Scientific Inquiry Level of Nursing Students: Clinching Clinical Performance Expertise

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Abstract

Background: The status of inquisition by the nursing students shall be determined as it will be utilized as a tool to measure their clinical performance expertise as future nursing practitioners. The element of scientific inquiry is essential in providing standard fillers to give meaning to the various practical nursing gaps in the actual field, the hospital ward to be specific. **Objective:** This research study aims to establish the level of scientific inquiry and clinical performance of undergraduate Arab nursing students. **Methods:** The researcher utilized descriptive-correlational study as the research design. This is a descriptive study because it describes the level of scientific inquiry and level of clinical performance of the undergraduate Arab nursing students. **Results:** The finding of the study is that "the majority of the Arab student nurses demonstrate a guided inquiry in their scientific inquiry level". Most of the Arab student nurses demonstrate a guided inquiry ($\bar{x}$ = 2.74, SD ± 0.99) in terms of their level of scientific inquiry. Largely, the Arab student nurses have proficient level in their level of clinical performance ($\bar{x}$ = 87.32, SD ± 12.36). Regression analysis revealed a no significant relationship (r^2 = 0.57; adjusted r^2 = 0.57; p > 0.005) between the level of scientific inquiry and clinical performance among Arab student nurses. **Conclusions:** The study concluded that the majority of the Arab student nurses demonstrated a guided inquiry in their scientific inquiry level and a moderately proficient level of clinical performance. Furthermore, the study concluded that the level of scientific inquiry was not significantly related to clinical performance.

Keywords

Scientific Inquiry, Clinical Performance, Proficiency, Expertise

1. Introduction

Low level of scientific query is effective in understanding theoretical concepts and knowledge among nursing students [1]. Unfortunately, studies have shown

that the majority of the nursing students demonstrate only lower level of scientific inquiry and are not sufficient enough in promoting their critical thinking and scientific thinking. Thus, this can affect the maximum capacity of the students [2] [3]. The need to achieve higher level of scientific inquiry enables the nursing students to conduct scientific investigation by identifying clinical problems, integrating research questions, performing problem-solving methods, disseminating and translating study findings to actual nursing practice [4]. Furthermore, scientific inquiry-inspired learning allows the student nurses to develop scientific inferences by uncovering current gaps and documented information, innovating research design and experiments, and demonstrating effective data collection procedures that can lead to acceptable and valid interpretations of data [5]. Thus, the learning progression will eventually help nursing students improve their skills and clinical competence levels in clinical health care settings [6] [7].

Scientific inquiry encompasses beyond the simple elaboration of process skills such as perceiving, reasoning, organizing, foreseeing, quantifying, probing, inferring and examining data. Scientific inquiry contains the conventional science processes, but likewise denotes to the merging of these processes with scientific knowledge, scientific reasoning and critical thinking to construct scientific knowledge. The element of scientific inquiry is essential in providing standard fillers to give meaning to the various nursing gaps in the actual nursing practice.

Studies have even cited that nursing graduates are not capable and not displaying clinical skills competency in the clinical areas during the clinical practicum [8]. Numerous nursing students reported a deficiency of clinical performance and competency with respect to their capacity to achieve nursing responsibilities [9]. Furthermore, there had been limited studies about the capability to utilize scientific information for clinical nursing decision-making.

This prompted the researcher to develop the research study entitled "Scientific Inquiry Level of Nursing Students: Clinching Clinical Performance Expertise". The ultimate aim of the study is to determine the clinical performance expertise of the nursing students by identifying the scientific inquiry levels of the nursing students. The foregoing categories of scientific inquiry are expected to momentously impact the clinical performance expertise of the nursing students of Fakeeh College for Medical Sciences to better prepare them to more technical and more intensive hospital experience in the future. The research endeavor is conducted with a basic philosophical truth that what is textually stated in nursing books may not actually be exactly what a professional or a student nurse may encounter in a real hospital experience. The status of scientific inquisition by the nursing students shall be determined as it will be utilized as a tool to measure their clinical performance expertise as future nursing practitioners.

1.1. Conceptual Framework of the Study

The diagram explains the conceptual framework that will guide the conduct of the study as presented in Figure 1. Accordingly, this framework correlates students'
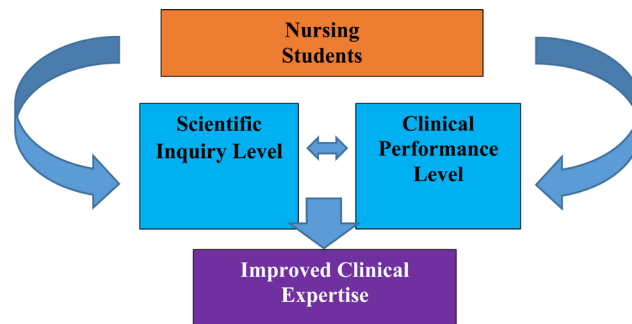
Figure 1. The conceptual framework of the study.

scientific inquiry and clinical performance levels of the nursing students. Thus, the randomly selected nursing students of Fakeeh College for Medical Sciences will be evaluated on their scientific inquiry levels as this may deliver significant relationships on the area of clinical performance. Overall, the supreme intention of this study is the improved clinical expertise of the nursing students to better prepare them as professional nurses in near future.

1.2. Research Objectives

This research study aims to establish the level of scientific inquiry and clinical performance of undergraduate nursing students in a private university in Saudi Arabia.

1) What is the level of scientific inquiry of the Arab nursing students?

2) What is the clinical performance level of the Arab nursing students?

3) Is there a significant relationship between the level of scientific inquiry and clinical performance levels of the undergraduate Arab nursing students?

2. Research Methods

2.1. Study Design

The researcher utilized descriptive-correlational study as the research design. This is a descriptive study because it described the level of scientific inquiry and level of clinical performance of the undergraduate nursing students in a private college in Saudi Arabia. Moreover, this study used correlational study design because it determined the presence of significant relationship between scientific inquiry and clinical performance of the nursing students.

2.2. Research Setting

The study was employed at FCMS Nursing Department in Jeddah, Kingdom of Saudi Arabia from December 2018 to January 2019. The study setting is located at Abdul Wahab Naib Al Haram, Al-Hamra'a, Jeddah 23323, Kingdom of Saudi Arabia.

2.3. Samples

Using Krejcie and Morgan sample size determinant formula, the researcher se-

lected 172 nursing students from a total of 214 study population. The samples were selected using purposive sampling using inclusion and exclusion criteria. Inclusion criteria of the study enable the nursing students as respondents to partake in the study. Such criteria includes: 1) must be a regular nursing student; 2) must be currently enrolled in Fakeeh College for Medical Sciences (previous and current semesters); 3) must be a full-time student. Exclusion criteria which made the nursing students not allowed participating in the study. This include: 1) bridging program nursing students; 2) preparatory students who wants to take nursing program; 3) irregular and part-time nursing students.

2.4. Research Instrument

The research instrument on scientific inquiry level was adapted from Lederman Concept (2018). On the other hand, the clinical performance level of students will be based on the professor's evaluation ratings under the area on clinical practice Construct and content validation of instruments was conducted by three experts in nursing profession. Cronbach Alpha score was 0.85 which made the instrument tool to be reliable and internally consistent.

2.5. Data Analysis

Using IBM SPSS 5.0 software package, the following statistical formulas were utilized: summation rating scale, mean and standard deviation for the descriptive statistics and regression analysis for the inferential statistics.

3. Results

Table 1 shows that most of the Arab student nurses demonstrate a guided inquiry ($\overline{x}$ = 2.74, SD ± 0.99) in terms of their level of scientific inquiry as presented in Table 1. Specifically, the majority of the Second Year BSN students demonstrates a guided inquiry level with a mean score ($\overline{x}$ = 2.64, SD ± 1.18). Meanwhile, Third Year BSN students also demonstrate a guided inquiry level with a mean score of ($\overline{x}$ = 2.82, SD ± 0.95). Lastly, Fourth Year BSN students also demonstrate a guided inquiry level ($\overline{x}$ = 2.75, SD ± 0.85) in their scientific inquiry.

Table 2 shows that largely of the Arab student nurses are proficient level in their level of clinical performance ($\overline{x}$ = 87.32, SD ± 12.36) as presented in Table 2.

Table 1. Arab nursing students' level of scientific inquiry.

Year Level of Arab Nursing Students	Mean	SD	Level of Scientific Inquiry
1. Second Year BSN students	2.64	1.18	Guided Inquiry Level
2. Third Year BSN students	2.82	0.95	Guided Inquiry Level
3. Fourth Year BSN students	2.75	0.85	Guided Inquiry Level
Total Score	**2.74**	**0.99**	**Guided Inquiry Level**

Legend: 1.0% - 1.75% Exploration level; 1.76% - 2.50% Direct inquiry level; 2.51% - 3.25% Guided inquiry level; 3.26% - 4.00% Open-ended inquiry.

Table 2. Arab nursing students' clinical performance level.

Year Level of Arab Nursing Students	Mean	SD	Clinical Performance Level
1. Second Year BSN students	83.98	19.39	Proficient
2. Third Year BSN students	89.28	9.12	Proficient
3. Fourth Year BSN students	88.69	8.58	Proficient
Total Score	**87.32**	**12.36**	**Proficient**

Legend: 91.0% - 100.0% Highly Proficient; 81.0% - 90.0% Proficient; 71.0% - 80.0% Slightly Proficient; 61.0% - 70.0% Not Proficient.

Table 3. Correlation between level of scientific inquiry and clinical performance.

Regression Statistics			
Multiple R		0.758616045	
R Square		0.575498304	
Adjusted R Square		0.573001235	

	Coefficients	*Stand. Error*	*t Stat*	*p-Value*
Intercept	54.78637846	2.20330895	24.86549989	1.61374E−58
Marks	11.52423748	0.759111253	15.18122335	1.87916E−33

Specifically, the majority of second, third- and fourth-year BSN students demonstrated proficiency in their clinical performance in the clinical practice with mean scores and standard deviation of $\bar{x}$ = 83.98 (SD ± 19.39), $\bar{x}$ = 89.69 (SD ± 9.12), and $\bar{x}$ = 88.69 (SD ± 8.58), respectively.

Table 3 illustrates that the study aimed to test the significant relationship between the level of scientific inquiry and clinical performance. Furthermore, Regression analysis revealed a no significant relationship (r^2 = 0.57; adjusted r^2 = 0.57; p > 0.005) between the level of scientific inquiry and clinical performance among Arab student nurses. Thus, moderate r square value (r^2 = 0.57 or 57%) is not sufficiently high enough to make a prediction that the level of scientific inquiry is a predictive factor in the clinical performance among student nurses.

4. Discussion

The finding of the study that "the majority of the Arab student nurses demonstrate a guided inquiry in their scientific inquiry level" is supported by studies of Chuang, Cormack, Kim, Gunay, Borg Sapiano, and Oldland. Guided Inquiry ranks third in the level of scientific inquiry. Clinical problems are provided as the nursing students are required to present their own drafts of solutions. Under this level, nursing students have the chance to harness their clinical and analytical skills to sustain their own evidence-based conclusions to the problems being explored. At this level, opportunities among students to take complex responsibilities during the clinical investigations are required as students may have independent choices of methods, materials, data organization, analysis, and con-

clusions. Specifically, based on the finding of the study Chuang (2018), nursing students' level of knowledge has significantly improved (F = 4.219, p = 0.04) [10]. In addition, Cormack (2018) cited that standardized patients' assessment of the nursing students' performance in the domain of knowledge yielded high scores of 96% in all OSCEs. Preceptor appraisal scores bared the prime upsurge in knowledge and learning skills (NONPF domain 1) among nursing students with an average of 90% - 95% [11]. Kim (2018) emphasized in her study that nursing students uncovered a significantly higher value for theoretical knowledge (t = 3.34, p = 0.001) in the clinical nursing practice [12]. Furthermore, the study of Günay (2018) observed that most of the nursing students recounted that theoretical knowledge and information they have taken was disproportionate [13]. Findings of Borg Sapiano (2018) revealed a significant enhancement in the students' clinical scenario knowledge (z = −6.506, p < 0.001) [14]. Lastly, Oldland (2017) stated that the Team-Based Learning (TBL) is a teaching strategy that is conceived to encourage problem-solving and critical thinking. Data analysis revealed two significant themes emerged: deep learning (the adaptations students constructed to their learning that ensued in a mastery of specialist knowledge) and assurance in knowledge, problem-solving and rationales for practice decisions. Thus, TBL enabled a worthy sequence of response reassuring deep learning [15]. Thus, the findings of this current study has no difference and is supported by similar other studies which clearly showed that the nursing students' scientific inquiry for theoretical knowledge is considerably of high level.

The finding of the study that "Majority of the Arab student nurses demonstrates demonstrated a moderately proficient level of clinical performance" is congruent with the studies of Chuang, Cormark, Kim, Borg Sapiano, Park, Ye, Kopp, Malekzadeh, Aboshiaqah, and Shahsavari. Based on the finding of the study Chuang (2018), nursing students' level clinical nursing skills were improved (F = 4.219, p = 0.04). Thus, nursing students demonstrated clinical skills competency as evidenced by right and suitable execution of nursing skills to guarantee patient safety and quality nursing care [10]. As cited by Cormack (2018), the consistent patients' appraisal of the nursing students' performance in the domain of clinical nursing skills showed high scores of 96% in all OSCEs. Thus, this validates nursing student's development from novice to competent in the clinical practice [11]. Also, Kim (2018) emphasized that nursing students' level of clinical nursing skills and nursing skills performance were significantly enhanced and improved (t = 7.05, p < 0.001). Clinical nursing practice is significant because it aids nursing students to encounter the realisms of clinical nursing that cannot be absorbed through theoretical education [12]. Furthermore, findings of Borg Sapiano (2018) showed that the highest mean clinical performance scores were acquired in the clinical scenario (M = 19.7, S.D. 3.41) [15]. A study by Park (2018) revealed that the mean scores in clinical competence for senior nursing students were significantly higher after an intensive clinical nursing skills course despite limited opportunities in the clinical practicum settings [16].

Ye (2018) even cited that improved clinical performance was observed among practicing nursing students. Hence, clinical performance is viewed as a primary and fundamental content of nursing quality [17]. Moreover, Kopp (2018) stated that a statistically significant improvement was found between midterm ($\overline{x}$ = 0.89) and final performance ($\overline{x}$ = 0.94; t = −15.90; p < 0.001, two-tailed) showing an increase in final clinical performance among student nurses using the grading rubric [18]. Also, the clinical performance mean score among nursing students was significantly high as cited by Malekzadeh (2018). Thus, this study showed a significant improvement in nursing students' level of clinical performance [19]. The finding of the study by Aboshiaqah and Qasim (2018) revealed that the preceptorship program heightened the clinical competencies among nursing student interns in the clinical setting. Specifically, enhanced clinical competence was noted primarily in priority-setting, multitasking, expressing complex nursing skills, and the conveyance of quality nursing care [20]. Lastly, the results of the study by Shahsavari (2017) specified that the students who took part in the primary clinical skills refresher course experienced better nursing skills clinical performance during their internship program [21]. Thus, the findings of this current study has no difference and is supported by similar other studies which explained that the nursing students demonstrates an competence and proficient level in terms of clinical performance.

The result of the study that "There is no significant relationship between the level of scientific inquiry and clinical performance among Arab student nurses" is supported by studies of Park, Ye, Aboshiaqah, Pai, and Oldland. Accordingly, Park (2018) revealed that the rigorous clinical skill courses had an optimistic effect on senior nursing students' clinical competence for the core clinical nursing skills. Nursing education requires the integration of knowledge and practice. This study highlights the substance of re-education of theoretical knowledge utilizing a clinical nursing skills course during the transition from student to nursing professional is needed [16]. In addition, Ye (2018) stated that scientific evidence is needed to develop intervention strategies to improved clinical performance [17]. Aboshiaqah and Qasim (2018) even added that the preceptorship program is an effective teaching strategy that helps develop and enhanced the clinical competencies among nursing students. Hence, preceptorship program absolutely influences nursing student interns' clinical skills in handling actual patients in a clinical setting [20]. Furthermore, Pai (2016) stated that the regression coefficient (β) estimate of −0.41 (p < 0.05) changed to β = −0.15 (p < 0.05), indicated that learning effectiveness interceded the relationship in nursing competence and clinical nursing performance. Thus, learning can have an optimistic impact on the students' level of nursing competence and auxiliary upholds students' clinical care competence [22]. Lastly, Oldland (2017), improved deep learning and assurance in knowledge and justifications for practice decisions directed to the expansion of professional and clinical behaviors characteristic of high-quality nursing practice and clinical performance [15]. On the other hand, the study findings is contradicted by studies of Gunay, Borg Sapiano and Kopp.

Accordingly, the study of Gunay (2018) observed that most of the nursing students reported that their proficiency to situate largely of this theoretical knowledge and information into the clinical practice was frail and usually futile. Furthermore, the study resulted that the nursing students discovered their clinical knowledge and nursing skills inadequately [13]. Furthermore, findings of Borg Sapiano (2018) showed that knowledge was not a predictor of nursing students' nursing performance in the clinical scenarios. Many nursing students subsequently not experience and assimilate the management of patient deterioration into their knowledge and practical competency, crafting them unready to succeed in such conditions as practicing nurses [14]. Lastly, Kopp (2018) stated that no correlation was found between final written examination and clinical performance evaluations ($r = .16$, $p > 0.05$), and a significant difference was noted between written examination ($\overline{x} = 0.973$) and clinical performance evaluations ($\overline{x} = 0.92$; $t = 14.54$; $p < 0.001$). [18] Although 3 studies have contradicted the findings of the current study, but the findings of study are mostly supported by 5 similar other studies which explained the direct causal relationship between the level of scientific inquiry for theoretical knowledge and clinical performance, competency and proficiency among nursing students.

5. Conclusion

The study concluded that the majority of the Arab student nurses demonstrated a guided inquiry in their scientific inquiry level and a moderately proficient level of clinical performance. Furthermore, the study concluded that the level of scientific inquiry was not significantly related to clinical performance.

6. Recommendation

The study recommends an improved and updated nursing curriculum that will include various teaching strategies and learning outcomes in improving scientific inquiry and theoretical knowledge among student nurses. Likewise, the need to improve nursing training internship program to enhance nursing technical skills and clinical performance among student nurses is encouraged. Lastly, more studies must be conducted in other regions in Arabian Peninsula to determine the level of scientific inquiry and assess the clinical competencies among nursing students. Also, future studies are recommended to test the relationship between scientific knowledge and clinical performance among nursing students.

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Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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