Critical Thinking Skills of RNs: Exploring Demographic Determinants

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Critical thinking has been defined in various ways in the literature. Robert and Petersen (2013) defined critical thinking as comprising logical reasoning, strategic cognition, and decisiveness that is vital in various types of decision making. Despite the various definitions of critical thinking, there is an underlying consensus that critical thinking is purposeful thinking that involves reflective reasoning prior to deriving a conclusion, which leads to a clinical decision (Lee, Abdullah, Subramanian, Bachmann, & Ong, 2017).

The health care domain has become more complex and challenging following the rapid growth in information technology, shrinking resources, and cost constraints (Hooper, 2014). For nurses to function effectively in today’s health care environment, they must cultivate stronger critical thinking skills that will enable them to filter and synthesize information competently and become experts in solving individualized and contextual specific problems (Azizi-Fini, Hajibagheri, & Adib-Hajbaghery, 2015). In fact, critical thinking skills have a significant positive relationship with nursing competence and are perhaps the most distinguishing attribute of an expert nurse (Chang, Chang, Kuo, Yang, & Chou, 2011). In view of this, cur-

abstract

Background: Previous studies of nurses’ critical thinking skills that included demographic characteristics as determinants have been inconclusive. This study explored demographic determinants of critical thinking skills among nurses from public hospitals in Peninsular Malaysia.

Method: This cross-sectional study included 549 nurses recruited via multistage cluster sampling. Nurses completed the demographic questionnaire and Health Sciences Reasoning Test (HSRT).

Results: The majority of respondents failed to demonstrate critical thinking skills with a mean overall HSRT score of 13.8 (SD = 3.4). Educational qualifications (p = .003) and clinical specialties (p = .022) were significantly related to nurses’ critical thinking skills. Years of clinical experience, age, and job ranking were not significant.

Conclusion: The findings indicate a need to address the present curriculum in nursing education and to reinforce critical thinking skills in the nursing workforce. Future research on how nurses in Malaysia acquire critical thinking skills is needed. [J Contin Educ Nurs. 2020;51(3):109-117.]

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riculum transformation of nursing education worldwide has placed greater emphasis on critical thinking as a desirable education outcome (Boso & Gross, 2015; Drennan, 2010).

In Malaysia, reforms of nursing education began in the early 1990s with the conversion of certificate to diploma level courses. Further degree and postgraduate nursing programs were designed with the goal of developing more knowledgeable nurses able to think critically and make effective clinical decisions (Ministry of Education, 2010). However, this strategy has yet to achieve its goal. It seems that basic nursing education in Malaysia has not equipped nurses with the required level of critical thinking skills to deal with the increasingly complex challenges in health care (Abdullah, Alzaidiyen, & Yee, 2010). Although this has been a concern to stakeholders, nurses’ critical thinking skills have not been researched in depth in diverse clinical contexts in Malaysia.

LITERATURE REVIEW

There are ongoing studies that investigate factors, such as nurses’ demographic characteristics, influencing nurses’ critical thinking skills. However, the results are still inconclusive. Hypothetically, pursuing higher educational qualifications should result in a higher level of critical thinking skills among nurses, but this assumption is still debatable (Drennan, 2010).

In Taiwan, two studies were conducted on clinical nurses’ critical thinking skills using the same translated Watson-Glaser Critical Thinking tool. One study by Chang et al. (2011) found educational qualification (p < .001) and clinical experience (p < .001) were significantly associated with critical thinking skills. However, the second study by Feng, Chen, Chen, and Pai (2010) found only clinical experience (p < .05) positively affected nurses’ critical thinking, whereas educational qualifications were not significant (p > .05). In the United States, a study using the Health Sciences Reasoning Test (HSRT) found neither educational qualifications nor clinical experience significantly affected nurses’ critical thinking skills (Lang, Beach, Patrician, & Martin, 2013). Using the same HSRT tool, Maneval et al. (2012) found educational qualification was not a significant predictor for nurses’ critical thinking skills (p > .05). In another study, Hooper (2014) did not find any significant associations between nurses’ HSRT score and clinical experience (p = .227); however, educational qualifications were not included as a variable.

In Malaysia, only one study was found that explored critical care nurses’ critical thinking. The results showed that besides education level and working experience, nurses’ age, gender, and ethnicity significantly impacted critical thinking (p < .05) (Ludin, 2018). However, the tool used in the study was a Malay- and English-translated Short Form Critical Thinking Disposition Inventory-Chinese Version. Thus, the study focused on nurses’ critical thinking disposition rather than their level of critical thinking skills.

The literature has yet to identify which demographic factor—higher educational qualification or more clinical experience—has a greater influence on developing critical thinking skills among nurses. Besides educational qualifications and years of clinical experience, demographic factors commonly evaluated for their association with nurses’ critical thinking skills were age (Azizi-Fini et al., 2015; Chang et al., 2011; Drennan, 2010; Feng et al., 2010; Hooper, 2014; Lang et al., 2013; Maneval et al., 2012), gender (Azizi-Fini et al., 2015), job ranking (Chang et al., 2011; Feng et al., 2010), and clinical specialty (Chang et al., 2011; Hooper, 2014; Lang et al., 2013). However, most of these studies did not analyze all of the demographic factors collectively. The main concern with these studies is that some of these demographic factors may serve as confounding variables, thus increasing the probability of reporting false analysis and interpretation of results. Therefore, it is imperative to include all of the demographic factors that were found to be relevant in the current study to gain a comprehensive understanding of contributing factors for nurses’ critical thinking skills.

In the literature, common instruments used included the Watson-Glaser Critical Thinking Appraisal (WGCTA) (Watson & Glaser, 1980), the California Critical Thinking Skills Test (CCTST) (Facione, 1992), the California Critical Thinking Disposition Inventory (CCTDI) (Facione & Facione, 1992), and the HSRT (Facione, Facione, & Winterhalter, 2010). The HSRT was the only tool developed for measuring critical thinking of health sciences students and professionals and thus was suitable for nurses.

This study aimed to assess the level of critical thinking skills among RNs in Malaysia and to obtain scores in inductive and deductive reasoning, interpretation, analysis, and evaluation skills with the HSRT. Most importantly, the study aimed to explore the related demographic characteristics of nurses’ critical thinking skills, specifically to determine whether educational qualifications or clinical experience have a significant impact on nurses’ critical thinking skills.

METHOD

Study Design

A cross-sectional correlational design was used for this study. According to Johnson (2010) and Polit and Beck (2017), a cross-sectional design involves collection of data at one point in time, and the focus is to find the relationships among the variables under study. According to
Leedy and Ormrod (2010), correlational research is about establishing relationships between two or more variables in the same population rather than to infer cause-and-effect relationships. Because the current study sought to measure nurses’ critical thinking skills at a specific point in time and to explore the relationships between nurses’ critical thinking and demographic variables, without intending to establish a cause-and-effect relationship, a cross-sectional correlational design was chosen for this study.

Sample
At the time of the study, a total of 64,016 RNs worked in 134 public hospitals in Malaysia; 92 hospitals were located in Peninsular Malaysia and 42 hospitals were located in Sabah and Sarawak (Ministry of Health, 2015). The hospitals in Sabah and Sarawak differed substantially from those in Peninsular Malaysia due to the widespread population and the availability of more community health facilities (United Nations Country Team, 2011). To ensure the uniformity and homogeneity of the hospitals selected for the study, only the public hospitals in Peninsular Malaysia were included. Data were analyzed using STATA® version 14.0 statistical software; a p value less than .05 and power at .8 was considered significant. The minimum sample size calculated was 500. However, with an anticipation of a 70% response rate and incomplete returns, a final size of 800 was considered suitable for this study. Nurses were selected via multistage cluster sampling that developed the same level of critical thinking as nurses with more experience. Nurses in administrative and management positions who were not involved in direct patient care also were excluded. Finally, nurses who were on maternity leave, long study leave, or long medical leave also were excluded as they were not available for data collection.

Ethical Consideration
Approval for the study was obtained from the National Medical Research Register (NMRR), Malaysia (NMRR-14-1436-21541 IIR). Permission to conduct the study among the nurses from the selected hospitals was obtained from the respective hospital directors and nursing directors. A participant information sheet and informed consent form approved by NMRR were given to participants in both Malay and English language because all nurses in Malaysia are bilingual. The information sheet and consent form provided detailed information on the purpose of the research study, noted that participation was voluntary, and also assured confidentiality and anonymity of information gathered. The questionnaires were distributed and collected via sealed envelopes, and participants were reassured as stated in the participants’ information sheet that scores would be coded to preserve anonymity and their identity would not be revealed.

Instruments
Demographic Questionnaire. The research questionnaire included six demographic questions on job ranking, clinical specialty, nursing educational qualification, gender, age, and years of clinical experience.

HSRT. The HSRT is a commercially available tool developed by Facione et al. (2010). The HSRT includes 33 multiple-choice questions; respondents are required to read the vignettes and then respond according to the choices provided. The vignettes offer the required content without presuming any specialized knowledge and are structured with no cultural bias (Lang et al., 2013). The HSRT measures five domains of critical thinking skills: inductive reasoning, deductive reasoning, inferential reasoning, analytical ability, and evaluation (Facione et al., 2010). The guidelines for interpreting the overall scores of HSRT and the five domains are presented in Table 1.

The HSRT was chosen because at the time of the study, it was the most suitable single tool used to assess critical thinking of nurses. The HSRT is an established tool that has been used extensively to measure critical thinking skills in nursing (Cazzell & Anderson, 2016; Goodstone et al., 2013; Hunter, Pitt, Croce, & Roche, 2014; Lang et al., 2013; Maneval et al., 2012). Although other standardized instruments were available, they either were not specifically designed for health care professionals (Lee et al., 2017) or were fairly new tools without established reliability and validity (Carter, Creedy, & Sidebotham, 2015). The HSRT has an overall internal consistency value of 0.81 with the Kuder–Richardson Formula 20 and an overall reliability coefficient of 0.81 (Facione et al., 2010). In addition, construct validity was confirmed independently by Huhn, Black, Jensen, and Deutsch (2011), who were able to discriminate between health care experts and novices (p = .008).

Translation of Research Instrument. The HSRT was translated from English to Malay language according to standard forward-backward procedure proposed by Guil-
lemin, Bombardier, and Beaton (1993). Reworking of the HSRT to Malay language was done separately by two professional bilingual translators. The items then were translated back into English by two separate professional bilingual translators. Following a meticulous cultural adaptation, the final draft version was established. Both the backward-translated English version and the Malay version were sent to Insight Assessment Company for confirmation. After a few adjustments and clarifications on some of the terminology, the Malay language version of the HSRT was approved by the developers and is now available commercially.

Pilot Study. The questionnaire was pilot tested with 40 RNs from two randomly selected hospitals to assess face validity and to determine the length of time needed for participants to complete the questionnaire. Feedback received from the majority of the nurses was that the questionnaire should be bilingual, in both Malay and English language. Therefore, it was decided to use a bilingual questionnaire in the actual study. For the pilot study, the time allowed for participants to complete the test was 45 minutes. However, this was extended to a maximum of 90 minutes for the main study based on the feedback from the pilot study participants who reported 45 minutes was insufficient to complete the questionnaire.

Data Collection
After approval was granted by the respective hospital and nursing directors to conduct the study in the nine selected hospitals, the researcher met the nursing directors and ward nurse managers to explain the details of the research. All questionnaires were distributed and collected via sealed envelopes. Questionnaires were distributed by ward nurse managers to those nurses who fulfilled the inclusion criteria and were willing to participate in the study. The completed questionnaires were personally collected from the ward nurse managers within 2 to 3 weeks.

Data Analysis
Data were analyzed using IBM® SPSS® version 20.0 statistical software. Qualitative variables were described as frequencies and percentages, and quantitative variables were described as mean and standard deviation. In testing the factors associated with critical thinking skills, the general linear model univariate procedure was used. The level of significance was set as a p value of less than .05 for all tests.

RESULTS
Demographic Data
From a total of 800 questionnaires distributed, 619 questionnaires were returned for a response rate of 77.4%. However, 70 were rejected because the questionnaires were incomplete or because participants did not meet the inclusion criteria, thus leaving 549 questionnaires in the final data analysis.

The majority of respondents were female (97.8%, n = 537), staff nurses (72%, n = 394), worked on medical units (52.5%, n = 288), and qualified with Certificate/Diploma in Nursing (71%, n = 391). The mean age of respondents was 34.5 (SD = 8.3) years, and the mean length of clinical experience was 10.7 (SD = 7.5) years (Table 2).

HSRT Scores
Descriptive analyses were undertaken to determine the mean overall and five domains scores of the HSRT (Table 3). Based on the guidelines in Table 1 (Facione et al., 2010), the results indicated the nurses in this study were generally weak in the overall score as well as in the five domains of critical thinking skills. The overall mean HSRT score for participants was 13.8 (SD = 3.4), and the majority of participants failed to manifest critical thinking skills (57.9%, n = 318) (Table 3). In addition, the majority of participants failed to manifest deduction (82.1%, n = 451) and analysis skills (57.4%, n = 315). As for the other three domains, the majority of participants scored moderately (Table 3).

Association Between Demographic Factors and Critical Thinking Skills
The general linear model univariate procedure was used to test the association between demographic variables and overall critical thinking scores. The tested variables were job ranking, clinical specialty, nursing educational qualifications, age, and years of clinical experience. Gender was not tested due to the small sample size of male nurses (2.2%). Table 2 presents the results.

<table>
<thead>
<tr>
<th>33-Point HSRT Score</th>
<th>Not Manifested</th>
<th>Moderate</th>
<th>Strong</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall score</td>
<td>0 to 14</td>
<td>15 to 20</td>
<td>≥21</td>
</tr>
<tr>
<td>Induction</td>
<td>0 to 4</td>
<td>5 to 7</td>
<td>≥8</td>
</tr>
<tr>
<td>Deduction</td>
<td>0 to 4</td>
<td>5 to 7</td>
<td>≥8</td>
</tr>
<tr>
<td>Analysis</td>
<td>0 to 2</td>
<td>3 to 4</td>
<td>≥5</td>
</tr>
<tr>
<td>Inference</td>
<td>0 to 2</td>
<td>3 to 4</td>
<td>≥5</td>
</tr>
<tr>
<td>Evaluation</td>
<td>0 to 2</td>
<td>3 to 4</td>
<td>≥5</td>
</tr>
</tbody>
</table>

Note. HSRT = Health Sciences Reasoning Test.
* Facione, Facione, and Winterhalter (2010).
The findings revealed nurses’ level of educational qualifications was significantly associated with their critical thinking skills. Based on a post hoc multiple comparison test, the mean critical thinking score for nurses with a degree and above was significantly higher compared with nurses with a postbasic/advanced diploma in nursing and a certificate/diploma in nursing ($p = .003$). Nevertheless, years of clinical experience was not significantly related to nurses’ critical thinking skills ($p = .996$), and neither age nor job ranking of nurses related to their critical thinking skills. However, the clinical specialty where the nurses worked was significantly related to critical thinking skills ($p = .022$) (Table 2).

**DISCUSSION**

The finding that the majority of RNs in the sample did not manifest the required level of critical thinking skill is a cause for concern. The mean score of 13.8 indicates the nurses in this study had a lower HSRT score compared with nurses from the United States (Cazzell & Anderson, 2016; Hooper, 2014; Lang et al., 2013; Maneval et al., 2012) and Australia (Hunter et al., 2014; Pitt, Powis, Levett-Jones, & Hunter, 2015). Perhaps it is too idealistic to compare Malaysian nurses with nurses from the United States and Australia. Compared with Malaysia, the United States and Australia have dialectically opposite societies in terms of liberalism and development, in addition to hav-
ing completely different cultural perspectives. Nevertheless, there are no other studies from Asian countries that have used the HSRT as a measurement tool to serve as a comparison with the findings of the current study.

The significant association between educational qualification and critical thinking skills supports the findings of earlier studies (Chang et al., 2011; Pitt et al., 2015). Chang et al. (2011) conducted a study on 570 clinical nurses with WGCTA and reported that critical thinking skills of nurses with Master of Nursing degrees were significantly better compared with nurses with a baccalaureate or associate nursing degree \((p < .001)\). However, the HSRT was not used in either of these studies and thus comparison to the current study may not be valid. Pitt et al. (2015) conducted a study of 28 baccalaureate nursing students using the HSRT and found that total critical thinking scores significantly \((p = .045)\) increased between entry and completion of the 3-year program. This significant increase in critical thinking scores implies that after 3 years, the degree program is likely to be effective in developing critical thinking skills for nurses (Pitt et al., 2015), which supports the findings of the current study.

Years of clinical experience was not significantly associated with nurses’ HSRT score \((p = .996)\), which is supported by previous studies (Hooper, 2014; Lang et al., 2013). The general assumption that with longer clinical experience, critical thinking will be improved does not seem justified. Therefore, the years of working experience is just a number that may not truly reflect competence in critical thinking, echoing the suggestion from Easen and Wilcockson (1996) that it is possible for one to have experience without expertise. Nonetheless, as shown in the

### TABLE 3

DESCRIPTIVE SUMMARY FOR TOTAL HSRT SCORES AND DOMAIN SCORES \((N = 549)\)

<table>
<thead>
<tr>
<th>Skill/Attribute</th>
<th>n</th>
<th>%</th>
<th>Mean ± SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overall score</strong></td>
<td></td>
<td></td>
<td>13.8 ± 3.4</td>
<td>6 to 25</td>
</tr>
<tr>
<td>Not manifested (0 to 14)</td>
<td>318</td>
<td>57.9</td>
<td>6 to 25</td>
<td></td>
</tr>
<tr>
<td>Moderate (15 to 20)</td>
<td>217</td>
<td>39.5</td>
<td>6 to 25</td>
<td></td>
</tr>
<tr>
<td>Strong (≥ 21)</td>
<td>14</td>
<td>2.6</td>
<td>6 to 25</td>
<td></td>
</tr>
<tr>
<td><strong>Induction</strong></td>
<td></td>
<td></td>
<td>4.7 ± 1.6</td>
<td>0 to 9</td>
</tr>
<tr>
<td>Not manifested (0 to 4)</td>
<td>254</td>
<td>46.3</td>
<td>0 to 9</td>
<td></td>
</tr>
<tr>
<td>Moderate (5 to 7)</td>
<td>267</td>
<td>48.6</td>
<td>0 to 9</td>
<td></td>
</tr>
<tr>
<td>Strong (≥ 8)</td>
<td>28</td>
<td>5.1</td>
<td>0 to 9</td>
<td></td>
</tr>
<tr>
<td><strong>Deduction</strong></td>
<td></td>
<td></td>
<td>3.1 ± 1.6</td>
<td>0 to 9</td>
</tr>
<tr>
<td>Not manifested (0 to 5)</td>
<td>451</td>
<td>82.1</td>
<td>0 to 9</td>
<td></td>
</tr>
<tr>
<td>Moderate (6 to 7)</td>
<td>93</td>
<td>16.9</td>
<td>0 to 9</td>
<td></td>
</tr>
<tr>
<td>Strong (≥ 8)</td>
<td>5</td>
<td>1</td>
<td>0 to 9</td>
<td></td>
</tr>
<tr>
<td><strong>Analysis</strong></td>
<td></td>
<td></td>
<td>2.3 ± 1.1</td>
<td>0 to 6</td>
</tr>
<tr>
<td>Not manifested (0 to 2)</td>
<td>315</td>
<td>57.4</td>
<td>0 to 6</td>
<td></td>
</tr>
<tr>
<td>Moderate (3 to 4)</td>
<td>221</td>
<td>40.3</td>
<td>0 to 6</td>
<td></td>
</tr>
<tr>
<td>Strong (≥ 5)</td>
<td>13</td>
<td>2.4</td>
<td>0 to 6</td>
<td></td>
</tr>
<tr>
<td><strong>Inference</strong></td>
<td></td>
<td></td>
<td>3.1 ± 1.3</td>
<td>0 to 6</td>
</tr>
<tr>
<td>Not manifested (0 to 2)</td>
<td>181</td>
<td>33</td>
<td>0 to 6</td>
<td></td>
</tr>
<tr>
<td>Moderate (3 to 4)</td>
<td>303</td>
<td>55.2</td>
<td>0 to 6</td>
<td></td>
</tr>
<tr>
<td>Strong (≥ 5)</td>
<td>65</td>
<td>11.6</td>
<td>0 to 6</td>
<td></td>
</tr>
<tr>
<td><strong>Evaluation</strong></td>
<td></td>
<td></td>
<td>3.1 ± 1.2</td>
<td>0 to 6</td>
</tr>
<tr>
<td>Not manifested (0 to 2)</td>
<td>173</td>
<td>31.5</td>
<td>0 to 6</td>
<td></td>
</tr>
<tr>
<td>Moderate (3 to 4)</td>
<td>319</td>
<td>58.1</td>
<td>0 to 6</td>
<td></td>
</tr>
<tr>
<td>Strong (≥ 5)</td>
<td>57</td>
<td>10.4</td>
<td>0 to 6</td>
<td></td>
</tr>
</tbody>
</table>

Note. HSRT = Health Sciences Reasoning Test (Facione, Facione, & Winterhalter, 2010).
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Among the other demographic variables tested, clinical specialty was the only factor found to be significantly associated with HSRT score. Findings showed nurses from surgical units had higher HSRT scores compared with nurses from medical units (p = 0.022). However, unlike the current study, a Taiwanese study conducted by Chang et al. (2011) found clinical units, including medical, surgical, intensive care, emergency, outpatient, pediatrics, and psychology units, were not significantly associated with nurses’ level of critical thinking (p = 0.635). This interesting finding requires more research to reveal why surgical nurses in Malaysia had better critical thinking skills, leaving the findings open to suggestions of subjectivity. A possible explanation for the contradictory findings of these two studies could be due to the difference in the clinical work culture in these two countries. However, further investigation of these findings is needed.

Age (p = 0.171) and job ranking (p = 0.408) were not associated with nurses’ critical thinking skills. The results were consistent with previous studies for age (Hooper, 2014; Hunter et al., 2014; Lang et al., 2013; Maneval et al., 2012). However, contradictory to the current study, job ranking was a significant predictor for nurses’ critical thinking skills in two Taiwanese studies (Chang et al., 2011; Feng et al., 2010), which suggests nurses’ critical thinking skills improve along with promotion of position and title. These different findings also may be due to methodological differences, as both Taiwanese studies used the Chinese version of the WGCTA instead of the HSRT. In addition, the nursing career ladder system between the two countries is different.

The findings of the current study suggest nursing education reform, which started in 1990 in Malaysia, may need further curriculum enhancement in the critical thinking arena, specifically for the Diploma in Nursing program. As found in this study, the majority of nurses in Malaysia were trained at the diploma level, and only a minority pursued higher education. The Diploma in Nursing curriculum in Malaysia often is too compact, with nursing students trying to complete all of the modules in six semesters (Malaysia Nursing Board, 2018). The curriculum comprises a large range of theoretical components. Educators often are pressured to deliver a large amount of content to facilitate students passing the final examination, which is equivalent to the licensing examination. Educators concentrate on delivering theoretical knowledge; hence, there is a lack of emphasis on problem solving skills and cultivating critical thinking skills among diploma nursing students.

Because lectures are used as the most essential teaching methodology, nurses are trained in an inflexible, controlling, and passive compliance manner, which leads to a lack of confidence in making independent clinical decisions. The type of nursing education that focuses on a fact-loading process does not prepare nurses with good critical thinking skills to solve complicated clinical problems. Therefore, the curriculum in nursing education needs to be enhanced in Malaysia with a critical thinking component introduced earlier at the diploma level. It is equally important for nursing leaders to motivate and seek avenues for nurses to pursue higher education. The importance of continuing education cannot be ignored; instead, continuing education needs to be reinforced to enhance critical thinking skills in the current nursing workforce.

In addition, as a primarily female profession, Malaysian nurses in general still assume a subservient role to medical dominance (Birks, Chapman, & Francis, 2009). Often, nurses’ opinions are not considered when it comes to decision making in patient care. Ahmad and Oranye (2010) noted the issue of empowerment among Malaysian nurses is still far behind that of nurses in Europe and North America. Consequently, clinical nurses often spend more time executing doctors’ orders and performing routine tasks that do not require critical thinking. This also may explain why years of clinical experience does not improve nurses’ critical thinking skills, as shown in this study.

LIMITATIONS

This study has some limitations. First, the multistage cluster sampling methodology should involve successive random sampling of units from large groupings to smaller groupings (Polit & Beck, 2017). Nevertheless, in this study, the final stage of randomization of sampling could not be carried out due to rejections of the ward and unit managers from all of the hospitals for the researcher to access the nurses’ name list or roster. Thus, the study was not able to achieve a full randomized sampling and instead resorted to convenience sampling, which may restrict generalizability of the findings. Nonetheless, this study has a sufficiently large sample size (n = 549), which may help in compensating some limitations yielded by nonrandomization in sampling.

Second, the procedure of data collection whereby the questionnaires in sealed envelopes were distributed by the ward or unit managers to the nurses was beyond the researchers’ control. The HSRT is a test, and nurses were supposed to answer the test similar to any sit-in examination. However, this was not feasible due to practicality constraints. If nurses had been able to answer the questionnaire in a controlled sit-in and timed examination setting, the results might have been more authentic in reflecting the true critical thinking level of Malaysian RNs.
IMPLICATIONS FOR PRACTICE

The findings of this study have implications for nursing education, practice, and research. It is timely that nurse educators seek solutions in revising nursing curricula that incorporate a critical thinking component and cultivate critical thinking skills among students by adopting more robust teaching methods that will motivate students to think critically. Several teaching strategies can be found in nursing literature that could develop critical thinking skills in nursing students, such as using videos and interactive activities in solving problems (June, Yaacob, & Yeoh, 2014), case studies and videotaped vignettes (Hooper, 2014), and problem-based learning (Kong, Qin, Zhou, Mou, & Gao, 2014). These teaching methodologies should be used instead of relying solely on the lecture mode in nursing curriculum. Perhaps it is timely to change the 100 multiple-choice questions as the assessment methodology for the final nursing licensing examination in Malaysia by incorporating subjective questions that involve solving clinical problems, which could promote critical thinking among nursing students.

Providing nurses with a higher level of education is perhaps another strategy to solve the current issue of low critical thinking skills among Malaysian nurses. Nurse leaders should encourage and motivate nurses to further their studies. Every opportunity should be given to nurses to further their studies by offering financial aid and time off from work for attending classes. In practice, nurse leaders should provide a clinical work environment that will encourage nurses to think critically and that will give nurses authority in shared clinical decisions for best patient outcomes. In addition, there is a need for policy change in the existing nursing education approach and in making continuing education mandatory for the current nursing workforce. Both should be focused on the development of critical thinking skills so that nurses are better prepared for more complex and constantly changing health care systems.

More rigorous studies are needed to explore critical thinking skills among Malaysian nurses. Because HSRT tool needs to be purchased, there is a need to develop a new tool that is readily accessible for future researchers to measure nurses’ critical thinking skills in Malaysia. However, the tool needs to be validated and culturally suited for Malaysian nurses. If such a tool were available, perhaps it would encourage researchers to conduct more studies in Malaysia that explore nurses’ critical thinking skills and thereby further substantiate the findings of the current study.

CONCLUSION

The increasingly complex health care environment requires that nurses have good critical thinking skills to make effective clinical decisions, solve complex clinical problems, and provide quality patient care. Many factors might determine nurses’ critical thinking skills, and nurses’ demographic characteristics should be considered.

Although there is no consistent finding across nursing research regarding whether educational qualifications or clinical experience significantly contribute to better critical thinking skills, the findings of this study demonstrate nurses’ educational qualifications are significantly related to their critical thinking skills. Nurses with lower educational qualifications tend to have lower score in critical thinking skills. Perhaps the only hope is that through pursuing higher education qualification, such as a Master of Nursing or a Doctor of Philosophy degree, combined with empowerment of nurses in clinical decision making, nurses in Malaysia will acquire better critical thinking skills and deliver better quality patient care.

Although this is the first research study conducted among Malaysian nurses, more studies are needed to further support the notion that higher educational qualification enhances critical thinking skills. It is time for nurse educators, leaders, and researchers to collaborate so that all efforts are focused on developing future nurses who not only know what to think, but also how to think.

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