Lessons Learned From a Theory of Planned Behavior-Derived Study on Educational Interventions Inspired by the Affective Domain

Kathleen A. Russell-Babin, PhD, RN, NEA-BC, ACNS-BC

Abstract

Background: A paucity of literature exists on use of the affective domain to improve adherence to pressure injury prevention. The purpose of this study was to assess the use of emphasizing the cognitive domain versus education based on combination of the affective and cognitive domains focusing on medical–surgical nurses’ behavioral intent to use evidence-based practices to prevent pressure injury.

Method: A cluster randomized, controlled design was used to compare differences between groups. Medical–surgical nurses in units with low performance in pressure ulcer prevention were studied. A total of 77 nurses participated. This study employed the theory of planned behavior.

Results: Attitudes toward pressure ulcer predicted behavioral intent. Nurses who experienced the affective domain education showed improvements over the control group for attitude and perceived behavioral control.

Conclusion: Affective domain interventions have the potential to favorably impact nurses in valuing pressure ulcer prevention, despite any barriers.


It has been questioned whether nurses respond more strongly to educational messages that solely convey best practice guidelines (Haesler, 2014) or whether adding a story such as “a bed-bound, contracted lady with a very painful grade three pressure sore just above the cleft of the buttock” (Samuriwo, 2010, p. S10) would increase the likelihood of a change in practice. Securing nurses’ adherence to evidence-based guidelines is a major challenge. Frequently, the primary strategy to support and sustain changes in practice is education; however, it is unclear which educational methods best support the uptake of evidence. As evidence-based practice (EBP) can be considered both a learning and a sociopolitical endeavor, educational efforts need to go beyond cognitive strategies alone. As a noted expert in neuroscience said quite simply, “We only think about things we care about” (Immordino-Yang, 2016, p. 18). Yet, affective domain interventions rarely are included in an educational plan when evidence is being introduced into practice.

Literature Review

The Affective Domain

The first to construct the components of the affective domain were Krathwohl, Bloom, and Masia (1964), who postulated that learning in the affective domain begins with awareness and transitions to acceptance and a commitment to consistent practice. They noted that it is what one does in the face of attitudinal development that is important. The actions are progressive as one moves forward to receive, respond, value and commit, conceptualize, organize, and accept the value. As one continues on the path of attitudinal or values-based learning, it becomes painful to act otherwise.
Internalization of values is an important process in the work to increase adherence to EBP for improvement of patient care. In an extensive review of the literature on the affective domain, Shultz (2009) found that today’s concepts on the affective domain remain true to the foundational work of Krathwohl et al. (1964). More recent thinking sees the efficacy of educational efforts that merge strategies using both the cognitive and affective domains. As Ondrejka (2014) affirmed, the affective and cognitive domains are not mutually exclusive in learning.

The Affective Domain in Nursing

Research related to the development of the affective domain in nursing education is limited. In a comprehensive review of the literature on the affective domain in nursing, Shultz (2009) presented only 19 studies that were published in the 5 years preceding her publication. Explanations for the dearth of attention to the affective domain in the nursing literature include the difficulty in assessing it (Miller, 2010), perceptions of it as indoctrination (Krathwohl et al., 1964), and pervasive expectations that these educational efforts are resource intensive.

Nursing research related to teaching in the affective domain is limited to the areas of professional socialization, ethical issues, and organizational values, such as empathy development or appreciation of social justice (Brien, Legault, & Tremblay, 2008; Einhellig, Hummel, & Gryskiewicz, 2015; Neumann & Forsyth, 2008). As a result of affective domain interventions, students immersed themselves in the nursing role to support patients at the end of life (Brien et al., 2008), showed changes in attitude scores as a result of a poverty simulation experience (Einhellig et al., 2015), and responded favorably regarding the incorporation of institutional values (Neumann & Forsyth, 2008). A recent research project by Ward (2015) demonstrated the impact of simulated auditory hallucinations on students’ scores on the Medical Condition Regard Scale. Scores reflected gains in comprehension of the impact of hearing voices, echoing the theme of empathy development.

Taylor (2014) completed a qualitative study of nurse educators’ views on the affective domain; findings indicated the participants viewed it as the “heart of nursing” (p. 49). The participants believed that the affective domain has a positive impact on knowledge retention and comprehension, and they affirmed traditional areas for use of the affective domain, such as for empathy development. A primary modality used to encourage affective processing was reflection. Bulman, Lathlean, and Gobbi (2012) found that themes related to reflection included “making sense of the experience, ‘moving on’ and ‘doing better’” (p. e9), which represent the affective domain phase of internalizing.

Using the affective domain to drive action on evidence-based clinical practice has not been reported in the literature. Krathwohl et al. (1964) believed that as cognitive content becomes increasingly sophisticated, doses of affective learning are needed for learners to engage in learning. Evidence-based clinical practice requires a high level of learning to achieve practice change, and use of the affective domain may be a key support. A gap exists in research on effective application of affective domain strategies to produce EBP change in nursing. Further, no literature was found on improving adherence to pressure ulcer prevention guidelines through affective domain strategies for professional nurses.

Theory

Ajzen’s (1991) theory of planned behavior (TPB) guided this study. According to TPB, attitude, subjective norm, and perceived behavioral control (PBC) influence behavioral intent, which is a precursor of action. A key assumption is that attitudes and beliefs are learned and can be changed over time and experience. The presence and effect of attitudes, subjective norm, and PBC vary across different states or conditions (Ajzen, 1991).

Attitudes equate to the judgment of positive or negative regard of the action and are based in meaningful beliefs. Subjective norm is similar to the experience of peer pressure. Regardless of how strong the inclinations and no matter how supportive the subjective norm, actions can be impeded by other factors. These factors, such as resource availability and confidence, comprise the concept of PBC in the TPB model. Attitudes, subjective norm, and PBC may drive intention to act independently or as a combination (Ajzen, 1991). Fishbein and Ajzen (2010) stated:

We argue that human social behavior is really not that complicated, that people approach different kinds of behavior in much the same way, and that the same limited set of constructs can be applied to predict and understand any behavior of interest. (p. 2)

Fishbein and Ajzen (1975) noted that attitudes, subjective norms, and PBC are all grounded on beliefs. They posited that beliefs are created from information and result in behavioral intention. In the development of each of the three components shaping behavioral intention, humans must perform judgments that result in beliefs.

The TPB frequently is used for implementation of practice changes. Attitudes, subjective norms, and PBC can be thought of as part of the context of evidence-based change. The Promoting Action on Research Implementation in Health Services (PARIHS) framework for successful implementation of evidence into practice emphasizes the role of context (Kitson et al., 2008).
Several studies investigated the use of TPB in nursing. Kam, Knott, Wilson, and Chambers (2012) found that the combined factors of awareness of cancer referral sources, past referral practice, and the three TPB components explained 51% of the variance for behavioral intent to refer oncology patients for support services. Organ donation advocacy in intensive care nurses demonstrated an impact from educational programming supported by TPB (Lin, Lin, Chen, & Lin, 2014). A survey by McLaws, Maharlouei, Yousefi, and Askarinejad (2012) showed that components of the TPB influenced hand hygiene behaviors. Ben Natan, Faour, Naamah, Grinberg, and Klein-Kremer (2012) found that components of the TPB model partially influenced nurse and physician behavior in child abuse reporting. Different components of the TPB drive behavioral intent and subsequently behavior itself in different circumstances. The use of this theoretical framework in driving EBP change is a fertile field for further investigation.

Pressure Ulcers
As pressure ulcer prevention remains to be practiced at less than optimal levels in many organizations, it was chosen as the target of this work. An international clinical practice guideline noted that “pressure ulcers increase hospital costs significantly. In the United States, pressure ulcer care is estimated to approach $11 billion (USD) annually, with a cost of between $500 (USD) and $70,000 (USD) per individual pressure ulcer” (Haesler, 2014). Pressure ulcers incur pain, infection, and even death (Duncan, 2007). Qualitative studies have portrayed the deleterious effects of pressure ulcers, including, but not limited to, physical confinement, social isolation, varying degrees of pain, and a negative effect on emotional well-being (Gorecki et al., 2009; Langemo, Melland, Hanson, Olson, & Hunter, 2000). Cognitive educational strategies alone do not address this human experience well. The addition of the affective domain may be a helpful adjunctive in nursing education to produce improved patient outcomes.

STUDY PURPOSE AND RESEARCH HYPOTHESIS
Because there is a need to add to the research on the strength of the effects of the three components of the TPB (attitude, subjective norms, and PBC) on behavioral intent to perform an EBP change, the purpose of this study was twofold:

- To demonstrate the predictive strength of each component on behavioral intention to better guide future affective teaching strategies for EBP
- To determine whether an educational program containing both cognitive and affective components would result in higher behavioral intention than a program using only cognitive teaching strategies.

Fundamentally, the goal was to test the evidence-based affective domain intervention within the construct of a TPB-infused study. The two study hypotheses were (a) attitude, subjective norms, and PBC, uniquely and as a linear composite, are predictive of behavioral intention to prevent pressure ulcers, and (b) nurses experiencing EBP ulcer education adding the affective domain will have greater mean attitude, subjective norm, PBC, and behavioral intent scores than nurses experiencing a cognitive domain-based education program on EBP ulcer prevention.

METHOD
Research Design
The research design was quantitative and consisted of a cluster randomized, pretest–posttest control group methodology. Preexisting medical–surgical nursing units with high rates of pressure ulcer experience were randomized to different treatments. Randomization by groups was important to prevent contamination (Donner & Klar, 2004). A control group experienced cognitive domain inspired, evidence-based education and was compared with an experimental group that received both affective and cognitive domain oriented learning interventions based on evidence.

Sample and Sampling
The study setting was a five-hospital system in which three of the organizations were American Nurses Credentialing Center Magnet®-designated and 79% of nurses were nationally certified. Participants originated from six acute care medical–surgical units with higher than acceptable nosocomial pressure ulcer rates in 2013 as identified by National Database of Nursing Quality Indicators comparisons. The population of these six units constituted a total of 226 nurses available for the study. All bedside RNs were eligible. Exclusions included other units, such as intensive care and pediatrics, and other nursing personnel, such as assistive or clerical personnel. The investigator, a senior leader in the organization, distributed flyers to the nurses on the six units with study details and a request for volunteers to participate in the study.

Sample Size Projection
Sample size projections identified a need for 80 participants in each group for the multiple regression analysis and 64 in each group for the differences between groups. This included estimating a medium effect size (.30) with alpha of .05 and power = .80.

Instrumentation
The author created and tested a survey instrument that measured both direct and indirect attitudes, subjective
norm, PBC, and behavioral intent. The 48-item instrument was based on guidelines developed by international experts (Francis et al., 2004). The content of the instrument resulted from a qualitative study of acute care RNs on their responses to questions associated with attitudes, subjective norms, and PBC regarding pressure ulcer prevention reported elsewhere (Russell-Babin, 2013).

The instrument demonstrated acceptable results on test–retest analysis of agreement. Internal consistency was acceptable with a Cronbach’s alpha standardized score of .84. Three experts in the theory of planned behavior ascertained content validity by examination of the questions and confirmation of their relationship to the components of the theory. The experts concluded all elements matched the components of the theory as proposed. Two wound care experts confirmed face validity of the instrument in reflecting items related to pressure ulcer prevention.

Prior to the educational intervention for this study, each participant received a pair of instruments with matching identification numbers and the letters “A,” denoting the instrument was to be completed before the intervention, and “B,” denoting the instrument was to be completed after the intervention. Participants took up to 15 minutes to complete the instrument each time. The class was either 75 minutes or 90 minutes depending on whether the attendee participated in the control group or the experimental group, respectively.

Educational Intervention

In the years prior to this study, nurses received multiple attempts with online learning education to address their learning needs on pressure ulcer prevention. The six targeted units continued to demonstrate undesirable nosocomial pressure ulcer outcomes. As a result, this study used face-to-face education for both the intervention and control groups to solicit greater participant engagement through discussion.

Both groups received an EBP presentation on pressure ulcer prevention, based largely on the European Pressure Ulcer Advisory Panel and the National Pressure Ulcer Advisory Panel guidelines of 2009, which was the most recent version available. The additional educational intervention used in the intervention group was an exercise in the affective domain involving the behavioral objective of “discuss the patient experience of a pressure ulcer.” The available qualitative literature that elucidated the lived experience of pressure ulcers was used as a base for storytelling (Bale, Dealey, Defloor, Hopkins, & Worboys, 2007; Fox, 2002; Gorecki et al., 2009; Langemo et al., 2000).

The investigator created a composite of the experiences contained in the literature and a computerized graphic presentation with pictures reflecting the impact of pressure ulcers. Quotes from the articles corresponded to the pictures demonstrating impactful experiences such as “It is a really scary feeling to wake up and find you have lost half your buttock, actually part of your body. It’s gone...” (Langemo et al., 2000). The storytelling proceeded in a voice, tone, and method that promoted an emotionally impactful message.

The affective domain intervention followed the cognitive domain material. At the close of the affective domain intervention was a period of reflection, guided by open-ended questions.

Protection of Human Subjects

The study was approved by the institutional review boards (IRBs) of both the academic and health care system. Both IRBs granted a waiver of written informed consent. All nurse participants received an oral review of an informational flyer to explain the purpose of the research study. Completion of the surveys implied consent.

Data Analysis

Data were analyzed using SAS® version 9.2 software. The level of significance was set at \( p < .05 \). Statistics included descriptive statistics, multiple regression, and \( t \) tests.

Hierarchical multiple regression was used to test the theory, with intention entered as the dependent variable and the measures of attitude, subjective norm, and PBC entered as the independent variables. Stepwise regression overestimates the \( R^2 \) values and is not recommended (Smith, 2012). The analysis was a two-stage regression procedure starting with the means of the direct measures of the three explanatory constructs entered as independent variables and intention entered as the dependent variable; the indirect measures then were entered. By using this two-step method, the validity of the indirect measures was able to be assessed. In addition, differences between the direct and indirect measures and how much each type of measure contributed to the model could be examined.

The regression analysis assessed the intervention and the control groups separately to determine the strength of the effect of the independent variables on the dependent variable in each group. Independent \( t \) tests tested differences in behavioral intent between the two groups receiving different educational interventions.

The study used a repeated measures design with an additional predictor of treatment group to compare differences over time between the groups. The test of significance was the Wald \( Z \), a test to assess the contribution of predictors in regression (Field, 2005).
RESULTS

Sample Demographics

Seventy-seven of 226 eligible nurses completed all facets of the study. The control group included 42 nurses and the treatment group included 35 nurses. The average age was 42 years. The average length of nursing experience was 12 years, and the average length of tenure in the organization was 7.5 years. No statistical differences were found between the control and intervention groups regarding demographic variables. The distribution of education was not significantly different between groups, with 51% of participants possessing a bachelor’s degree in nursing.

Experimental Results

The first hypothesis was that attitude, subjective norms, and PBC, uniquely and as a linear composite, are predictive of behavioral intention to prevent pressure ulcers. To test this hypothesis, data from the comparison and treatment groups were individually subjected to hierarchical multiple regression analysis. In the control group, behavioral intent was significantly related to indirect attitude ($R^2 = .25$). In every model performed that was statistically significant on control group data, the main contributor was indirect attitude. The results of the regression analysis are shown in Table 1.

In the treatment group, direct attitude correlated perfectly with behavioral intent. In addition, relationships were demonstrated showing that direct attitude and direct PBC were associated with behavioral intent. Correlations demonstrating relationships between the domains for both the control and treatment groups are shown in Table 2. Although statistically significant, the correlations for subjective norm and PBC were low. The first hypothesis was partially supported as it was demonstrated that portions of the TPB were predictive of behavioral intent.

### Table 1

<table>
<thead>
<tr>
<th>Step and Predictor Variable</th>
<th>Control Group $R^2$</th>
<th>Δ$R^2$</th>
<th>Control Group $R^2$</th>
<th>Δ$R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct domains</td>
<td>0.037</td>
<td></td>
<td>0.267</td>
<td></td>
</tr>
<tr>
<td>Direct domains + indirect attitude</td>
<td>0.246</td>
<td>0.210*</td>
<td>0.341</td>
<td>0.073</td>
</tr>
<tr>
<td>Direct domains + indirect subjective norm</td>
<td>0.045</td>
<td>0.008</td>
<td>0.282</td>
<td>0.015</td>
</tr>
<tr>
<td>Direct domains + indirect perceived behavioral control</td>
<td>0.091</td>
<td>0.054</td>
<td>0.313</td>
<td>0.045</td>
</tr>
<tr>
<td>Direct domains + indirect attitude and indirect subjective norm</td>
<td>0.250</td>
<td>0.214*</td>
<td>0.242</td>
<td>−0.025</td>
</tr>
<tr>
<td>Direct domains + indirect attitude + indirect perceived behavioral control</td>
<td>0.247</td>
<td>0.210</td>
<td>0.418</td>
<td>0.151</td>
</tr>
<tr>
<td>Direct domains + indirect subjective norm and indirect perceived behavioral control</td>
<td>0.098</td>
<td>0.061</td>
<td>0.327</td>
<td>0.060</td>
</tr>
<tr>
<td>Direct domains + indirect attitude + indirect subjective norm + indirect perceived behavioral control</td>
<td>0.250</td>
<td>0.214*</td>
<td>0.421</td>
<td>0.154</td>
</tr>
</tbody>
</table>

Note. Direct attitude was not an applicable direct domain for the treatment group due to perfect correlation with behavioral intent. * $p < .05$.

### Table 2

<table>
<thead>
<tr>
<th>Group</th>
<th>Attitude</th>
<th>Subjective Norm</th>
<th>Perceived Behavioral Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subjective norm</td>
<td>0.467*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived behavioral control</td>
<td>0.355*</td>
<td>0.199</td>
<td></td>
</tr>
<tr>
<td>Behavioral intent</td>
<td>−0.033</td>
<td>0.126</td>
<td>0.044</td>
</tr>
<tr>
<td>Indirect measure</td>
<td>0.116</td>
<td>0.033</td>
<td>0.032*</td>
</tr>
<tr>
<td>Treatment group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subjective norm</td>
<td>−0.109</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived behavioral control</td>
<td>0.51*</td>
<td>−0.047</td>
<td></td>
</tr>
<tr>
<td>Behavioral intent</td>
<td>1.00**</td>
<td>−0.109</td>
<td>0.51*</td>
</tr>
<tr>
<td>Indirect measure</td>
<td>0.488*</td>
<td>−0.16</td>
<td>0.38*</td>
</tr>
</tbody>
</table>

* $p < .05$. ** $p < .01$. 

The Journal of Continuing Education in Nursing · Vol 48, No 12, 2017
The second hypothesis was that nurses in the treatment group would have higher mean scores for attitude, subjective norm, PBC, and behavioral intent than those experiencing only cognitive domain-based education programs on pressure ulcer prevention. A between-groups repeated measures design assessed both the treatment and time differences.

The treatment group demonstrated larger increases than the control group in all domains over time. Indirect attitude and indirect PBC approached significance (\( p = .05 \) for both), with the treatment group having scores almost 8 points higher than the control group for these domains. Changes in behavioral intent scores were minimal and not significant (\( p = .90 \)) (Table 3). The results of assessing the difference between the Time A and the Time B raw mean scores for both groups and then comparing the differences between groups are shown in Table 3. For example, for the control group, the Time A raw mean score for direct attitude was 6.82 (SD, .74) and the Time B raw mean score was 6.98 (SD, .09). This resulted in a time effect of .17.

Scores for the treatment group were calculated similarly. The difference in scores between groups was .003. This result, as with all the scores, was not significant. The second hypothesis was not supported. Of note, in simple linear regression with direct domains, both attitude and PBC demonstrated significantly stronger relationships to behavioral intent in the treatment group compared with the control group (Table 4). Overall, behavioral intent was difficult to influence as nurses scored it so consistently high in attitude and subjective norm at Time A. Table 5 shows where the means were exceptionally high for both groups.

**Comparison of Classroom Evaluations**

Nurses in the class with the affective domain reflection exercise used different words to evaluate their learning than nurses in the class taught strictly from the cognitive domain. Those in the cognitive domain-structured class described the class as “informative,” “interesting,” “useful,” “very good,” “helpful,” “great expansion of existing knowledge,” “necessary,” and “insightful.” Those in the class with the additional affective domain exercise added comments including “fulfilling,” “excellent-enlightening,” and “eye opening.” This group also added more description to their evaluation such as “I was surprised how much I learned,” “touching comments,” and “great learning experience.” In contrast, the traditional cognitive-designed class simply called the class “good and clean,” “informative,” and “great.”

### DISCUSSION

The results of this study demonstrated that although direct attitude and PBC may drive intent to prevent pressure ulcers, subjective norm did not add to the equation. The fact that subjective norm did not contribute to the regression models in either group may be a result of social pressures, socialization, or instrument construction. It is common for only portions of TPB to be supported. In both studies, subjective norm had a low impact on behavioral intent. The second hypothesis was not supported; this may have been due to the high levels of attitude in both groups at Time A. Methodical limitations also may have contributed to this result because randomization was to the group and not to the individual. This choice was made to prevent contamination of the groups. The sample size was smaller than anticipated despite adding additional class offerings, thus lowering the power of the study. Actual behavior was not measured but was represented by the proxy measure of pressure ulcer prevention.

### Table 3

**Comparison of Treatment and Control Groups’ Differences Between Time A and Time B**

<table>
<thead>
<tr>
<th>Domain</th>
<th>Time Effect Control</th>
<th>Time Effect Treatment</th>
<th>Difference in Scores 95%CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td>0.17 [–0.05, 0.38]</td>
<td>0.21 [0.03, 0.39]</td>
<td>–0.003 [–0.05, 0.05]</td>
</tr>
<tr>
<td>Subjective norm</td>
<td>0.25 [0.09, 0.41]</td>
<td>0.54 [0.30, 0.79]</td>
<td>0.21 [–0.03, 0.45]</td>
</tr>
<tr>
<td>Perceived behavioral control</td>
<td>0.23 [–0.02, 0.43]</td>
<td>0.29 [–0.03, 0.60]</td>
<td>0.05 [–0.34, 0.45]</td>
</tr>
<tr>
<td>Indirect attitude</td>
<td>3.69 [–2.5, 9.88]</td>
<td>8.94 [0.69, 17.2]</td>
<td>7.89 [–1.14, 15.91]</td>
</tr>
<tr>
<td>Indirect subjective norm</td>
<td>9.05 [4.9, 13.2]</td>
<td>11.89 [1.56, 22.22]</td>
<td>3.47 [–10.8, 17.77]</td>
</tr>
<tr>
<td>Indirect perceived behavioral control</td>
<td>–2.93 [–7.3, 1.41]</td>
<td>3.61 [–2.88, 10.09]</td>
<td>7.87 [–1.14, 15.88]</td>
</tr>
<tr>
<td>Behavioral intent</td>
<td>0.05 [–0.48, 0.14]</td>
<td>0.07 [–0.01, 0.14]</td>
<td>–0.01 [–0.08, 0.07]</td>
</tr>
</tbody>
</table>

Note. CI = confidence interval. * \( p < .05 \).
behavioral intent. The effects of close testing and retesting periods also cannot be discounted; blinding also was not possible. Demographic factors such as age or education were not entered into the model, and data about resources were not collected.

Because the “dose” of the intervention needed in terms of strength or time is not known, it could be that the dose of the intervention may not have been enough. The literature did not suggest the time needed to provide a reflective exercise that could produce an effect. It also is possible that time is not the issue, but rather the degree of impact provided by the intervention. The tight time constraints that exist in hospitals to educate nurses limited the intervention. Most of the participants attended class during their shift; thus, it was important to make the intervention both time efficient, as well as impactful.

Another option for making the intervention impactful would be the firsthand recounting of a pressure ulcer experience by a previous patient of the facility or a simulated experience. Videotaped interviews of patients who shared their pressure ulcer experience could be included, with the recording ensuring that availability of the source would be consistent and could be used in online instruction.

### TABLE 4

**COMPARISON OF LINEAR REGRESSION BETA ESTIMATES AND DEGREE OF BETA DIFFERENCE BETWEEN CONTROL AND TREATMENT GROUPS**

<table>
<thead>
<tr>
<th>Model</th>
<th>Control Group Estimate</th>
<th>Treatment Group Estimate</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct only</td>
<td>–0.06</td>
<td>1.33</td>
<td>1.39**</td>
</tr>
<tr>
<td>Direct and indirect attitude</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct</td>
<td>–0.09</td>
<td>1.33</td>
<td>1.42**</td>
</tr>
<tr>
<td>Indirect</td>
<td>0.004</td>
<td>0.00</td>
<td>–0.004*</td>
</tr>
<tr>
<td>Subjective norm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct only</td>
<td>0.03</td>
<td>–0.04</td>
<td>–0.07</td>
</tr>
<tr>
<td>Direct and indirect subjective norm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct</td>
<td>0.03</td>
<td>–0.03</td>
<td>–0.06</td>
</tr>
<tr>
<td>Indirect</td>
<td>0.0002</td>
<td>0.001</td>
<td>0.001</td>
</tr>
<tr>
<td>Perceived behavioral control</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct only</td>
<td>0.02</td>
<td>0.10</td>
<td>0.09*</td>
</tr>
<tr>
<td>Direct and indirect perceived behavioral control</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct</td>
<td>0.001</td>
<td>0.10</td>
<td>0.10*</td>
</tr>
<tr>
<td>Indirect</td>
<td>0.002</td>
<td>0.001</td>
<td>–0.001</td>
</tr>
</tbody>
</table>

*p ≤ .05. **p ≤ .01.

### TABLE 5

**MEANS AND STANDARD DEVIATIONS BY DOMAIN FOR CONTROL AND TREATMENT GROUPS**

<table>
<thead>
<tr>
<th>Group/Time</th>
<th>Attitude, M (SD)</th>
<th>Subjective Norm, M (SD)</th>
<th>Perceived Behavioral Control, M (SD)</th>
<th>Behavioral Intent, M (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control time A</td>
<td>6.82 (0.74)</td>
<td>6.23 (0.63)</td>
<td>5.92 (0.95)</td>
<td>6.93 (0.27)</td>
</tr>
<tr>
<td>Control time B</td>
<td>6.98 (0.09)</td>
<td>6.48 (0.60)</td>
<td>6.15 (0.89)</td>
<td>6.97 (0.15)</td>
</tr>
<tr>
<td>Treatment time A</td>
<td>6.77 (0.56)</td>
<td>6.14 (0.81)</td>
<td>5.95 (0.79)</td>
<td>6.91 (0.24)</td>
</tr>
<tr>
<td>Treatment time B</td>
<td>6.98 (0.13)</td>
<td>6.71 (0.47)</td>
<td>6.19 (0.87)</td>
<td>6.97 (0.17)</td>
</tr>
</tbody>
</table>
The investigator, a senior nursing leader, taught all of the classes and administered the pre- and posttests. Because the participants did not report directly to the investigator, and she was not well known to them, this potential limitation for the study was minimized.

The significance of the study is founded within the concept that attitudes are considered a precursor to changes in behavior in TPB (Ajzen, 1991), and a short intervention, based on TPB, was able to demonstrate change in attitude and PBC. The study demonstrated that the modest intervention can influence behavioral intent. Improvement in attitude and PBC toward evidence-based prevention of pressure ulcers should have an effect on clinical practice and outcomes. Improving uptake and adherence of evidence-based prevention strategies through attention to the affective could play a role in preventing pressure ulcers. Improved performance on pressure ulcer development would reduce patient suffering and also assist acute care facilities in meeting today's value-based purchasing metrics, adding to customer loyalty and improved financial performance. Educators should consider the addition of affective domain driven activities into educational programming.

This research may spur other educators to perform much-needed research in the affective domain. Recommendations for future studies include modifying the dose to attempt to achieve stronger behavioral outcomes and assessing patient outcomes related to the changes in intended behavior.

CONCLUSION

The outcomes of an affective domain educational intervention in the evidence-based prevention of pressure ulcers by nurses have not been described previously. Statistically significant increases in treatment group scores resulted for attitude and PBC. Although this study only reported on the first two levels of Kirkpatrick's levels of learning evaluation; for example, reactions and potentially learning of attitudes (DeSilets, 2009; Suskie, 2009); it gives support to the benefit of adding educational interventions from the affective domain to complement cognitively derived education.

Immordino-Yang (2016) asserted, “It is literally neurobiologically impossible to build memories, engage complex thoughts, or make meaningful decisions without emotion” (p. 18). She urged educators to explore with students the meaning and relevance of the information to be learned rather than aiming teaching efforts simply at the cognitive level. Nurses in this study who received the intervention emphasizing the affective domain commented that they were surprised at how much they learned, supporting this neurobiological premise. Future research is needed to explore the higher levels of behavior change in pressure ulcer prevention and ultimately organizational outcome improvement.

REFERENCES


