)
The thought of wearing gloves during venipuncture makes me feel:		
A1. Anxious / not anxious	5 (3-5)	
A2. Not confident / confident	4 (3-4)	
A4. Out-of-control / in-control	4 (3-5)	
A6. Uncomfortable / comfortable	4 (3-5)	
A7. Unfocused / focused	3.5 (3-5)	
A8. Tense / relaxed	4 (3-5)	

NOTE. All scale items were coded from a 5-response Likert-type scale (with reverse-coding of negatively-worded items), except for the items that measured affect, which were coded from a 5-point semantic differential scale.

zero or nearly zero variances were excluded. Items with poor interitem correlations were also considered for exclusion.

Reliability and item analysis were used to improve the scale derived from the qualitative analysis and to evaluate the reliability of this scale. Because a reliable scale is made up of items that proportionately measure mostly true score, it would be better to select items that measure mostly intention and include few esoteric aspects that could be considered to be random error. To do so, the item-total correlation and the Cronbach α were calculated. The former is the correlation between a particular item and the total sum score (without the respective item), and the latter describes the internal consistency of the scale (coefficient α , proportion of true score variance that is captured by the items by comparing the sum of item variances with the variance of the sum scale [0 for

perfect error and 1 for perfect reliability]) if that particular item was excluded. The widely-accepted social science cutoff is that an item-total correlation less than 0.2 indicates that the item should be considered for discarding, and α should be 0.70 or higher for a set of items to be considered a scale.

Finally, exploratory analyses were conducted by use of a standard multiple linear regression model to identify the independent variables of the theoretic model associated with the intention of nurses to wear gloves during venipuncture. Statistica software, version 6 (Statsoft), was used for all analyses.

RESULTS

The majority (83%) of the nurses were women, about half were aged 35 years or older, and at least half had 10 or more

TABLE 2. Multiple Linear Regression Coefficients for Questionnaire Items and Demographic Characteristics Retained in the Second Backward Stepwise Regression

Variable	Unstandardized		<i>t</i>	<i>P</i>
	B (SE)	Standardized β		
Constant	-0.545 (0.747)		-0.730	.469
Item				
S1: I am the type of person that would always wear gloves during venipuncture	0.250 (0.102)	0.287	2.444	.019
S4: My colleagues recommend my wearing of gloves during venipuncture procedures	0.334 (0.102)	0.349	3.268	.002
P7: My wearing gloves during venipuncture increases patient confidence and tolerance of the procedure	0.276 (0.086)	0.364	3.211	.003
P8: Wearing gloves during venipuncture leads to a negative reaction from patients	0.245 (0.122)	0.202	2.004	.051
Characteristic				
Sex	-0.495 (0.268)	-0.191	-1.85	.072
Years of nursing experience	0.308 (0.170)	0.195	1.813	.077

NOTE. In step 9 of the backward stepwise regression, the dependent variable is intention scores; *P*-to-remove, 0.1; adjusted $R^2 = 0.54$.

years of nursing experience. On the basis of results of the item difficulty analysis, 11 items were excluded; 3 further items were excluded from subsequent analysis because the item-total correlation was less than 0.2 and exclusion of the item significantly increased the Cronbach α . For the included items (Table 1) the item-total correlations ranged from 0.24-0.68 and Cronbach α ranged from 0.64-0.77. Bivariate regression demonstrated a statistically significant linear relationship between all 3 subscale scores and intention.

The averaged intention scores (TI) for each nurse and the average scores for the 3 Triandis subscales and the 3 demographic variables (ie, age group, sex, and years of nursing experience) were entered into a backward stepwise linear regression model with TI as the dependent variable. Both the perceived consequences subscale and the social factors subscale were retained in this model and were positively related to intention, in addition to sex (with males more likely to have a positive intention) and years of nursing experience. When individual items in both of these subscales were entered into another backward stepwise regression (including sex and years of nursing experience), only items P7, P8, S1, and S4 (and both sex and years of nursing experience) were retained (Table 2).

DISCUSSION

To our knowledge, this study is among the first to assess the psychological factors influencing nurses' intention to use gloves during venipuncture procedures on the basis of a recognized theoretical framework. The Triandis theory and related theories of planned behavior have been successful in explaining a variety of human behaviors, including those related to the use of universal precautions among healthcare professionals.^{1,5} Using an established theoretical framework to assess the determinants of professional behaviors presents at least 3 advantages,^{6,7} which include providing a basis for comparison between similar studies, offering a sound meth-

odological approach that improves the internal validity of studies, and allowing for the development of strategies to improve the success of interventions to implement evidence-based practices.

Perceived consequences (ie, outcomes related to the work environment that facilitate support of the behavior) were found to be the most influential determinant of the intention to use gloves among the nursing staff. One plausible explanation is the fact that nurses do not really experience social pressure to wear gloves (ie, social factors do not play a major role in this choice), and because glove use is a routine part of their professional lives, it does not create any adverse effects on affect. Indeed, the intention to wear gloves has not been shown to be influenced by other important individuals, such as coworkers or supervisors.^{2,8} As such, it is likely that individual nurses will tend to adopt glove use more easily if they can clearly identify this behavior in terms of a positive outcome in the working environment. These work-environment outcomes, which may also be negative, are often dependent on previous experience,³ and this study clearly demonstrates that the nurses who scored high on intention were more likely to have had 2 favorable experiences related to glove use, as well as more years of nursing experience. The influential previous experiences were the observation of greater patient confidence and tolerance when gloves were used and the absence of a negative reaction to glove use from patients (Table 2).

It has been shown that perceived behavioral control is one of the most important factors affecting healthcare workers' intentions to adopt universal precautions.^{1,5,8} Physicians who had a positive perception of the behavioral norm had 15 times greater odds of having a strong intention to wear gloves, compared with physicians who had a moderate or negative perception of the norm.⁵ Perceived behavioral control reflects the underlying perceived consequences, because a perceived negative consequence may reduce perceived behavioral con-

trol over uncertainties and will have a negative impact on behavioral intention. In a similar fashion, perceived positive consequences will increase perceived behavioral control over uncertainties and will thus have a positive impact on intention.

Two normative beliefs held by the nurses were significantly related to intention. One of these was about what is normal (personal normative belief, S1), and the other was about what others do or what ought to be done (normative belief, S4). Although there is some evidence to support the idea that restructuring these normative beliefs can result in behavior change,⁹ it is unlikely that descriptive norms exert a direct influence on behavior.¹⁰ Rather, perceived benefits moderate the relationship between descriptive norms and behavioral intention.¹⁰ Therefore the finding that these normative beliefs of nurses resulted in increased intention likely relates to their desire not to deprive themselves of the perceived benefits that they believed their peers were deriving from wearing gloves. In other words, information about the widespread prevalence of a behavior is not sufficient to motivate change in intention, and the presence of adequately guided normative beliefs, by themselves, will not deliver sufficient incentives for change unless the nurses who hold the beliefs also have a clear vision of perceived possible consequences. In keeping with this concept, we found that the more experienced a nurse was, the more likely the nurse was to wear gloves.

Although limited by a relatively small number of subjects from 1 institution, this study does demonstrate that understanding the motivation underlying a given behavior in a specific situation may be one of the first steps to designing more efficient intervention programs for modifying behavior.⁵ Better compliance with glove use during venipuncture procedures was indeed associated with more perceived positive outcomes and less priority was assigned to affect or social factors other than normative beliefs. This pattern of results suggests that improvements in intention to comply are more likely to come from practical demonstrations that show nurses the potential outcomes of both using and not using gloves, and these results explain why better compliance has been associated with more informal feedback, compared with official policy statements or even feedback from more formal types of safety performance evaluation.¹¹

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