



Students' First Time Performance of Basic Nursing Procedures at Tobruk University

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ABSTRACT

The study analysed the first-time performance of basic nursing procedures by Tobruk University students of nursing. These involve medical handwashing, clean gloving, range of motion (ROM), and positioning. The result of the study indicated a moderate level of performance in terms of the mean score at 51.33 with an overall variance of SD=19.96. The highest mean score was found in Universal precaution clean gloving (53.96), which means the students understood the importance and practicability of this procedure. The lowest mean was recorded in positioning (43.93) while ROM had the highest variance (SD=26.66), which implied that these operations turned out to be more problematic for properly evaluating patient comfort and safety levels. While some variations in the mean scores were observed between male and female students, statistically significant differences were found in ROM and positioning (p-value < 0.05). Female students scored higher in both areas probably because of care or learning style preferences. Recommendations based on the findings were that personalized teaching, in-depth instruction, simulation learning, and continuous assessment of teaching methods are essential for student comprehension and application of these procedures. The outcomes can inform targeted education interventions and allow the students to master clinical practice more effectively. For future research, an increased sample size and other mediating variables could illuminate the role of gender in influencing performance for nursing education.

أداء الطلاب لأول مرة لإجراءات التمريض الأساسية في جامعة طبرق

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الكلمات المفتاحية:

تعليم التمريض
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تجربة التعلم ذات الصلة
احتياطات عالمية.

المخلص

اجريت هذه الدراسة بغرض تقييم المهارات التمريضية الأساسية لأول مرة من قبل طلاب التمريض بجامعة طبرق. حيث شملت غسل اليدين الطبي، لبس القفازات النظيفة، نطاق الحركة، و الوضعية السليمة. حيث اثبتت نتيجة الدراسة إلى وجود مستوى متوسط من الأداء من حيث متوسط الدرجات عند 51.33 وانحراف معياري قدره 19.96 و كان أعلى متوسط درجات في لبس القفازات النظيفة و الالتزام بالمعايير الاحترازية العالمية للتحكم في العدوي (53.96)، مما يعني أن الطلاب فهموا أهمية هذا الإجراءات وإمكانية تطبيقه. تم تسجيل أقل متوسط في اختيار الوضعية الصحيحة (43.93)، في حين سجل مدى التطبيق الحركي أعلى تباين (26.66). في حين لوحظ بعض الاختلافات في متوسط الدرجات بين الطلاب والطالبات، حيث وجد فروق ذات دلالة إحصائية في تطبيق نطاق الحركة و اختيار الوضعية الصحيحة حيث كانت القيمة المعنوية (<0.05). سجلت الطالبات درجات أعلى في كلا المجالين ربما بسبب الاهتمام أو تفضيل أسلوب التعلم. وكانت اهم التوصيات هي أن التدريس الشخصي، التعليم المتعمق، والتعلم بالمحاكاة، والتقييم المستمر لطرق التدريس ضرورية لفهم الطلاب وتطبيق هذه المهارات، ايضا توصي الدراسة باجراء بحث في المستقبل، بزيادة حجم العينة و اضافة بعض المتغيرات لالقاء الضوء على دور الجنس في التأثير على الأداء في تعليم المهارات التمريضية.

1. Introduction

A defining moment for every nursing student is the transition from theory to practice. Learning and mastering basic nursing procedures

serves as the foundation of this transition, providing future nurses with the necessary skills to deliver safe and effective care. However, to

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understand students' initial performance and work on the optimization of their learning as well as building self-confidence, it is essential to go through a procedure for the first time.

Besides the more technical aspects of the procedure itself being addressed, this study will address the particular importance of universal precautions such as medical handwashing and clean gloving. These skills underpin infection control and patient safety; therefore, in combination with the procedure technique, students obtain a comprehensive insight into safe and effective patient care. Using appropriate protective barriers (gloves, masks, gowns, and eyewear) to prevent contact with potentially infectious materials, and handling sharps safely, the universal precautions practice applies the fundamental principle of infection control [1]. One of the most crucial and successful methods of infection control is handwashing [2], but prior research has demonstrated that handwashing habits are inadequate, particularly among medical professionals [2-3] and students as well [4-5]. Even though it seems so obvious, hand washing is not a regular practice [6]. In the context of clean gloving, it has been suggested that gloves be worn during all patient interactions as an alternative to contact precautions for infection prevention [7]. By implementing the core principles of infection prevention, universal precautions are intended to shield medical personnel from potentially contaminated blood and bodily fluids [8, 9], which include both gloving and handwashing. Cross-transmission increases when clinical gloves are used incorrectly and are not changed between procedures thus the significance of hand hygiene compliance has received a lot of attention [10] and must be performed.

Additionally, the student's ability to integrate principles of range of motion (ROM) and positioning demonstrates their understanding of patient comfort and safety during the procedure. ROM is a successful preventive measure to stop patients' muscles from weakening and their muscle strength from decreasing [11]. ROM exercises can help preserve or enhance the optimal level of muscle tone, strength, and joint mobility; thus ROM can promote muscle strength build-up and can also be started at a young age [12]. When giving nursing care, ROM can be utilized as a nursing intervention [13]. Patients who suffered a stroke [12], impaired physical mobility [14, 15], those with neck and back pain [16] and care for the elderly [17] among others have benefited from applying ROM exercises. Finally, acquiring a high-quality diagnostic image and guaranteeing patient safety and comfort depend on precise positioning [18]. An improved outcome and a shorter stay in the critical care unit can be achieved by carefully positioning the critically ill patient to maximize gas exchange [19]. The position affects the potential injury sites and types of surgical patients [20]. Patients with ulcers may experience prolonged cell deformations, decreased tissue oxygenation, and possibly even tissue damage if they are unable to reposition [21-25], encompassing the need for careful and proper patient depending on the patient's injury or disease.

This research seeks to investigate students' integration of these essential components along with the technical processes of the selected method. This first meeting with the procedure is important for establishing an understanding of students' strengths and weaknesses, including their handling of universal precautions, ROM, and patient positioning that could potentially inform targeted educational interventions. Identifying their unique challenges and learning needs, the development of effective training strategies, simulation activities, and assessment tools to enhance their practical skills and confidence is near. This, in turn, will improve their readiness for the actual clinical practice and eventually promote the provision of quality patient care by future nurses.

Thus, this research goes beyond the technical proficiency of the selected procedure. It studies the overall effectiveness of first-time nursing students at Tobruk University, including their compliance with universal precautions, use of proper ROM and patient positioning techniques as well as confidence level and ability to navigate this important practical phase in their nursing education.

The study addresses the following research question:

1. How do first-time nursing students at Tobruk University perform in four basic nursing procedures (medical

handwashing, clean gloving, ROM exercises, and patient positioning)

2. Is there a significant difference in performance between male and female students?

2. Materials and Methods

This study focused on first-time nursing students' performance in a specific basic nursing procedure that incorporates universal precautions (medical handwashing, clean gloving), ROM, and patient positioning. A quantitative method using observational data collection was employed.

Quantitative data:

Performance Assessment: The researchers also used a pre-defined checklist developed from validated tools to evaluate the student's performance on the combined procedure. This checklist assessed specific elements such as technique accuracy, time taken, compliance with safety rules, and patient interaction at every step of the procedure (handwashing, gloving, ROM, and positioning).

Observational data:

Direct Observation: Specially trained observers observed students performing the procedure directly, using a predefined observation checklist to measure their adherence to technique, patient communication, and overall professionalism in the process.

Sampling:

Convenience sampling was used to recruit first-time nursing students within the specific semester/course where the chosen procedure is taught. A total of 100 students, with 11 male and 89 female were selected for the study after sampling.

Inclusion/Exclusion criteria:

The authors included the 1st year students from 1st semester of academic year 2022-2023. The result was taken from the return demonstration of students after the procedure was taught in their class by clinical instructors using the student performance checklist.

Data measures:

The collected data were tallied and arranged into tables. Mean and standard deviation (SD) were calculated for each of the four procedures together with the overall mean. T-tests assuming equal variance were used to test the statistical difference between genders. Mini Tab version 17 and MS Excel were used for the computation and graphical presentation.

Ethical Considerations:

Before the collection of data, informed consent was obtained from each participant. Participants' confidentiality and anonymity were upheld during the entire study.

Expected Findings:

This study is expected to provide valuable insights into the strengths and weaknesses of first-time nursing students at Tobruk University in performing the combined procedure of medical handwashing, clean gloving, ROM exercises, and patient positioning. This might shed light on challenges that are common to all students and likewise utilize the results for practical use in curriculum development or training program planning for improving student competence and confidence. The data can be used to guide the design of development programs, simulation exercises, and assessment tools meant to deal with identified barriers and improve student learning outcomes in these core basic nursing skills. This may increase students' readiness for the practice in real-life clinical settings and assist in promoting better patient safety as well as care from future nurses.

Limitations:

Limitations of this study include the use of simulated settings and the possibility of a subjective bias in observations. However, future research should utilize a qualitative observational method in the actual clinical setting and triangulate positive findings with other data sources to address these limitations.

3. Results

This section shows the first-time performance of nursing students at Tobruk University in a specific basic nursing procedure. The analysis focuses on key aspects like medical handwashing, clean gloving, ROM, and positioning, highlighting strengths and weaknesses in their initial attempts.

The overall mean score for all procedures was 51.33, indicating that students demonstrated a moderate level of proficiency in the procedure as shown in Table 1. However, there was a significant standard deviation (19.96) across all parameters, suggesting considerable variation in individual performance. Universal precaution procedure clean gloving got the highest mean score (53.96) while medical handwashing was third (53.64). This suggests that students grasped the importance of these procedures and demonstrated a good understanding of their technical aspects. ROM received the second-highest mean score (53.80), however, the high standard deviation (26.66) indicates that some students struggled with correctly assessing and maintaining patient ROM during the procedure. The positioning of the patient had the lowest mean score (43.93), falling below the overall mean. The high standard deviation (19.86) further emphasizes the challenges students faced in achieving optimal patient positioning.

Table 1: Students' Performance in Basic Nursing Procedure.

Procedure	Mean	SD
Medical Handwashing	53.64	16.28
Clean Gloving	53.96	17.04
Range of Motion	53.80	26.66
Positioning	43.93	19.86
Overall Mean	51.33	19.96

While there was some variation in mean scores between male and female students, only two procedures – ROM and positioning – showed statistically significant differences (p values < 0.05) as seen in Table 2. Female students scored significantly higher in both parameters (55.74 vs. 38.09 for ROM and 45.37 vs. 32.27 for positioning). This suggests that female students may have a slight advantage in these areas, possibly due to anatomical or other factors. The mean scores for medical handwashing, clean gloving, and overall mean did not differ significantly between male and female students (p values > 0.05). This suggests that both genders demonstrated similar proficiency in these essential aspects of the procedure. Fig. 1 shows the graphical presentation of student's performance according to gender.

Table 2: Difference in Performance According to Gender.

Procedure	Gender	Mean	T-stat	P Value
Medical Handwashing	Male	52.45	-0.2547	0.7995
	Female	53.79		
Clean Gloving	Male	53.18	-0.1600	0.8734
	Female	54.06		
Range of Motion	Male	38.09	-2.1071	0.0377
	Female	55.74		
Positioning	Male	32.27	-2.0991	0.0384
	Female	45.37		
Overall Mean	Male	44.00	-1.9092	0.0592
	Female	52.24		

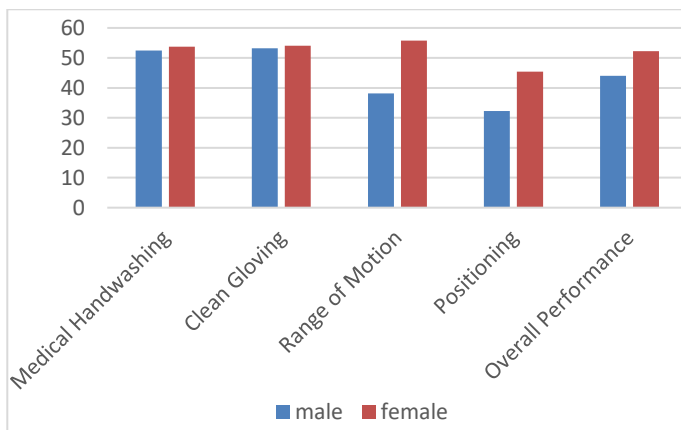


Fig. 1: Comparative chart between male and female

These findings suggest that while there are some minor differences in

performance between male and female students, the overall impact of gender on first-time performance in this particular procedure appears limited. Both genders demonstrated a basic level of proficiency in most areas, with female students having a slight advantage in ROM and positioning.

4. Discussion

This research investigated the first-time performance of nursing students in basic nursing procedures, revealing both promising strengths and areas for improvement. While the overall mean score of 51.33 reflects a moderate level of proficiency, the significant standard deviation of 19.96 underlines the wide range of individual performance. This suggests that understanding and addressing student variability is crucial for optimizing learning and skill mastery. A study has demonstrated that nursing students have a variety of learning styles that were influenced by several variables and that these styles shift and adapt based on the situation [26]. Furthermore, another study linked variability during clinical skills training to collaborative problem-solving abilities, level of competence, learner motivation, and role clarification [27]. The current study found during the return demonstration that higher-performing individuals possess competence and the ability to respond properly in different scenarios. On the other hand, lower-performing students mostly show hesitation, low nonverbal interaction, and disinterest, indicating low motivation, less competence, and uncertainty about their role.

The high mean scores for clean gloving (53.96) and medical handwashing (53.64) are encouraging, indicating that students grasped the importance of these fundamental infection control practices and demonstrated good technical understanding. These findings highlight the effectiveness of current educational strategies in emphasizing the critical role of universal precautions in ensuring patient safety. A hands-washing practice proved to be a successful tactic in improving nursing students' abilities to practice good hand hygiene [28], suggesting a hands-on demonstration before performance to be a successful strategy. Interest and improvement in hand hygiene might also be associated with the onslaught of Covid-19 [29-30]. Another study also revealed that nursing college students demonstrated a higher degree of proficiency with the universal precautions including clean gloving and medical handwashing, and when it comes to knowledge and application of universal precautions, the group receiving instruction about them is better equipped than the group receiving no such instruction [31].

While ROM received a relatively high mean score (53.80), the substantial standard deviation (26.66) reveals significant individual challenges in accurately assessing and maintaining patient comfort during the procedure. It was even shown in a study that despite improved school performance, students' ROM accuracy did not significantly improve based on joint assessment, and post-learning did not significantly impact self-efficacy or accuracy [32], indicating the difficulty and variability among individual students. Similarly, the low mean score and high standard deviation for positioning (43.93 and 19.86) highlight the difficulties students faced in achieving optimal patient positioning. According to the participants of a particular study, one of the hardest things in their practice to get right is patient positioning [33], signifying why this procedure is the lowest scoring among the students' performance. These findings suggest the need for targeted interventions to improve student understanding and practice in these crucial aspects of patient care.

The analysis also revealed statistically significant differences in performance between male and female students for ROM and positioning. Female students scored significantly higher in both areas, possibly due to factors like attention to care or learning styles. While the differences in mean scores for medical handwashing, clean gloving, and overall mean were not statistically significant, this does not preclude the possibility of subtle gender-based variations in skill development. A study comparing grade point averages discovered that male students performed poorer academically than female students in nursing education [34], this might suggest why female participants performed better than their male counterparts. However, more research exploring individual learning needs and preferences could shed light on these nuances and inform more personalized educational approaches.

These results have serious implications for nursing education and practice. First, the study emphasizes the need to personalize instruction and offer differentiated support as a response to student variability in skill development. Second, to improve the identified challenges of range motion and positioning, new ways of teaching and simulation exercises are supposed to be developed. Thirdly, identifying possible gender differences in the development of skills implies that there is a need to be addressed with inclusive educational practices that respond to the different learning styles and needs.

5. Recommendation

Focus on ROM and positioning: Those areas yielded the lowest mean scores and largest standard deviations, suggesting that participants needed more in-depth education on assessment and safety for patients during that procedure.

Individualized feedback and support: The significant variation in results implies that individuals require customized feedback and assistance based on their strengths and weaknesses.

Simulation-based learning: By using real-life simulation in the curriculum, it may be possible for students to have an opportunity to practice their skills within a safe environment before venturing into clinical settings.

Continuous assessment and refinement: By checking student performance regularly and adjusting the teaching methods as per the feedback received from students can ensure that the educational strategies are effective in enabling mastery of skills and readying students for clinical practice.

6. Conclusion

Exploring students' initial performance in fundamental nursing procedures is essential for developing clinical competence and instilling confidence in them. This study intends to add to this vital area by analysing the results of student performance and influencing factors at Tobruk University. These findings can help develop focused educational interventions and improve students' readiness for actual clinical practice. This study presents some initial findings regarding gender differences in a first-time performance of an explicit basic nursing procedure. Although there are some statistically significant differences in the ROM and positioning, gender seems to have overall limited effects. It is necessary to conduct further research with larger samples and investigate other determinant factors to understand gender and performance in nursing education better.

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