

Original Article

Examining the factors associated with nurses' professional identity from the perspectives of learning effectiveness and teamwork skills

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Purpose: The promotion and retention of care experience are crucial in nursing practice. Research shows that professional identity can improve the retention of nurses and enhance their care practices. Most studies of professional identity have focused on clinical nurses, and there is limited research into nursing students' professional identity. This study aimed to test a model wherein simulation learning effectiveness, teamwork skill, and competence are related to professional identity.

Methods: In this quantitative and correlational study, participants were 102 nursing students, who were recruited from one medical university in Taiwan. Data were collected using the Simulation Learning Effectiveness Scale, Teamwork Skills Scale, Holistic Nursing Competence Scale, and Professional Identification Scale.

Results: Simulation learning effectiveness and teamwork skill were significantly and positively associated with holistic nursing competence ($\beta = .44$; $\beta = .46$, $p < .001$). In addition, holistic nursing competence was significantly and positively associated with professional identity ($\beta = .55$, $p < .001$). Overall, simulation learning effectiveness and teamwork explained 50.8% of the variance in nursing competence. Nursing competence explained 30% of the variance in professional identity.

Conclusion: The findings of this study expand our understanding of nursing students' professional identity. This may be particularly useful for nursing school faculties to develop strategies to enhance students' professional identity.

Keywords: competence, self-efficacy, students, professional identity, teamwork

1. Introduction

Nurses' professional identity is defined as "the values and beliefs held by nurses that guide their thinking, actions and interactions with the patient").

[1] Clinical nurses with greater work experience who continue to work in healthcare facilities are valued.

Previous studies have shown that professional identity affects nurses' willingness to continue nursing practice. [2-3] Thus, continuously improving nurses' professional ability and identity are the common goals of nursing education and practice.

Studies have explored clinical nurses' professional identity that affects their retention, especially in the face of emerging diseases and diverse needs for care. [3] However, most studies have focused on the professional identity of clinical nurses rather than nursing students. [2-4] Developing nursing students' professional identity may have more benefits in their future nursing career. A better understanding

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of factors that affect nursing students' professional identity could help improve nursing education and thereby enhance their nursing ability and identity. Currently, many nursing schools are adopting simulated situational training to allow students to develop caring and teamwork skills. Therefore, this study aimed to assess a model in which simulation learning effectiveness, teamwork skills, and competence are related to professional identity.

Background

Professional identity and its antecedents

According to the social identity theory, individuals tend to classify themselves and others into various social categories, such as organizational membership, religious affiliation, and gender. Thus, social identity is defined as “the perception of oneness with or belongingness to some human aggregate”.^[5] Indeed, an individual's social identity may be derived from not only the organization they work for but also their work group. Thus, it may be worth focusing on nursing students' professional identity in the learning stage itself.

Öhlén and Segesten stated that the antecedents of professional identity refer to both personal and interpersonal dimensions.^[6] Personal dimensions include insight, capacity, self-care, and self-reflection abilities; interpersonal factors include shared experiences with other nurses in a narrative and reflective way. A study found that professional identity develops in relation to professional confidence and capability.^[7] According to De Araujo Sartorio and Pavone Zoboli,^[8] good nurses are talented, competent, and carry out their professional duties excellently. These studies suggest a relationship between professional competence and professional identity.

Clinical simulation learning and practice

Previous studies have shown that nursing education has a significant effect on the development of nursing students' professional values and identity.^[9-10] In addition, Hoeve, Jansen, and Roodbol proposed that professional identity and self-concept undergo changes as a result of nurses' interactions with colleagues, other healthcare professionals, and patients.^[11] It is evident that peer-to-peer interaction and improvement of nursing abilities influence

nurses' professional identity.

Development of nursing abilities should focus on maintaining care quality and ensuring patient safety. Moreover, real clinical settings are best suited to improving nursing students' learning experience. Teaching and learning nursing through simulation training can not only ensure patient safety but also bring classroom teaching closer to real clinical settings. Simulation-based learning provides students an opportunity to practice and reflect on their clinical care skills in a safe environment.^[12] Studies have shown that simulation practice improves students' confidence, knowledge, care skills, and reflective skills.^[13-14]

Furthermore, self-efficacy, which is defined as one's judgment of their own capabilities, promotes one's efforts to engage in certain behaviors.^[15] A previous study demonstrated that the greater the effectiveness of simulation learning, the better the self-reflection and insight of students.^[16] Furthermore, a recent study reported that self-efficacy is a predictor of caring behavior.^[17] These findings suggest that simulation-based learning could enhance nursing students' nursing care competence.

Thus, based on existing evidence, the present study examined the following hypotheses:

Hypothesis 1: simulation learning effectiveness positively predicts holistic nursing competence.

Hypothesis 2: Teamwork skills positively predict holistic nursing competence.

Hypothesis 3: Holistic nursing competence predicts professional identity.

2. Methods

2.1. Sample

This study was conducted using data from a longitudinal study of action research that began in August 2019. The study's fourth wave data were collected from nursing students at a medical university in Taiwan in February 2020. The fourth wave data were used in this model analysis, because students had just completed a fundamental nursing laboratory course and practiced real clinical care. This survey examined four variables: learning effectiveness, teamwork skills, holistic nursing competence, and professional identity. We invited 124

students to participate in this study, and 102 students completed the survey (response rate: 82.26%).

2.2. Measures

Simulation Learning Effectiveness Scale (SLES)

Students' self-learning effectiveness was measured using the 12-item SLES developed by Pai that comprises three subscales: self-motivation, self-regulation, and self-efficacy.^[18] Items are rated on a scale from 1 (strongly disagree) to 5 (strongly agree), with higher scores indicating greater learning efficiency.

Teamwork Skills Scale (TSS)

Teamwork skills were measured using the 17-item TSS developed by Blomstrom.^[19] Items were rated on a scale from 1 (poor) to 5 (excellent). Item scores were averaged to obtain a single scale score, with higher scores indicating greater teamwork skills.

Holistic Nursing Competence Scale (HNCS)

Holistic nursing competence was measured using the 27-item HNCS developed by Takase and Teraok,^[20] which comprises four subscales: general aptitude, ethically oriented practice, nursing care in a team, and professional development. Items are rated on a scale from 1 (not at all [competent]) to 7 (always [competent]), with higher scores indicating greater nursing care competence.

Professional identity

To measure participants' professional identity, two scales were used: Nursing Image—as a Profession Questionnaire (NIPQ) and Professional Commitment Scale (PCS). There are 22 items on the NIPQ^[21-22] and 34 on the PCS.^[23] All items on both scales are scored from 1 (strongly disagree) to 5 (strongly agree). For each scale, item scores were averaged to obtain a single scale score. Higher scores indicated greater professional identity.

2.3. Ethical considerations

The action research was approved by the Institutional Review Board at Chung Shan Medical University Hospital (approval number: CS2-19071).

2.4. Data analysis

SPSS 23.0 was used to analyze demographic and all other variables in the descriptive data. To further test the relationships among all variables, structural equation modeling (SEM) using partial least squares (PLS) with bootstrapping was performed using Smart/PLS software (v. 3.0).^[24]

3. Results

3.1. Participants

The study variables and the demographic characteristics of the participants are shown in Table

Table 1. Demographics of nursing students (N = 102)

Variable	n	%	Score range	M (SD)
Gender				
Male	17	16.7		
Female	85	83.3		
Age			20-23	20.56 (0.72)
Self-learning effectiveness			12-60	52.88 (6.70)
Teamwork Skills			17-85	71.21 (7.78)
Nursing competence			27-189	146.46 (23.19)
Professional identity				
Nursing image			22-110	87.63 (10.05)
Professional commitment			34-170	103.76 (17.97)

1. The age of the students ranged from 20 to 23 years (mean age: 20.56 years); 83.3% of the students were female. Students' scores on all measurements ranged from moderate to high, indicating that all students demonstrated sufficient learning effectiveness, teamwork skills, holistic nursing competence, and professional identity.

3.2. Testing the reliability and validity of the measurement model

We first performed a PLS analysis using Smart/PLS software (v. 3.0),^[24] to assess the extent to which the scale indicators reflected the following

constructs: learning effectiveness (three measure variables), teamwork skills (single measure variables), holistic nursing competence (four measure variables), and professional identity (two measure variables). As shown in Table 2, all factor loadings on the specified constructs were significant ($p < .001$), indicating that the measured variables were acceptable indicators for designated latent variables. Additionally, the composite reliability (CR) and Cronbach's alphas for all construct variables were above 0.94 and 0.89, respectively, confirming their adequate reliability.^[25-26]

The average variance extracted (AVE) for the all constructs was also greater than 0.79, indicating

Table 2. Factor loading, Cronbach's Alpha, CR, and AVE for the measurement variables (N = 102)

Construct measure	Loading	Cronbach's Alpha	CR	AVE
Learning effectiveness		0.93	0.96	0.88
Self-motivation	0.92***			
Self-regulation	0.94***			
Self-efficacy	0.95***			
Teamwork skill	1.00***	0.91	1.00	1.00
Holistic nursing competence		0.90	0.94	0.79
General aptitude	0.68***			
Ethically oriented practice	0.95***			
Nursing care in a team	0.94***			
Professional development	0.96***			
Professional identity		0.89	0.95	0.90
Nursing image	0.95***			
Professional commitment	0.95***			

Note. CR = composite reliability, AVE = average variance, *** = $p < .001$.

Table 3. Discriminant validity (N = 102)

Construct measure	1	2	3	5
1. Learning effectiveness	0.94			
2. teamwork skill	0.25	1.00		
3. Holistic nursing competence	0.56	0.57	0.89	
4. Professional identity	0.63	0.48	0.55	0.95

Note. Diagonal elements (bold) are the square root of the average variance extracted for each construct; off-diagonal elements are inter-construct correlations.

the convergent validity of the measurement model.^[26] We also computed the square root of the AVE to assess discretionary validity using Fornell-Larcker criterion.^[27] As shown in Table 3, the square root of each construct's AVE was greater than the correlation coefficients with other latent constructs. Thus, the discriminant validity of the measurement model is supported.^[27]

3.3. Hypotheses testing

After examining the measurement model's reliability and validity, we evaluated the hypothesized model using SEM with nonparametric bootstrap method that allows testing the significance of various PLS-SEM results such as path coefficients and R² values.^[24] As shown in Table 4, the hypothesized model had good data fit (SRMR = 0.047; NFI = 0.90). The model pathways, from learning effectiveness and teamwork skill to holistic nursing competence ($\beta = .44$; $t = 6.94$, $p < .001$; $\beta = .46$; $t = 6.09$, $p < .001$) and from holistic nursing competence to professional identity ($\beta = .55$; $t = 9.07$, $p < .001$), were significant. In other words, students' learning effectiveness and teamwork skills had significant, positive associations with nursing competence. Nursing competence had a significant, positive association with professional identity. These findings support all hypotheses. Additionally, learning effectiveness and teamwork explained 50.8% of the variance in nursing competence. Moreover, the R² of professional identity was 0.30, indicating the amount of variance in professional identity explained by nursing competence.

4. Discussion

This study aimed to examine the effect of learning effectiveness and teamwork skills on nursing

competence and to determine whether nursing competence affects professional identity in nursing students. First, we demonstrated how latent constructs can be identified by testing the measurement model and confirmed the reliability and validity of the measurement variables. Second, we empirically examined the relationships among all construct variables using SEM and found that the model had good data fit.

We found that the greater the learning effectiveness and teamwork skills, the greater the students' nursing competence. This suggests that participating in simulation practice and interacting with colleagues, through problem-based learning, can enhance students' clinical care ability. These findings echo previous findings that simulation practice improves students' confidence, knowledge, care skills, and reflective skills.^[13-14, 16] It also concurs with Bandura's (1986) argument that self-efficacy fosters individuals' efforts to engage in behaviors.^[15]

Further, students who demonstrated greater nursing competence reported higher professional identity. This result was expected, because personal capability and self-reflection ability are the antecedents of professional identity.^[6] This finding is consistent with that of MacLeod,^[7] who proposed that professional identities are developed in relation to professional confidence and capability. It is also in keeping with a previous finding that good nurses are competent and can carry out their professional duties excellently.^[8] Our finding suggests that early professional identity is more likely to improve students' simulation practice learning, emphasizing the need to promote teamwork learning, which enables nursing students to perceive themselves as part of a professional in-group. Moreover, considering that 30% of the variance in professional

Table 4. Direct effects from learning variables to outcome variables (N = 102)

Hypotheses/Path	Standardized path estimate	t	p
H1: Learning effectiveness → Holistic nursing competence	0.44	6.88	< .001
H2: Teamwork skill → Holistic nursing competence	0.46	6.45	< .001
H3: Holistic nursing competence → Professional identity	0.55	8.14	< .001

identity was explained by nursing competence, it can be suggested that nursing competence plays a crucial role in students' professional development.

5. Conclusion

In this study, we examined how learning effectiveness and teamwork skills can enhance nursing students' holistic nursing competence and shape their professional identity. From the perspective that schooling is the first step of socialization in a profession, nursing students' experience in school through clinical simulation practice can have a positive effect on their caregiving competence and professional identity. These findings expand our understanding of professional identity and may help nursing school faculties to develop strategies to enhance nursing students' professional identity.

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