International Journal of Nursing Studies 89 (2019) 18–23

Contents lists available at ScienceDirect

International Journal of Nursing Studies

journal homepage: www.elsevier.com/locate/ijns

The effect of gender role orientation on student nurses' caring behaviour and critical thinking

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ARTICLE INFO

Keywords:
Caring
Critical thinking
Student nurse
Gender role
Stereotype

ABSTRACT

Aim: We explored the impact of gender role orientation (masculinity and femininity) on student nurses' caring behaviour and critical thinking.

Background: Caring and critical thinking are at the core of professional nursing education. Previous studies revealed inconsistent findings regarding the impact of gender roles on caring behaviour and critical thinking.

Design and Methods: We employed a quantitative correlational study. Nursing students (N = 449; female = 310, male = 139) who had at least had one month of clinical practice experience were recruited from four universities in Taiwan. Students' ages ranged from 19 to 29 years (Mean age = 21.24 years, SD = 1.28). Data were collected from August 2016 to July 2017, using three questionnaires: Taiwan Critical Thinking Disposition Inventory (CTDI), Caring Assessment Report Evaluation Q-sort Scale (CARE-Q), and Bem Sex Role Inventory (BSRI). Partial least squares structural equation modelling and generalized linear models were conducted to test the research model and hypotheses.

Results: Findings indicated that students who reported higher caring and masculinity presented greater critical thinking (ß = .37 and ß = 0.24, respectively; $ps < .001$). Students' gender, age, femininity, or clinical practice experience, however, were not significantly associated with critical thinking (ß = -0.01, ß = 0.09, ß = .10, and ß = 0.01, respectively; $ps > .05$). In addition, students who reported higher masculinity and femininity presented greater caring behaviour (ß = .22 and ß = 0.38, respectively; $ps < .001$). Students' gender, age or clinical practice experience were not significantly associated with caring behaviour (ß = .04, ß = .03, and ß = -0.05, respectively; ps > 0.05). The findings confirmed a direct influence of caring and masculinity on critical thinking. Masculinity indirectly affected critical thinking via caring behaviour. Caring and masculinity accounted for 34.4% of the variance in critical thinking, and masculinity and femininity accounted for 29.1% of the variance in caring behaviour.

Conclusion: Our study confirms the effect of age, gender role, and caring behaviour on critical thinking. We recommend that the cultivation of nursing care behaviour focus on students' gender role orientation. In addition, clinical nurse educators, when working with male students on patient caring, should consider their gender role orientation and support male nursing students' ways of presenting caring behaviours.

What is already known about the topic?

- Students' presentation of caring behaviour affects their critical thinking.
- Gender has no significant effect on students' perceptions of caring behaviours and critical-thinking dispositions.
- Male nurses face gender role strain in the current nursing environment because there is a myth that female nurses are more caring, as it is a feminine trait, whereas male nurses' masculinity is not considered to be related to caring.

What this paper adds

- There are no sex differences in the presentation of caring behaviour, critical thinking, masculinity, or femininity.
- Nursing students who reported higher femininity presented greater

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https://doi.org/10.1016/j.ijnurstu.2018.09.005
Received 3 April 2018; Received in revised form 1 September 2018; Accepted 5 September 2018

caring behaviour than did their less feminine counterparts but did not show better critical thinking. Students' femininity was only indirectly associated with their critical thinking through their caring behaviour.
- Nursing students who reported higher masculinity presented greater caring behaviour and critical thinking as compared to their less masculine counterparts.
- Sex itself is not a chief predictor of caring behaviour or critical thinking; rather, the key variable is students' gender role.

1. Introduction

Caring and critical thinking are at the core of professional nursing education. Caring behaviour is a subjective experience and involves a physiologic response in patients (Morse et al., 2013), which also affects students' critical thinking (Chen et al., 2018; Pai et al., 2013). Nursing, however, is a female-oriented profession. Recently, the number of male nurses has been increasing, but many face gender role strain in the current nursing environment (Keogh and Gleeson, 2006). There is a myth that female nurses are more caring and have more feminine traits, whereas male nurses have more masculine traits (Abrahamsen, 2004). These beliefs, however, could mislead educators. Understanding gender roles in nursing can help nursing educators to have more effective teaching methods with students.

Previous research indicates that gender has no significant effect on students' perceptions of caring behaviours (Khademian and Vizeshfar, 2008). Early research, however, showed a significant correlation between the level of caring and gender traits in nurses (Laurella, 1997). In addition, Ghadi et al. (2012) indicated that there was no significant difference between male and female students in critical-thinking dispositions. The inconsistencies in previous research highlight the need for additional research to clarify the relationships between gender role traits, caring behaviour, and critical thinking.

More recently, Adams (2016) noted that the provision of caring behaviours, which we identify as at the core of nursing, faces challenges due to changes in the medical environment, political climate, and the complexities of patient care. In this regard, nursing professionals and theorists of caring behaviour provide various insights into the core of nursing behaviour, from which the definition of caring behaviour can be clarified or redefined. We expect that the findings of this study of the relationships between gender role, caring behaviour, and critical thinking can contribute to future revisions or clarification of the definition of caring.

1.1. Gender role orientation and nursing

Bem (1974) stated that sex-typed roles dictate society's standards of desirable behaviour for men and women. This conception, however, might inhibit the behaviours of individuals who are stereotyped as masculine or feminine. Bem noted, 'Masculinity has been associated with an instrumental orientation, a cognitive focus on getting the job done; and femininity has been associated with an expressive orientation, an affective concern for the welfare of others' (p. 156). She further indicated, however, that individuals also can be 'androgynous'. In other words, they might be both masculine and feminine and employ either an instrumental or expressive orientation, based on the situation. Further, masculine and feminine roles are reciprocal and can be changed, depending on the setting (Connell, 2005). Finally, gender is socially constructed, and gender expectations vary between cultures and can change over time (World Health Organization, 2015).

Previous studies have shown that male students report less masculinity than female students report femininity. This may be because many modern Taiwanese young men are expressing feminine traits, while women remain feminine (Lue et al., 2013). Al-Zein and Al-Khawaldeh (2015) explored gender-role characteristics, using the Bem Sex-Role Inventory, among male Jordanian nursing students and found that 43.44% of students were masculine and 45.08% were androgynous. This shows that gender role traits are not limited to sex differences and that men and women may have the same gender trait preferences. In Chinese culture, female nurses are more accepted by patients and their families because women are considered the chief caregivers (Liu, 2010). Liu conducted a qualitative study to explore nurses' perceptions of their work role based on Chinese gender roles and found the need to provide a more gender-sensitive, positive work environment for nurses.

1.2. Caring behaviour and critical thinking

Ennis (1962) defined critical thinking as 'the correct assessing of statements' (p. 81), while Paul et al. (1990) defined it as the process of conceptualizing, applying, analysing, synthesizing, or evaluating information from observation, experience, self-reflection, reasoning, or communication. Critical thinking is related to caring behaviour, which stems from having special affection or concern for the recipient of care (Leira, 1994). Morse et al. (2013) examined caring and identified two dimensions: a subjective experience and a physiological response. Thayer-Bacon (1993) emphasized that, without caring, a person cannot be a good critical thinker.

Benner and Wrubel (1989) and Ben-Sira (1990) demonstrated that caring actions are vital for nurses in providing care to patients because they help nurses to understand their own thinking and attitudes. Zimmerman and Phillips (2000) noted that taking a caring perspective can stimulate critical-thinking ability in nursing students. Clearly, there is a relationship between care and critical thinking. Previous studies indicated that there is a positive relationship between caring behaviour and critical-thinking disposition (Arli et al., 2017; Pai et al., 2013), and further research showed that critical thinking also could be predicted by caring behaviour (Chen et al., 2018; Pai et al., 2013).

1.3. The relationship among caring, critical thinking, age, and gender roles

A previous study found that nurses who were older, had worked longer, and had a higher education level and a more prestigious position/title had greater critical-thinking ability than did their counterparts (Chang et al., 2011). Hunter et al. (2014), however, found that age and sex did not predict students' critical-thinking skills. Ghadi et al. (2012) examined critical thinking among male and female undergraduate students in Malaysia and found that there was no significant sex difference. Salahshoor and Rafiee (2016) investigated the relationship between critical thinking and sex among Iranian English-as-a-foreign-language learners and also found that men and women did not significantly differ in their application of critical-thinking skills.

Nurses' age, sex, and experience influence the quality of care that they provide (Crossan and Mathew, 2013; Routasalo, 1999). Previous studies show that older nurses reported higher perceptions of their own caring behaviour than did younger ones (Khademian and Vizeshfar, 2008; Li et al., 2016). Among Chinese clinical care nurses, attitude and behaviour were positively associated with age and seniority (Jiang et al., 2015). Nevertheless, Labrague et al. (2017) found that there were no significant correlations between caring behaviour, educational level, and family structure of student nurses, except for age ($p = .002$, η^2 : eta-squared = 0.141). In addition, sex had no significant effect on students' perceptions of their own caring behaviours (Khademian and Vizeshfar, 2008). These findings are in contrast with earlier research, showing that there was a significant correlation between caring and gender traits in nurses (Laurella, 1997).

In sum, the literature presented above led us to develop the following hypotheses:

Hypothesis 1. Caring behaviour will be positively associated with critical thinking.

Hypothesis 2. Gender (male as a reference) will be positively

associated with caring behaviour and critical thinking.

Hypothesis 3. Age will be positively associated with caring behaviour and critical thinking.

Hypothesis 4. Masculinity will be positively associated with caring behaviour and critical thinking.

Hypothesis 5. Femininity will be positively associated with caring behaviour and critical thinking.

Hypothesis 6. Clinical practice experience will be positively associated with caring behaviour and critical thinking.

2. Methods

2.1. Study design and procedure

This quantitative correlational study was approved by the Institutional Review Board of Chung-Shan Medical University Hospital (No: CS2-16079). Initially, we obtained the administrative assistance of the school nursing department through an e-mail request. Then, the investigator described the purpose of the research to the students in each classroom. Students completed the questionnaire anonymously after their informed consent was obtained. A convenience sample of 460 nursing students was recruited from four universities in Taiwan. All participants had more than one month of clinical experience. Data were collected from August 2016 to July 2017. A power analysis for *t*-tests (the difference between independent means for the two groups) was calculated using G*power. The four input parameters were two-tailed, $\alpha = 0.05$, effect size (f^2) = 0.5, and power = 0.80. A sample size of 64 was required for each group. In addition, for the generalized linear model (GLM), we again used four input parameters (two-tailed, $\alpha = 0.05$, effect size (f^2) = 0.15, and power = 0.80). A sample size of 343 was needed. For the partial least squares structural equation modelling (PLS-SEM) analysis, we calculated the sample size based on the rules of degrees of freedom (df) = p(p + 1)/2-q (MacCallum et al., 1996), in which p is the number of observed variances to be estimated, and q is the number of free parameters to be estimated. In this study, 12 observed variances and 35 free parameters were estimated (12 factor loadings, 12 for errors, and 11 for the correlations among the latent factors). This yields 43 degrees of freedom to achieve a power value of 0.80, for which a sample size of 294 was needed (MacCallum et al., 1996). Therefore, our sample size of 449 (response rate = 97.61%) was sufficient.

2.2. Measures

Three instruments were used, including the Taiwan Critical Thinking Disposition Inventory (TCTDI), Caring Assessment Report Evaluation Q-sort Scale (CARE-Q), and Bem Sex Role Inventory (BSRI). The content validity of these scales was examined by three nursing professors, and all content validity indices (CVIs) exceeded 0.89.

2.2.1. Taiwan Critical Thinking Disposition Inventory (TCTDI)

Critical thinking was measured using 20 questions from the TCTDI (Yeh, 1998, 1999). This scale has four dimensions: systematicity/analyticity (9 items), open-mindedness (4 items), inquisitiveness (3 items), and reflective thinking (4 items). Each question is answered using a 6-point Likert-type scale (1 = never to 6 = always), and higher scores indicate higher critical-thinking intention and skill. The subscale score ranges are 9–54, 4–24, 3–18, and 4–24, respectively. A previous study noted that the Cronbach's *α*s of the dimensions ranged from 0.83 to 0.92 (Yeh, 1999). Recent research indicated that the composite reliability of the scale was 0.97 (Chen et al., 2018).

2.2.2. Caring Assessment Report Evaluation Q-sort Scale (CARE-Q)

Caring behaviour was measured using 40 questions from the CARE-Q (Chen et al., 2012). The scale has three dimensions: sense of security (16 items), comfort (16 items), and accessibility (8 items). Each question is answered using a 5-point Likert-type scale (1 = strongly disagree to 5 = strongly agree), and higher scores indicate more caring behaviour. The subscale score ranges are 16–80, 16–80, and 8–40, respectively. A previous study noted that the Cronbach's *α*s of the dimensions ranged from 0.91 to 0.93 (Chen et al., 2012), and the composite reliability of scale was 0.97 (Chen et al., 2018).

2.2.3. Bem Sex Role Inventory (BSRI)

Sex role orientation was measured using 16 items from the BSRI (Wang et al., 1997). The scale has two dimensions: masculine instrumentality (8 items) and feminine expressiveness (8 items). Each question is answered using a 7-point Likert-type scale (1 = strongly disagree to 7 = strongly agree), and higher scores indicate a greater sex role orientation.

The subscale scores range from 8 to 56. A previous study noted that the Cronbach's *α*s of the dimensions were > 0.77 (Wang et al., 1997; Wang and Wang, 2007).

2.3. Data analyses

First, descriptive statistics were conducted to examine data distributions. The results from a series of bivariate tests (independent *t*-tests) were used to determine reported caring behaviour, critical-thinking intention and skills, and gender role orientation per sex. Second, we tested the relationship among all variables through the PLS-SEM analysis. Finally, a GLM was conducted to examine the interaction effects of age and femininity on critical thinking. In this study, descriptive statistics and GLM analyses were conducted using SPSS version 20.0 (SPSS Inc., Chicago, IL, USA). PLS-SEM with bootstrapping was conducted, using Smart PLS version 3.2.7 (Ringle et al., 2015) to test the hypotheses. Two-tailed *p*-values < .05 were considered significant. A standardized root mean residue (SRMR) value of less than 0.05 and a normed fit index (NFI) value above 0.90 would indicate acceptable goodness of fit of the model (Henseler et al., 2014; Henseler et al., 2016).

3. Results

3.1. Participants' characteristics

Participants' ages ranged from 19 to 29 years (M = 21.24 years, SD = 1.28). More than half of the sample (69%) were female. Most participants (85.2%) had religious beliefs, and most (84.2%) perceived their family, in terms of income, as well off. All participants had at least 144 h of practicum experience in foundational nursing. Students' clinical practice experience ranged from 144 to 1,456 h (M = 162.04 h). Approximately half of the participants reported having other practicum experience (e.g., medical-surgical, paediatric, obstetrics) (Table 1).

For comparisons between men and women, *t*-tests for key variables were used. As shown in Table 2, there were no sex differences for age, clinical practice experience, caring behaviour, critical-thinking skills, or gender role orientation.

3.2. Association among research variables and model testing

Table 3 shows the validity, reliability, R-squared (R^2), and correlations between variables. The composite reliability (CR) and average variance extracted (AVE) for caring behaviour and critical thinking were greater than 0.90 and 0.80, respectively, which are acceptable values per Hair et al.'s (2014) guidelines of 0.70 and 0.5, respectively. The Cronbach's *α*s for all variables were above 0.80, which also satisfies the criterion for reliability (> 0.70; Cronbach, 1951). To examine

Table 1
Participant characteristics (N = 449).

Variable	Mean	SD	*n*	%
Age	21.24	1.28		
Clinical practice experience (hours)	612.04	494.67		
Gender				
Female			310	69
Male			139	31
Grade				
2			91	20.3
3			154	34.3
4			204	45.4
Religious belief				
Yes			378	85.2
No			71	15.8
Clinical practical experience (multiple choice)				
Fundamentals of nursing			449	100
Medical-surgical nursing			243	54.1
Pediatric nursing			241	53.7
Obstetrics nursing			207	46.1
Psychiatric mental health nursing			200	44.5
Community nursing			200	44.5
Nursing administration			145	32.3
Last-mile program			192	42.8
Family income status				
Wealthy/rich			3	0.7
Well off			378	84.2
Low income			54	12.0
Unknown			14	3.1

Table 2
Descriptive statistics (N = 449).

	Females (n = 310)		Males (n = 139)			
Variable	Mean	SD	Mean	SD	*t*	*p*
Age	21.17	1.25	21.40	1.32	1.807	.078
Clinical practice experience (hours)	587.67	504.33	666.42	469.64	1.562	.119
Critical thinking	93.45	13.30	94.96	12.97	−1.123	.262
Systematicity	41.65	6.23	42.52	6.08	−1.368	.172
Open-mindedness	19.44	2.66	19.48	2.72	−0.158	.874
Inquisitiveness	13.82	2.28	14.11	2.30	−1.222	.222
Reflective thinking	18.54	2.93	18.86	2.74	−1.092	.275
Caring behaviour	160.84	16.48	163.42	17.98	−1.439	.151
Sense of security	65.32	6.73	66.45	7.32	−1.624	.105
Comfort	62.92	7.27	63.99	7.48	−1.428	.154
Accessibility	32.62	3.80	32.98	4.12	−.901	.368
Gender role						
Masculinity	43.07	7.35	44.25	6.99	−1.601	.110
Femininity	38.34	5.89	38.65	5.56	−0.517	.606

discriminant validity, we calculated the square root of the AVE for both caring behaviour and critical thinking. The results of the two values were greater than their highest correlation with any other construct (Table 3), which satisfies the criterion posited by Fornell and Larcker (1981). Other variables, such as age, gender, and clinical experience, were a single, observed indictor, and, thus, their CR, AVE, Cronbach's αs, and discriminant validity were 1.00 (Ringle et al., 2015). In addition, critical thinking was significantly and positively associated with caring (r = 0.52, p < .01), masculinity (r = 0.45, p < .01), and femininity (r = 0.40, p < .01). A higher level of masculinity and femininity were linked to higher reporting of caring behaviour (r = 0.43, p < .01). A positive association was found between masculinity and femininity (r = 0.55, f < 0.01). In addition, age was significantly and positively associated only with clinical practice experience (r = 0.51, p < .01). Clinical practice experience was significantly and positively associated with age only, and the correlation with other variables was not significant.

The results in Fig. 1 reveal that caring and masculinity were significantly positively associated with critical thinking (ß = .37 and ß = .24, respectively; ps < .001), and gender, age, femininity, and clinical practice experience were not significantly associated with critical thinking (ß = -0.01, ß = 0.09, ß = .10, and ß = 0.01, respectively; ps > .05). In addition, masculinity and femininity were significantly positively associated with caring behaviour (ß = .22 and ß = .38, respectively; ps < .001); however, gender, age, and clinical experience were not significantly associated with caring behaviour (ß = .04, ß = .03, and ß = -0.05, respectively; ps > 0.05). Therefore, H1 and H4 were supported, and H2, H3, and H6 were not supported. Regarding H5, only femininity was positively associated with caring behaviour; therefore, H5 was partially supported. These findings indicate a direct influence of caring and masculinity on critical thinking. In addition, masculinity indirectly affected critical thinking via caring behaviour. Finally, among all key predictors, caring and masculinity accounted for 34.4% of the variance in critical thinking, and masculinity and femininity accounted for 29.1% of the variance in caring behaviour. In this model, the SRMR value was 0.028, which is less than 0.05, and the NFI value was 0.934, which is above 0.90. Therefore, this model is considered acceptable (Henseler et al., 2014, 2016).

3.3. Testing the interaction effects of age and femininity on critical thinking

We also conducted a GLM analysis to test whether there were interaction effects between age and femininity on critical thinking. Table 4 reveals that, when the effects of the interaction term for female x age was accounted for, the interaction term was significantly associated with critical thinking (ß = 0.009, p < .05).

4. Discussion

In this study, we compare differences in age, clinical practice experience, caring behaviour, critical thinking, masculinity, and

Table 3
Validity, reliability, R^2, and correlations of variables (N = 449).

Variable	AVE	CR	R^2	α	Correlation					
					1	2	3	4	5	6
1. Age	1.00	1.00	–	1.00	1.00					
2. Caring behaviour	0.87	0.95	0.291	0.92	.01	**.93**				
3. Critical thinking	0.86	0.96	0.344	0.95	.05	.52**	**.93**			
4. Masculinity	1.00	1.00	–	0.86	-.05	.43**	.45**	1.00		
5. Femininity	1.00	1.00	–	0.85	−.01	.50**	.40**	.55**	1.00	
6. Clinical experience	1.00	1.00	–	1.00	.51**	.02	.01	.00	.01	1.00

Note: α = Cronbach's alpha; Diagonal elements in the correlation column are the square root of the average variance extracted for each latent variable.
** p < .01.

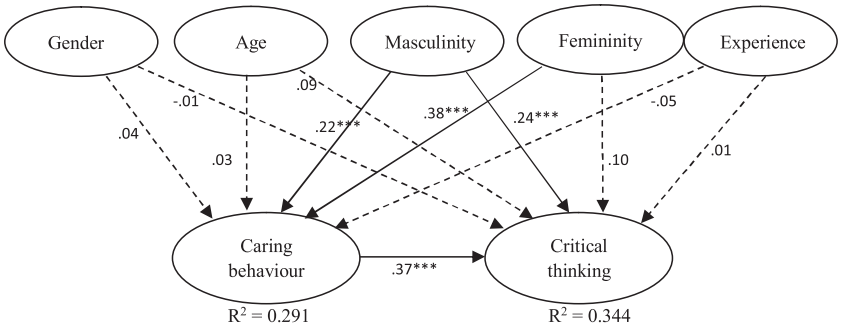

Fig. 1. Model of the effect of gender (male as a reference), age, gender role (Masculinity and Femininity), clinical practice experience, and caring on critical thinking; *** p < .001.

Table 4
Estimated relationships between critical thinking and key research variables (N = 449).

Variable	β	95% CI	*p*
(Intercept)	19.776	9.988–29.563	.000
Caring behavioukrs	.292	.224–.361	.000
Masculinity	.444	.280–.607	.000
Age x Femininity	.009	.000–.018	.046

Note: CI = Confidence Interval.

femininity between male and female student nurses. Critical thinking was an outcome variable, and age, clinical practice experience, gender role orientation (masculinity and femininity), and caring behaviour were predictor variables.

We found no sex differences in caring behaviour, critical thinking, masculinity, or femininity. This is consistent with previous research that indicated that sex did not predict students' critical skills (Ghadi et al., 2012; Hunter et al., 2014; Salahshoor and Rafiee, 2016). Our results also are in keeping with those of Khademian and Vizeshfar (2008) and Laurella (1997), who noted that sex had no significant effect on students' perceptions of caring behaviours. It is noteworthy, however, that our research sample showed no significant sex differences in masculinity and femininity. This finding echoes earlier research that indicated that androgynous nurses scored higher on measures of caring behaviour than did those who were deemed either masculine or feminine (Laurella, 1997).

As shown in Fig. 1, the SEM analysis results revealed that students' caring behaviour and masculinity were associated with their critical thinking. Moreover, students' femininity was indirectly associated with their critical thinking through their caring behaviour. There was, however, no significant correlation between gender, clinical practice experience, age, and caring behaviour or critical thinking. This model excluded the effects of gender and clinical practice experience on caring behaviour or critical thinking. These findings were consistent with previous research that found that students' age was not associated with critical-thinking skills (Hunter et al., 2014). In addition, our findings were inconsistent with those of previous studies that revealed that older students reported higher perceptions of caring behaviour than did their younger counterparts (Khademian and Vizeshfar, 2008; Labrague et al., 2017; Li et al., 2016). These inconsistent findings may be related to age-range discrepancies. Although students' age and femininity did not correlate with critical thinking, as shown in Table 4, the interaction effect of age and femininity on critical thinking was positive and significant. This indicates that older students with feminine traits present elevated critical-thinking skills.

In this study, students' femininity was positively associated with caring behaviour. There was no significant correlation, however, between femininity and critical thinking. This is consistent with the belief that women are more caring than are men. Our research shows, however, that, among both sexes, those who reported higher masculinity presented greater caring behaviour and critical thinking than did their less masculine counterparts. Our research stands in contrast to previous findings that sex had no significant effect on students' perceptions of caring behaviours (Khademian and Vizeshfar, 2008).

In sum, we found that caring behaviour, masculinity, and the interaction between female x age can positively predict critical thinking. Therefore, we posit that sex itself is not a chief predictor of caring behaviour and critical thinking; rather, the key variable is students' gender role. As such, the cultivation of both masculinity and femininity among nursing professionals is vital. In addition, because caring behaviour was positively associated with critical thinking, which is consistent with past research (Arli et al., 2017; Chen et al., 2018; Pai et al., 2013), caring behaviour should be emphasized to cultivate students' critical-thinking abilities. As Thayer-Bacon (1993) noted, without caring, an individual cannot be a good critical thinker.

5. Limitations

There are two limitations to this study. First, this study is limited by its cross-sectional design, which hinders the ability to infer causation. Thus, future studies should utilize a longitudinal design. Second, the study used convenience sampling, which perhaps limits the generalizability of the results to other populations of nursing professionals; thus, replication in future research is warranted. We did, however, survey students who had at least one month of clinical practice experience, who were recruited from four universities in North, Central, and Southern Taiwan. In addition, we employed two advanced statistical methods (SEM and GLM) to confirm the data analyses results. Therefore, the findings of this study can be considered valuable and contribute to knowledge about nursing professionals that can be used to address gender stereotypes.

6. Conclusion and implications in practice

Our research confirms that caring can stimulate critical-thinking ability in nursing students and that critical thinking can be predicted by caring behaviour, which is consistent with previous research (Chen et al., 2018; Pai et al., 2013; Zimmerman and Phillips, 2000). Importantly, our research model elucidates the relationship between age, gender role, caring, and critical thinking. The findings can be used to implement strategies to promote nursing students' critical thinking. Specifically, the cultivation of nursing care behaviour should include attention to students' gender role orientation. In addition, the stereotypes associated with male nurses should be examined. Further research also should examine other related factors that may influence critical-thinking ability as a means to improve the model. We also recommend that clinical nurse educators, when working with male students in regard to patient care, should consider individual gender role orientation and support male nursing students' ways of showing caring behaviours.

Ethical approval

The study design and procedures were approved by the institutional review board of Chung-Shan Medical University Hospital (No: CS2-16079). Written informed consent was obtained from all participants.

Funding

This research was funded by the Chung-Shan Medical University, Taiwan (105-CSMU-GE-001).

Acknowledgements

We thank Professors Yu-Chu Yeh, Wen-Jiuan Yen, and Ching-Fu Wang who provided the scales for this study. We also thank all the participants. In addition, we thank Chung-Shan Medical University for funding this study (105-CSMU-GE-001).

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