

Performance of Fourth Year Nursing Students on Advanced Nursing Procedures at Tobruk University

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DOI: <http://doi.org/10.38177/AJBSR.2023.5103>

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Article Received: 12 December 2022

Article Accepted: 27 January 2023

Article Published: 08 February 2023

ABSTRACT

The research used quantitative study with natural experiment design for analysis of respondent performance in INP 3 exam procedures in CPR, Heimlich maneuver, insertion of catheter and NGT, and identification of instruments which will be referred as advance nursing procedures. Study participants are 4th year students of INP 3 of College of Nursing from Tobruk University. Result of the study shows that the students are competent enough in advance nursing procedures and fit to work as nurses in the future with an overall mean of 67.13, were repeaters has a mean of 59.97 and 70.59 for regular students. A significant difference were observe with a p-value of 0.000669 between the two groups.

Keywords: Nursing, CPR, Heimlich maneuver, NGT, Catheter, Instrument.

1. INTRODUCTION

Usually, undergraduate nursing curriculum has been primarily based on low reliability simulation in terms of training and development of clinical skills [1]. Though it is widely recognized that simulated learning environments are a safe and effective place to learn clinical skills [2],[3], it is hindered by its inability to correctly echo and prepare students for the complexities of performing clinical activities in an active and unpredictable clinical environment [1]. Advance nursing procedure to be performed by the nursing students in this study includes Heimlich maneuver, Cardiopulmonary resuscitation (CPR), NGT insertion, Urinary Catheter Insertion, and identification of medical instruments. Heimlich maneuver was introduced in 1974 in order to prevent death from food asphyxiation [4],[5], person informed on the procedure can perform the maneuver by not needing any special instrument [5]. The elderly as a vulnerable population are predominantly affected by the Heimlich maneuver [6],[5]. CPR is a lifesaving technique that combines chest compression and artificial ventilation [7], and this procedure has evolve over the last 50 years [8],[9], given to provide sufficient blood perfusion towards major organs including the brain and heart [10]. CPR can be a life-saving procedure performed to a patient in an emergency including cardiac arrest, suffocation, near drowning, electrocution injuries, or any condition in which a victim's respiration or circulation has stopped [11],[12],[13].

Nasogastric tubes are typically used for decompression of the stomach in the setting of intestinal obstruction or ileus, but can also be used to administer nutrition or medication to patients who are unable to tolerate oral intake [14],[15], NGT feeding is an essential way of delivering enteral nutrition when the oral route is insufficient or unsafe [16]. A urinary catheter on the other hand is a tube placed in the body to drain and collect urine from the bladder [17]. Aside from these defined procedure, the students' will also identify medical instruments used in hospital settings. These procedures are taken and practiced both in laboratory and clinical setting before the final return demonstration exam.

2. OBJECTIVES OF THE STUDY

The objective of the study is to find out the nursing student's performance on advance nursing procedures after being exposed in the clinical duty for more than one year, undergone emergency nursing course concurrently, and being one semester away from graduation after the evaluation. *Scope of the study* is the 4th year students final return demonstration exam in INP 3. *Expected result of the study* is to show that the students are competent in advance nursing procedures and fit to work as nurses in the future.

3. MATERIALS AND METHODS

The research employs the use of quantitative with natural experiment research design for analysis of respondent performance in INP exam procedures in CPR, Heimlich maneuver, insertion of catheter and NGT, and identification of instruments which will be referred as advance nursing procedures. Population assessment respondents will be the 4th year students of INP 3 of College of Nursing from Tobruk University. The study used the return demonstration procedure used in their final practical exam. The study aims to find out the nursing student's performance on advance nursing procedures after being exposed in the clinical duty for more than one year, undergone emergency nursing course concurrently, and being one semester away from graduation after the evaluation.

3.1. Study Population

The respondents consisted of 46 nursing students who recently took INP 3 course from 4th year. The whole 4th year class who attended the hospital duty from 2nd semester of school year 2021-2022 and 1st semester of 2022-2023 including taking the final exam was utilized in the study. To determine their current efficacy the study will present their performance in the return demonstration exam. To qualify as respondents the students must be currently in 4th year level and took the INP 3 exam. The sample was then divided into two groups, repeater and regular students for comparison in data measures.

3.2. Research Tools/Instrument

The researcher uses a clinical instructor made procedure currently used as a checklist/evaluation tool for INP 3 which focuses on advance nursing procedures. There are 5 procedure being performed, CPR, Heimlich maneuver, insertion of catheter, inserting NGT, and identification of instruments.

3.3. Data Measures

To permit ease of analysis collected data were tallied and organized into tables. Frequency distribution is used to count the number of respondents on the equivalent rating. Measures of central tendency like weighted mean and standard deviation were used to look for variation in the relative contribution of individual data values to the mean. Independent t-test was used to compare the means of efficacy between two groups, those who took nursing on a regular basis, and those with at least repeated one school year. ANOVA was used to get the difference in the variance when grouped according to rating. Differences between genders were not performed due to limited number of male students over female.

The computed mean were also analyzed with the use of an interpretation with specific mean score ranges and a subsequent adjectival interpretation. Shown below is the interpretation used for the study.

Table 1. Interpretation of student’s efficacy in Advance Nursing Procedures

Range	Adjectival Interpretation
80 – and above	Very Good
70 – 79	Good
60 – 69	Passed
50 – 59	Needs Improvement
Below 50	Poor

3.4. Software Tools

The researchers used Microsoft Excel as a tally sheet and permit the data to be computed using function average for mean, stdev for standard deviation sample size. Talled values also underwent data analysis tool pack to get the difference of mean between INP exam using t-test, and one way ANOVA, with some help from Minitab statistical version 17 to double check statistical results.

4. RESULTS

4.1. Frequency Distribution of Respondents

Table 2. Frequency Distribution of Students Rating in Advance Nursing Procedure

Rating	f	%
Very Good (80 – and above)	5	10.87
Good (70 – 79)	13	28.26
Passed (60 – 69)	15	39.13
Needs Improvement (50 – 59)	8	17.39
Poor (Below 50)	2	4.35
Total	46	100

Table 2 shows that there a total of 46 students who took the final return demonstration for advance nursing procedures. There a 5 who got a Very Good rating, 13 with Good, 15 who Passed, 8 Needs Improvement and 2 who failed with a Poor rating. The data reflected here is only 40% of their final grade, results may differ after adding the other 60% from their class standing marks. Since the purpose of this study is efficacy of students, final exam which is more formal as a performance result was used as data for the study.

4.2. Weighted Mean of Respondents

Table 3 shows the performance of students for every procedure. The students performed well in Identification of surgical instruments with a mean of 78.41 equivalent to adjectival rating of good. It is followed by performing CPR

and Heimlich maneuver with a mean of 74.88 and 71.72 respectively. In general students' Needs improvement rating were seen in NGT insertion and Urinary Catheter insertion with 56.01 and 54.62 score. The overall performance is equivalent to 67.13 or right at the passing mark. The rating shows that the students are competent enough to perform the procedure but might need more practice since the procedures are delicate and might affect care for patients [18]. The students who performed will need more practice to have a better result [18]. The clinical instructor may address students' weak points to get a higher result and prepare them [18] before going for actual hospital duty. Continuous experiences of the student nurses' in a variety of practical learning strategies is proven to be an effective means of acquiring needed skills set to increasing knowledge, skills, attitude and values to become an excellent nurse practitioner [18],[19],[20].

Table 3. Weighted Mean of Students Efficacy in Advance Nursing Procedure

Procedure	WM	SD	Adjectival Rating
Urinary Catheter Insertion	54.62	15.12	Needs Improvement
Heimlich Maneuver	71.72	14.61	Good
Identification of Surgical Instruments	78.41	16.05	Good
NGT Insertion	56.01	18.12	Needs Improvement
CPR	74.88	12.94	Good
Overall Performance	67.13	10.41	Passed

4.3. Differences in Responses

Table 4. Differences in Responses between Repeater and Regular Students

Procedure	Gender	WM	Variance	t-stat	p value
Urinary Catheter Insertion	Repeater	52.00	19.08	-0.71245	0.484414
	Regular	55.88	12.96		
Heimlich Maneuver	Repeater	61.56	10.74	-0.06022	*0.000262
	Regular	76.65	13.77		
Identification of Surgical Instruments	Repeater	70.91	16.08	-2.24825	*0.033261
	Regular	82.03	14.96		
NGT Insertion	Repeater	50.80	21.51	-1.23719	0.22906
	Regular	58.54	16.01		
CPR	Repeater	64.60	10.46	-4.55014	*0.000088
	Regular	79.85	11.05		
Overall Performance	Repeater	59.97	10.4	-3.66132	*0.000669
	Regular	74.15	8.61		

The mean score between the repeater and regular students differ substantially, as the former logs only 59.97 while the latter performed much better with 74.15, with t-stat of -3.66132 and p-value of 0.000669, the observation difference is significant. In terms of performing urinary catheter insertion and NGT, both repeater (52.00 and 50.80) and regular (55.88 and 58.54) students were on the same range although the latter was higher, but there was no significant difference observe with p-value above 0.05 (0.484414 and 0.22906). Significant difference were observe between the mean performance of students in Heimlich maneuver (61.56 and 76.65), Identification of Surgical Instruments (70.91 and 82.03) and CPR (64.60 and 79.85) with p-value of 0.000262, 0.033261 and 0.000088 respectively. The result shows that regular students are better performers not only academically but also in this final exam procedures as well.

Table 5. Differences in Variance Grouped according to Rating

Procedure	Rating	WM	Variation	F-value	p < 0.05
Overall Performance	Very Good	85.32	34.09	120.6489	<0.000001
	Good	73.99	3.90		
	Passed	64.57	6.81		
	Needs Improvement	56.49	9.57		
	Poor	42.57	16.06		

Table 5 shows the difference in variance when grouped according to rating. The students with poor performance tends to have the higher variance compared to higher rated group except for very good rating, the data may have been dispersed due to a higher range group of 80 and above with 20 pts interval (albeit unusual to get a mark over 90 on average) as compared to lower group with only 10 pts interval. With an F-value of 120.6489 and p value of <0.000001, the statistics resulted in a significant difference when grouped according to rating.

5. CONCLUSION

The study presented the result of student evaluation in advance nursing procedure through final return demonstration exam from INP 3. The statistical results shows that the students performed generally well in all procedures with an average score above the passing mark. Significant difference were observe between repeater and regular students in 3 of the 5 procedures (CPR, Heimlich, and instruments). Overall performance shows that regular students are more competent than repeating students with a p-value of 0.000669 and a mean of 74.15 for regular students and 59.97 for repeaters. The variance proved to be significantly different based on ANOVA when the students are grouped according to rating as expected. Overall the study proved that students were competent enough to perform advance nursing procedure and may well be fit to work as nurses in the future, albeit with a bit more exposure. The collected data can be used to improve quality of nursing education by enhancing student's weak points through proper and extensive training in the area of advance nursing procedure, especially in performing catheter and NGT insertions and complementing their strong area [18],[20]. As clinical research suggests that even nursing graduates have difficulty in maintaining indwelling urinary catheter or IDC insertion

procedural requirements [1],[21]. This is suggested to come from the didactic clinical skills training commonly provided, which fosters surface knowledge regarding aspects of the procedure [1],[21]. While clinical simulation is proven to be an effective teaching method for developing clinical skills, it does not however provide students with a humanistic approach or the ability to accomplish the dynamics of a clinical scenario that they may bump into in the clinical setting [1].

The researchers recommend further study to address factors that may affect the result [18],[20],[22]. More respondents and including other School year level and nursing procedures from both lower and succeeding semester of INP be integrated in the study for comparison would press on the result. It is suggested that the faculty members ensure adequate training and proper education in INP subjects with intensive training approach by the clinical instructors and hospital staff nurses assigned to students in INP courses to ensure quality nursing education and quality nursing care on patients [18]. Furthermore, appropriate educational methods should be considered to reinforce the acquired knowledge and performance and avert them from being overlooked over time [23]. Based on the findings and conclusion, the College of Nursing of Tobruk University should enhance the INP curriculum for the students to improve their skills [18],[20],[24]. It is also recommended to the University administration to address the lack of clinical instructor assigned in INP by hiring more personnel with high qualification. In addition, the College of Nursing should have virtual laboratory for the students with laboratory equipment, supplies and models to enhance the skills of the students [18],[20],[24]. The University should put up library with learning/teaching materials like nursing books [18],[24], internet connection and nursing journals [18].

Declarations

Source of Funding

This research did not receive any grant from funding agencies in the public, commercial, or not-for-profit sectors.

Competing Interests

The authors declare no competing financial, professional and personal interests.

Consent for publication

We declare that we consented for the publication of this research work.

Availability of data and material

Authors are willing to share data and material according to the relevant needs.

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