An-Najah National University Faculty of Graduate Studies

Evaluation of Nurses' Knowledge and Understanding of Obstacles Encountered When Administering Resuscitation Medications: A Cross-Sectional Study from Palestine

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iii Dedication

الى احب انسانة على قلبي التي علمتني معنى التضحية والإخلاص، التي افنت حياتها في سبيل تحقيق احلامنا وكانت الداعم الدائم لي في كل مرحلة من حياتي امي الحبيبة

الى الرجل الاعظم في حياتي الذي سعى دائما لأجل رلحتي ونجاحي وعلمني معنى الصبر وأهمية العلم ... ابي الغالي الى عمي الغالي احمد غطاس الى من ظفرت بهم هدية من الاقدار مندي وعزوتي اخوتي الاحباء الى مندقي ورفيقة حزني وفرحي اختي الحبيبة الى صديقتي ورفيق دربي زوجي العزيز الى سندي ورفيق دربي زوجي العزيز الى ابنتي الغالية ... زينة الى ابنتي الغالية ... زينة الى صديقاتي اللواتي شاركنني رحلة الحياة الى أساتنتي الأفاضل الذين اضاؤوا بعلمهم عقولنا الى كل من ساهم في انجاز هذا العمل

Acknowledgment

الحمد لله رب العالمين حمداً كثيراً طيباً مباركاً فيه أن منّ علي من خيره الكثير وأنعم علي من فضله في العلم وأعانني على انجاز هذا العمل.

اتقدم بخالص الشكر والامتنان الى اساتذتي الافاضل في كلية الصيدلة جامعة النجاح الوطنية.

واخص بالذكر مشرفي الدكتور سائد زيود واشكره جزيل الشكر على مجهوده وتحفيزه و كل ما قدمه لي من علم قيم.

والدكتورة سماح الجابي على دعمها ومساهمتها في نجاح هذه الاطروحة.

وأود ان أتوجه بالشكر لوزارة الصحة الفلسطينية لتسهيلها عملية جمع المعلومات اللازمة لهذه الاطروحة.

واتقدم بخالص الامتنان لكادر التمريض الذي منحني من وقته الثمين لإتمام هذه الاطروحة.

ولكل من مد لى يد العون وساهم في انجاز هذا العمل له منى كل الشكر والتقدير.

الاقرار

أنا الموقعة أدناه، مقدّمة الرسالة التي تحمل العنوان:

Evaluation of Nurses' Knowledge and Understanding of Obstacles **Encountered when Administering Resuscitation Medications:** A Cross-Sectional Study from Palestine

أقر بأن ما اشتملت عليه هذه الأطروحة إنما هو نتاج جهدي الخاص، باستثناء ما تمت الاشارة إليه حيثما ورد. وأن هذه الرسالة كاملة، أو اي جزء منها لم يقدم من قبل لنيل اي درجة او لقب علمي او بحثى لدى أي مؤسسة تعليمية أو بحثية أخرى.

Declaration

The work provided in this thesis, unless otherwise referenced, is the researcher's own work, and has not been submitted elsewhere for any other degree or qualification.

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List of Abbreviations

Amp	Ampoule
BS	Bachelor Degree
Ca	Calcium
CaCl2	Calcium Chloride
CCU	Cardiac/Coronary Care Unit
CPR	Cardiopulmonary Resuscitation
ER	Emergency Room
ICU	Intensive Care Unit
IRB	Institutional Review Boards
IV	Intravenous
KCl	Potassium Chloride
ME	Medication Error
MS	Master Degree
MW	Medical Word
NaHCo3	Sodium Bicarbonate
NICU	Neonatal Intensive Care Unit
NTI	Narrow Therapeutic Index
SD	Standard Deviation
SPSS	Statistical Package for Social Sciences

Evaluation of Nurses' Knowledge and Understanding of Obstacles Encountered When Administering Resuscitation Medications: A Cross-Sectional Study from Palestine

By Rawan Issam Qedan Supervisors Dr. Sa'ed H. Zyoud Dr. Samah W Al-Jabi Abstract

Background: medication errors one of most important reason of patients' morbidity and mortality, insufficient knowledge of drug among nurses considered a major factor in drug administration errors also stressful and complex systems in resuscitation increase errors. increase nurses' knowledge about resuscitation medications is important to maximize patient safety. This study aimed to assess knowledge of nurses about resuscitation medications and the obstacles that nurses faces when giving resuscitation medications, and to evaluate resuscitation medication administration errors reporting and the reason that prevent nurses to not reporting the errors.

Methods: a cross sectional study was conducted, in west bank, Palestine. convenient sampling was used to collect sample, data were collected via a face to face interview questionnaire, which was taken from a previous study. The questionnaire consisted of five parts: demographic data, knowledge of resuscitation medications(20 true - false questions), selfevaluation, causes of not reporting the medication errors, and suggestions to decrease medication errors. **Results**: a total of 200 nurses were participated in the study. Nurses were found to have insufficient knowledge about resuscitation medications; the correct response rate was only 58.6%. More knowledge score was associated with male nurses (P = 0.001), nurses working in CCU, ICU, and general with P value < 0.001, and who in supervisor position (P = 0.035). The major obstacle nurses faced when administering resuscitation medication was chaotic environment in CPR as a lot of people handling a single drug(62%), unavailability of pharmacists whole the day (61%), and different medications look alike in packaging (61%) were other obstacles. Most of nurses (70.5%) hoped to gain additional training. In our study we found that nursing management focused on the person rather than the system (71.5%), and If anything happens to the patient, nurses thought they would be blamed as a consequence of the ME (71.5%) were the major causes behind not reporting Medication Administration Errors.

Conclusion: nurses Insufficient knowledge regarding resuscitation medications was one of the obstacles they faced, nurses favoured to collaborate with pharmacist should arranges medications in a good way, and having continuous learning and extra training about resuscitation medications to decrease medication errors.

Chapter one Introduction

1.1 Background

1.1.1 Medication errors (MEs)

One of the most important reasons for patient morbidity and mortality is MEs (Wittich et al., 2014); furthermore, it is thought to be the most important cause of death among adults (Holden and Karsh, 2007).

MEs are a dangerous problem during treatment, especially for patients in intensive care units(ICUs) who can suffer very serious complications due to their severe illnesses and the complex pharmacotherapy programmes they receive (Escriva Gracia et al., 2019).

Any errors in the dose, administration rate, concentration of drug, type of drug, route of administration, method of administration, or delay in administration, fall under the definition of "MEs" (Gladstone, 1995). Research has found that there can be important errors during the preparation and administration of medications (Gladstone, 1995, Kuitunen et al., 2020, Murugan et al., 2019).

There are many causes for MEs, and many research studies have focused on these reasons; their findings include stressful and complex systems, workload, poor skill, distracting nurses during their work, a lack of concentration, and insufficient knowledge of the drug and calculation tasks, confusion between look-alike and sound-alike medications, using medications with a narrow therapeutic index (NTI), and an insufficient number of years' experience in nurses work (Gladstone, 1995, Kuitunen et al., 2020, Wu et al., 2002, Mortaro et al., 2019, Santomauro et al., 2018, Dugan et al., 1996, Phillips et al., 2001). In addition, other research has found that serious incidents occur due to problems related to team working and knowledge related to cardiac arrest in special cases (Andersen et al., 2010a).

1.1.2 Resuscitation procedure

Resuscitation is a multipart process executed in a short time, frequently happening in uncontrolled situations; a stressful situation that requires nurses with high knowledge, and where, with limited information and time nurses, should respond as fast as possible. In such conditions, the performance of nurses may not be satisfactory enough, particularly when nurses are not enough qualified or experienced in responding to stressful conditions (Andersen et al., 2010a, Kozer et al., 2004). The numbers of errors are increased in situations of stress and hurried actions (Nolan, 2000), and the confusion of the resuscitation environment can generate errors in the critical stages of administering medications (Flannery and Parli, 2016).

1.1.3 The role of nurses in MEs

Patient safety is the responsibility of nurses, however, many tasks performed by nurses involve a percentage of risk to patient safety, and medication administration perhaps causes the greatest risk, making it a significant and critical task (Elliott and Liu, 2010, Pham et al., 2011). Nurses lacking knowledge of drugs and their appropriate doses can cause medication errors to occur (Escriva Gracia et al., 2019, Guerrero-Marquez et al., 2016), especially with increased stress and interruptions during medication administration among nurses (Dugan et al., 1996, Raja et al., 2019). The resuscitation procedure requires a rapid response by nurses to the doctor's oral orders without enough time to get reference information on administering a resuscitation medication (Chen et al., 2014).

1.1.4 How to decrease MEs

There is a lot that can be done to decrease MEs. Research suggests some interventions that can decrease the odds of MEs, such as changes in work schedules, modes of education, medication reconciliation, protocols and guidelines, and also computerised physician order entry, intravenous systems, pharmacist participation and support systems for clinical decision-making (Manias et al., 2012).

Using information technology in hospitals can also decrease MEs, such as bar-code technology (Bates et al., 2001), and computerised physician order entry, which can detect contraindications and any errors in doses and orders (Bates et al., 1998, Chen et al., 2014), therefore providing benefits especially for administration of (NTI) drugs (Durieux et al., 2008).

Other research suggested improving calculation skills of nurses (Grandell-Niemi et al., 2003, Wright, 2007), reducing the frequency of interruptions during drug administration (Santomauro et al., 2018), and increasing nurse's knowledge about resuscitation medications, eliminating visual confusion of drugs as much as possible to avoid confusion (Chen et al., 2014). Moreover, providing clinical education under sufficient supervision (Musharyanti et al., 2019), has been suggested to continue education to improve pharmacological knowledge and update their knowledge and training about the preparation and administration of paediatric medications, especially in the emergency department. Additionally, training nurses about mathematical skills could improve patient safety and is especially recommended when using specialised equipment. Giving nurses personal responsibility (Murugan et al., 2019, Zyoud et al., 2019, Chardalias et al., 2017, Gladstone, 1995, Di Simone et al., 2018) and appreciation to build confidence, as well as psychological support for nurses who make a drug error is essential (Gladstone, 1995). In special cases, to decrease resuscitation system errors, research has suggested the training of code team personnel (Ornato et al., 2012), and the presence of a clinical pharmacist to review drug orders can decrease errors in medication orders (Folli et al., 1987).

Nurses have stated that during resuscitation procedures, they must respond directly to orders without having enough time to find information from references, therefore, it is vital to increase their pharmacological knowledge, especially about resuscitation medications, and to improve communication within the team to improve patients safety (Chen et al., 2014, Kozer et al., 2004). Furthermore, incident reporting is widely known as an important factor in decreasing MEs (Dhamanti et al., 2019). It has been noted that reporting adverse events voluntarily and in private is the best situation to do this, and is more reliable than mandatory reporting (Wu et al., 2002). It is important to report MEs when they occur, to learn from them and to prevent the reason behind their occurrence (GLEESON ET AL., 2019, DYAB ET AL., 2018).

1.2 Problem statement

MEs are increasing in number, but studies related to the issue are few in number, especially in Middle Eastern countries and do not contain sufficient information (Alsulami et al., 2013). Moreover, previous research worldwide has produced few studies about nurses' knowledge of resuscitation medications and the obstacles they face during medication administration. This study is considered to be the first in Palestine.

To decrease morbidity and mortality among patients due to MEs (Wittich et al., 2014), it is necessary to evaluate nurses' pharmacological knowledge and to understand the obstacles they face when administering resuscitation medications. Nursing associations can then argue for mandatory training courses about administering resuscitation medications and to decrease the obstacles they encounter in order to minimise resuscitation MEs as much as possible. This research will help university academics design multidisciplinary courses in clinical pharmacology focus on resuscitation

medication as part of ongoing nurse education that meets Palestinian nursing practice situations.

1.3 Objectives

The study objectives were:

- to assess knowledge of nurse about resuscitation medications,
- to determine the obstacles that nurses meet when giving resuscitation medications,
- to evaluate resuscitation medication administration errors in reporting and the reason that prevent nurses not to report the errors,
- to determine factors that affect sufficient knowledge among nurses.

1.4 Significance of the study

This study will be first one in the field of nursing in Palestine that concerns nurses' knowledge and obstacles they face when giving resuscitation medications. It will establish a database for future studies in different professions in the medical field, and the results of this study will assist health care providers and health policymakers to create mechanisms to decrease medication errors and establish clear protocols to increase patients' safety as possible and improve health care in Palestinian hospitals.

Many factors and obstacles could be behind the reasons resuscitation medication administration errors, such as excess work, poor skills, distraction while working, deficient concentration and inadequate knowledge of nurses under tension and shortness of time in these situations (Gladstone, 1995). The chance of survival for victims of cardiopulmonary arrest can be maximised by increasing knowledge about resuscitation medications (Kozer et al., 2004).

Therefore, an evaluation of nurses' knowledge is necessary to measure the degree of lack of information about resuscitation medications and to recognise the obstacles they face during medication administration. This will enable future activities and strategies to decrease the MEs in a significant way and to decrease deaths.

Chapter Two Literature Review

Literature Review

Several studies have covered general MEs worldwide and high-alert medication and resuscitation MEs specifically.

Anderson et al. analysed and categorised cardiac arrest incidents that were reported to the Patient Safety Database in Denmark (Andersen et al., 2010b). They analysed 107 reports which described 122 incidents classified as: alerting the resuscitation team (26%), poor human performance (18%), equipment failure (16%), inadequate resuscitation equipment (11%), physical environment (11%), deficient monitoring (11%) and MEs (7%). When they analysed MEs, the following reasons were identified: an incorrect dose of adrenaline (n = 1), the wrong drug (atropine) was used instead of adrenaline during resuscitation (n = 1), and an incorrect dose of adrenaline (n = 1) and amiodarone was prepared in too high a concentration (n = 1). There were three cases of cardiac or respiratory arrest caused by infusion of intravenous potassium, acetylcysteine and a combination of drugs, and 11 incidents due to poor human performance, poor communication, or unclear team leadership and roles. It was identified that these incidents occurred because of disorganised situations, with several persons talking at the same time, the issuing of unclear or conflicting information, and an insufficient understanding about equipment and guidelines: therefore, recommendations were made to rearrange education and implementation of resuscitation practices.

In the United States, because incidents occur regularly, Ornato et al. have evaluated 118,387 adult cases in a cardiac arrest hospital (Ornato et al., 2012), where 28.7% of these cases were recorded with one or more system errors. With regard to resuscitation errors, 42.5% were MEs due to a delay in vasopressor (epinephrine or vasopressin) administration >5 min from event detection, caused by the wrong route of administration (0.2%), wrong dosage given (0.5%) and choice of wrong drug (1.0%). Where resuscitation errors occurred, it was often due to errors by code team put down to leadership errors, a lack of knowledge of medications/protocols (0.5%), and equipment (0.1%), an overcrowded resuscitation room (0.1%) and others causes, leading to recommendations for retraining of the code team on resuscitation procedures.

In Taiwan, Sheu et al. published research in which they described the types of errors that occurred, with the backgrounds of the hospital and nurses, patient consequences, mechanisms of discovering the errors and rates of reporting errors; they collected the data by using a snowball method of sampling (Sheu et al., 2009). In this study, 85 nurses participated and they collected 328 administration errors from teaching and local hospitals, with errors mostly happening in medical and surgical departments in education hospitals through the day shift, and by nurses with low working experience of fewer than two years. In total, 259 (79.0%) of administration errors affected patients (actual errors) and 69 (21.0%) were near misses.

More than 60% of actual errors were due to the wrong dose or drug (33.2%, 86/259; 31.3%, 81/259, respectively); the wrong time of administration (12.4%, 32/259), wrong patient (11.6%. 30/259), wrong route of administration (8.5%, 22/259) and "other" (3.1%, 8/259). According to ME reporting, nurses reported 62.5% (162/259) of actual errors and 50.7% (35/69) of near misses. Errors were reported mostly to the head nurse and the rest to supervisors. Few errors were reported to the medical department (35.9%, 93/259 vs. 18.8%, 13/69) and pharmacy (0.0%, 0/259 vs. 8.7%, 6/69); furthermore, only a small number of actual errors were reported to patients and families (3.5%, 9/259) and none (0/69) of near misses. In the actual errors, three medicines, insulin (15%), potassium chloride (KCl) and pitocin were considered as high alert medications.

Fifteen cases of insulin using caused hypoglycaemia and resulted in one death, two comas and one transfer to ICU. Four cases of 15% KCl infusion, three cases were given as an IV push, and the other was used in the wrong intravenous (IV) pump set, which caused two patient deaths and two to required Cardiopulmonary resuscitation (CPR). There were also wrong injections of four cases of oxytocin, but these cases were treated successfully without any harm to the patients. In the recommendations to decrease administration errors, it was suggested that nurses should be more

careful when giving high alert medications, and hospitals must use a snowball-sampling method to collect details of errors from nurses, establish standard operating procedures for identified high-alert situations, and support nurses to report any errors.

In Taiwan in 2006, Hsaio et al. have developed and validated an instrument to assess nurses' knowledge about high alert medications and analyse administration errors discovered by assay, which used a cross section method (Hsaio et al., 2010). There were 305 nurses in the study, and the response rate was 79.2% (305/385). The rate of correct answers for the evaluation of nurses' knowledge of high-alert medications was 56.5%, and working experience was taken into account. Just 3.6% of nurses, in their own opinion, considered themselves to have adequate knowledge about high-alert medications; 84.6% agreed to undergo further training and insufficient knowledge was the most important obstacle reported. A total of 184 administration errors were documented and were mostly the wrong type of drug used and incorrect doses; but only 4.9% of these errors caused severe complications. The study noted that nurses had inadequate knowledge about medications, and it was necessary to increase education, especially concentrating on intravenous push administration of high alert medications.

Lu et al. have explored if educational involvement affected nurses' knowledge regarding the administration of high-alert medications (Lu et al., 2013). The participants in the study were 232 nurses (female, 99.1%),

with an average age of 29.4 ± 0.6 years and 7.0 ± 6.0 years worked. About 70% were educated to a bachelor's (BS) or master's (MS) degree level, and 74.1% had no training in high-alert medications. Before the educational intervention, the correct answer rate was 75.8%, but the intervention group notably improved its correct answer rate (from 77.2% to 94.7%); however, the control group did not (from 74.3% to 75.5%). More working years, experience working in paediatrics and ICU, and training in emergency room (ER), ICU and high-alert medications made an important statistical impact on their scores. It was found that attractive and effective methods of teaching, such as using PowerPoint, was best to use for hospital-based continuing education. The study recommended that pharmacology education was fundamental and was a powerful strategy to reduce drug administration errors among nurses.

In Taiwan, Chen et al. (Chen et al., 2014) published a study that evaluated nurses' knowledge and understanding of the obstacles that they encountered during resuscitation medication administration. Using a cross-sectional method in their study, they developed a questionnaire that consisted of 20 true/false questions from literature and was validated by subject experts and one pilot study in order to assess nurses' knowledge of resuscitation medications. The participants were 188 nurses, and generally the correct answer rate was 70.5%, which increased with work experience, age, working years and working department. CPR training made an important statistical impact on their scores on the questionnaire. Nurses who worked in the ER or ICU department had a superior score than those who worked

in the medical–surgical wards and obstetric-paediatric wards. In the nurses' opinion, just 8% of them thought that they had sufficient knowledge, and 73.9% hoped to get more training about resuscitation medications. Interruption during the administration of the drug during the resuscitation process was the leading obstacle reported (62.8%). Sixteen resuscitation MEs were documented by the nurses in this study; the errors were using atropine (five cases), epinephrine (three cases) and "others". The causes of the errors were the misunderstanding of orders, inadequate knowledge and confusing certain drugs for other look-alike drugs. The study recommended taking appropriate measures to develop performance and CPR skills and use a developed teaching tool to enhance nurses' knowledge and finally, to make the CPR environment calm and without any interruption.

Further studies are needed to validate the instrument and evaluate nurses' knowledge level of resuscitation medications. In Palestine, a study with a cross-section method was done in 2015 by Zyoud et al. (Zyoud et al., 2019). They collected data by face to face interview questionnaire, which was taken from an earlier study (Hsaio et al., 2010). The participants were 280 nurses (93% response rate) who were working in the ER, ICU, paediatric or medical ward (MW). They found that the nurses had insufficient information about high alert medications because 67.1% had a score of less than 70%.

The factors that affected the nurses' knowledge with significant difference were high alert medication training and ICU training, nurses having a higher educational level, those working in the ICU department, head nurses, and being a male nurse. Most of the nurses (about 81.8%) hoped to gain additional training. There were conflicting opinions between doctors and nurses as to the leading obstacle reported; nurses reported that there was no established standard operating procedure for high alert medications, and they recommended increasing training courses for nurses to improve their pharmacology knowledge and for continuing education.

Chapter Three Methodology

3.1 Study design

We used a cross-section method in our study, which was conducted to evaluate nurses' knowledge and understanding of the obstacles they face when giving resuscitation medications.

3.2 Study setting

Palestine consists of two zones: the West Bank and the Gaza Strip, with a total population of about five million inhabitants. Nearly 60.2% live in the West Bank and 39.8% live in the Gaza Strip. The West Bank is divided into three regions and 11 governorates. The north area comprises: Jenin, Tulkarm, Nablus, Qalqilya, Tubas; the middle area comprises: Jerusalem, Ramallah, Salfit and Jericho; the south area comprises: Bethlehem and Hebron (PHIC, 2018).

This study was conducted in the north district of the West Bank of Palestine, where a list of the hospitals and their addresses was acquired from the Ministry of Health. Based on the lists, the study was held in the following governmental hospitals in the north of the West Bank: Nablus, Jenin, Tulkarm, Qalqilya and Tubas.

3.3 Study population

The population was chosen from nurses that worked in governmental hospitals in the north of West Bank. There are 4362 registered nurses working in governmental health care units in Palestine. There are seven universities in the West Bank from which nurses with different specialities graduate(PHIC, 2018).

3.4 Sampling procedure and sample size calculation

This study used convenience samples of nurses from Government hospitals in the north district of the West Bank of Palestine. The Palestinian Health Information Centre data found that 1566 nurses were working in the governmental hospitals in the West Bank of Palestine (Ministry of Health and Palestinian Health Information Center (PHIC), 2015). Generally, we assumed that about 400 nurses who worked in the hospitals would be incorporated in the current study. We calculated the sample size for our study by using the Raosoft sample size calculator (<u>http://www.raosoft.com/samplesize.html</u>), the sample size was 200 nurses, to achieve a confidence level of 95% and a margin of error of 5%.

3.5. Inclusion and exclusion criteria

The inclusion criteria were nurses with Palestinian nationality and licensed by the Palestinian ministry of health; having at least diploma

qualifications, or higher degree; and were working in ER, ICU, MW, paediatric departments or other.

The Exclusion criteria were nurses who refused to participate in the study, nursing school students, and those who worked in private or teaching hospitals.

3.6. Instruments and data collection form

The Questionnaire used consisted of five parts, which had been developed by a previous study (Chen et al., 2014) (Appendix 1). The prepared questionnaire consisted of both open-ended and closed questions. The questionnaire contained five parts and all parts were translated to Arabic language:

- The first part was about the demographic data, which contained questions regarding age, gender, the region of residence, marital status, educational level, position, working experience in years, CPR experience and training that may affect knowledge of resuscitation medications.
- We evaluated nurses' knowledge of resuscitation medications in the second section, which consisted of 20 questions which had been developed by Chen et al. study (Chen et al., 2014)The degree of knowledge about resuscitation medications was determined according to the nurse's score. From the choices of true/false/I don't know, we

calculated the correct answer rate on the knowledge of pharmacology and analysed demographic data effects on knowledge score.

- The third section was designed for self-evaluation by nurses for the following three factors concerning resuscitation medications:
- Obstacles they faced and reasons for why medication administration errors happened, by indicating their level of agreement using a five points Likert type scale with fixed values ranging from 5 = "strongly agree" to 1 = "strongly disagree" for 20 items which had been developed by Chen et al(Chen et al., 2014)
- The degree of their Knowledge level (five levels to choose from "sufficient" to "extremely insufficient.")
- Their need for training (three choices: "need", "no comment" and "no need.")
- The fourth section included 15 items to find out the causes behind not reporting MEs which developed by several studies (Dyab et al., 2018, Naome et al., 2020, Mansouri et al., 2019)Nurses were asked to indicate their level of agreement by using a five points Likert type scale with fixed values ranging from 5 = "strongly agree" to 1 = "strongly disagree".
- The fifth part consisted of 5 items concerning suggestions to decrease MEs. Nurses were asked to choose their level of agreement using a five points Likert type scale with fixed values ranging from 5 = "strongly agree" to 1 = "strongly disagree".

3.7. Ethical approval

All aspects of the study protocol, including access to and use of the nurse clinical information, was approved by An-Najah National University Institutional Review Boards (IRB) and the local health authorities before initiation of this study. Verbal consent was obtained from nurses.

3.8. Pilot study

A pilot study (25 participants) was conducted to test the tool, ensuring the availability of the required data, to estimate the time required and to modify the data collection form as appropriate. The nurses participating in the pilot study were included in the final analysis because the survey has not been modified.

3.9. Statistical analysis

Data were entered and analysed using the Statistical Package for Social Sciences programme version 15 (SPSS). We expressed the data as means \pm standard deviation (SD) for continuous variables and as frequencies (percentages) for categorical variables. Not normally distributed variables were expressed as medians (lower-upper quartiles). Variables were tested for normality using the Kolmogorov–Smirnov test. Either the chi-square or the Fisher exact test were used to test significance between categorical variables as appropriate. We used the Kruskal–Wallis test followed by Bonferroni–Dunn post hoc analysis or Mann–Whitney U-test to test for differences in the means between categories. The significance level will set at p <0.05.

Chapter Four Results

4.1. Sociodemographic data

This study was health care hospital-based with a cross-section method, which was carried out with 200 nurses who worked in governmental hospitals in the north of West Bank of Palestine.

As Table 1 indicates, half of the participants (about 51.5%) were females. The majority of them (82%) were younger than 40 years old, and most of the participants were married (81.5%). The distribution of participants was almost equal from the governmental hospitals of Rafedia (17.5%), Al-Watany (16.5%), Jenin (13.5%), Tubas (10.5%), Tulkarm (22.5%) and Qalqelia (19.5%), and they worked in many departments; ER (17.5%), ICU and neonatal intensive care unit (NICU) (24%), MW (34.5%), paediatric (16.5%), with the remaining (7.5%) working in CCU, Gynae' and General.

Table 1 shows that most of the participants were staff nurses (92.5%), with their place of residence given as Tulkarm (23.5%), Nablus (33.5%), Jenin (18.5%), Qalqelia (20.0%) and Tubas (4.5%). About 75% of them had 5 years' experience and more, and in terms of the educational level, most of them (about 64.5%) had BS level, 25.5% had diploma degree and 10% had a master's degree. Moreover, most of the participants had CPR training.

Variable	Frequency (%)		
Cender	1N = 200		
Male	97 (48 5)		
Female	103 (51 5)		
Age category	105 (51.5)		
Years			
20–29	72 (36.0)		
30–39	93 (46.5)		
40-49	28 (14.0)		
50–59	7 (3.5)		
Marital status			
(single, divorced, widow)	37 (18.5)		
married	163 (81.5)		
Hospital			
Rafedia	35 (17.5)		
Al-watany	33 (16.5)		
Jenin	27 (13.5)		
Tubas	21 (10.5)		
Tulkarm	45 (22.5)		
Qalqelia	39 (19.5)		
Department			
ER	35 (17.5)		
ICU	27 (13.5)		
N.ICU	21 (10.5)		
Paediatric	33 (16.5)		
Men.M.W	41 (20.5)		
Women.M.W	28 (14.0)		
CCU	7 (3.5)		
Gynae ward	4 (2.0)		
General	4 (2.0)		
Position			
Staff nurse	185 (92.5)		
Head nurse	11 (5.5)		
Supervisor	4 (2.0)		
Residency			
Tulkarm	47 (23.5)		
Nablus	67 (33.5)		
Jenin	37 (18.5)		
Qalqelia	40 (20.0)		
Tubas	9 (4.5)		
Years of working			
Less than 5 years	49 (24.5)		
5 to less than 10	71 (35.5)		
10 years or more	80 (40.0)		
Educational status	51 (25.5)		
Diploma	51 (25.5)		
DS MS	20 (10 0)		
	20 (10.0)		
	175 (87 5)		
No	25 (12 5)		
140	25 (12.5)		

Table 4-1. Socio-demographic characteristics of the study sample.

ER: emergency room, ICU: intensive care unit, NICU: neonatal intensive care unit, MW: medical word, CCU: cardiac/coronary care unit, BS: bachelor degree, MS: master degree.

4.2. Resuscitation medications administration knowledge

We asked nurses about the proper administration of resuscitation medications, and the correct response rate was 58.6%; 28.2% were incorrect answers, and 13.2% answered "don't know". We found that the question number 11, about using atropine in treating pulseless electrical activity received the lowest correct response rate: only 36.5% answered correctly. In contrast, the highest correct response rate was 87.5%, agreeing that KCl is not given as fast IV push in an emergency event such as ventricular fibrillation. More than half of nurses did not understand that when they calculated the epinephrine (adrenaline) dosage for children, they must use bodyweight and not body surface area (correct rate 44.5%). In addition, most nurses thought that drugs should be available in multiple concentrations to choose, although this is unacceptable (correct rate 41.5%).

Questions	Answer	Correct answer	Incorrect	Don't know the
		n (%)	answer	answer
			n (%)	n (%)
1. 10 mls fast IV push	F	175 (87.5)	13 (6.5)	12 (6.0)
of 15% KCl is given in				
an emergency cases for				
example ventricular				
fibrillation case.				
2. In the cardiac arrest	Т	138 (69)	46 (23.0)	16 (8.0)
case we give rapid IV				
push 1 mg epinephrine				
within 3–5 minutes.				
3. We favoured small	F	139 (69.5)	37 (18.5)	24 (12.0)
venous vessels in case				
of dopamine injection.				
4.To preserve	Т	107 (53.5)	64 (32.0)	29 (14.5)
norepinephrine				
bitartrate effect we add				
glucose water to it.				

 Table 4-2. Resuscitation medications administration knowledge.

		23		
5. We inject NaHCO ₃ with epinephrine to cause an additive effect of the drug.	F	115 (57.5)	32 (16)	53 (26.5)
6. To avoid hypoglycaemia occurrence, glucose water should constantly be given when starting CPR procedure.	F	112 (56.0)	64 (32.0)	24 (12.0)
7. We can interchange between 10% Ca glucose and 10% CaCl ₂ because they are the same drug.	F	136 (68.0)	20 (10.0)	44 (22.0)
8. Amiodarone is used to treat bradycardia.	F	138 (69.0)	43 (21.0)	19 (9.5)
9. Nitroglycerine is used to treat cardiac infarction, which is accompanied by a drop in blood pressure and bradycardia.	F	133 (66.5)	50 (25.0)	17 (8.5)
10. 1 amp of 1:1000 epinephrine is given as fast IV push in case of a mild allergic reaction.	F	110 (55.0)	64 (32.0)	26 (13.0)
11. In the case of pulseless electrical activity, atropine is used within the treatment.	F	73 (36.5)	112 (56.0)	15 (7.5)
12. Atracurium should be stored with other drugs and easily accessed by nurses.	F	114 (57.0)	64 (32.0)	22 (11.0)
13. If we give the drugs endotracheally, the dosage should be increased 5 to 10 times than IV dose.	F	103 (51.5)	48 (24.0)	49 (24.5)
14. To avoid bradycardia, give a small dose of atropine (< 0.5 mg) in case of CPR.	F	101 (50.0)	77 (38.5)	22 (11.0)
15. Adenosine is given for bradycardia as slow IV drip (> 10 minutes).	F	130 (65.0)	54 (27.0)	16 (8.0)
16. The first choice of treatment in case of ventricular tachycardia or fibrillation is lidocaine.	F	119 (59.5)	56 (28.0)	25 (12.5)

		24		
17. Rapid IV push 10% CaCl ₂ 10 ml over $1-$ 2 minutes is given in the emergency cases.	F	93 (46.5)	70 (35.0)	37 (18.5)
18. Various concentrations of all drugs should be available to choose by nurses.	F	83 (41.5)	102 (51.0)	15 (7.5)
19. Epinephrine dose calculation is based on body surface area in paediatric CPR.	F	89 (44.5)	89 (44.5)	22 (11.0)
20. Amiodarone is best given endotracheally, to increase its effect.	F	137 (68.5)	25 (12.5)	38 (19.0)
Mean		58.6	28.2	13.2

IV: intravenous, KCl: potassium chloride, NaHCo3: sodium bicarbonate, CPR: Cardiopulmonary resuscitation, Ca: calcium, CaCl2: calcium chloride, Amp: ampoule.

4.3. knowledge score and sociodemographic variables

The knowledge scale consisted of 20 questions to measure knowledge among nurses about resuscitation medications; these questions are shown in Table 3.

Table 4-3. Knowledge questions.

1.	10 mls fast IV push of 15% KCl is given in emergency cases, for example,
	ventricular fibrillation case.
2.	In the case of cardiac arrest, we give a rapid IV push of 1 mg epinephrine
	within 3–5 minutes.
3.	We favoured small venous vessels in case of dopamine injection.
4.	To preserve norepinephrine bitartrate's effect, we add glucose water to it.
5.	We inject NaHCO ₃ with epinephrine to cause an additive effect of the drug.
6.	To avoid hypoglycaemia occurrence, glucose water should constantly be
	given when starting the CPR procedure.
7.	We can interchange between 10% Ca glucose and 10% CaCl ₂ because they
	are the same drug.
8.	Amiodarone is used to treat bradycardia.
9.	Nitroglycerine is used to treat cardiac infarction, which is accompanied by a
	drop in blood pressure and bradycardia.
10	0. 1 amp of 1:1000 epinephrine is given as a fast IV push in case of a mild
	allergic reaction.
11	. In the case of pulseless electrical activity, atropine is used within the
	treatment.
IV: intravenous, KCl: potassium chloride, NaHCo3: sodium bicarbonate, CPR: Cardiopulmonary resuscitation, Ca: calcium, CaCl2: calcium chloride, Amp: ampoule.

As shown in Table 4, the median of knowledge score for male participants was high (13; quartile range 10–16) compared with females. The median for age category, 20–29 years was 12.5 (9–16), 30–39 years was 12 (8–15), 40–49 years was 11 (8.25–14.75), and 50–59 years was 13 (9–15) respectively. Participants who married had median knowledge score 12 (9–15), and in single, divorced, widowed nurses was 13 (8.5–15). A high median knowledge score was observed in nurses that worked in general wards 17.5 (14.75–18.75), and that worked in the CCU department (16; 15–17), also whose position was a supervisor 17.5 (14.75–18.75). Moreover, participants' years of working showed the same median knowledge score, 14 (9.25–15.75), and also those who had CPR training showed a higher knowledge score, 13 (9–15).

Table 4 shows a significant difference between nurses according to gender and knowledge score. A high knowledge score was associated with males (P = 0.001), and also shows a significant difference according to which department they worked, with a high knowledge score associated with CCU, ICU, and general (P < 0.001); moreover, there was a significant difference between nurses according to position and knowledge score. A high knowledge score was associated with being a supervisor (P = 0.035). No significant differences were noted between nurses according to age, marital status, hospital, residency, years of working, educational status and CPR training.

Variable	Frequency	Median k	Mean rank	P- value
Condon	(70)	(Q1-Q3)		
Gender				
Male	97 (48.5)	13 (10–16)	114.59	0.001^{a}
Female	103 (51.5)	10 (8–14)	87.23	
Age category (Years)				
20–29	72 (36.0)	12.5 (9–16)	106.58	
30–39	93 (46.5)	12 (8–15)	98.77	
40–49	28 (14.0)	11 (8.25–14.75)	91.45	0.661 ^b
50–59	7 (3.5)	13 (9–15)	97.14	
Marital status				
(single, divorced,	37 (18.5)	13 (8.5–15)	100.82	
widow)	163 (81.5)	12 (9–15)	100.43	0.970^{a}
Married				
Hospital				
Rafedia	35 (17.5)	12 (8–14)	94.13	
Al-watany	33 (16.5)	13 (10–16)	112.74	
Jenin	27 (13.5)	11 (8–15)	96.39	0.194 ^b
Tubas	21 (10.5)	11 (8–14)	92.95	
Tulkarm	45 (22.5)	14 (10–16)	114.59	
Qalqelia	39 (19.5)	10 (7–15)	86.51	

Table 4-4. knowledge score by socio-demographic variables.

27				
Department				
ER	35 (17.5)	13 (10–15)	109.46	
ICU	27 (13.5)	14 (11–15)	119.72	
N.ICU	21 (10.5)	12 (8–16)	99.02	
Paediatric	33 (16.5)	9 (7.5–13)	73.20	0.000^{b}
Men.M.W	41 (20.5)	11 (9–16)	101.78	
Women.M.W	28 (14.0)	10 (8–13)	78.16	
CCU	7 (3.5)	16 (15–17)	155.79	
Gynaward	4 (2.0)	10.5 (2.25–18)	98.00	
General	4 (2.0)	17.5 (14.75–18.75)	174.38	
Position				
Staff nurse	185 (92.5)	12 (8.5–15)	99.08	
Head nurse	11 (5.5)	14 (5–15)	97.45	0.035 ^b
Supervisor	4 (2.0)	17.5 (14.75–18.75)	174.38	
Residency				
Tulkarm	47 (23.5)	13 (10–16)	111.85	
Nablus	67 (33.5)	12 (9–15)	101.31	
Jenin	37 (18.5)	10 (8.5–14.5)	92.81	
Qalqelia	40 (20.0)	11.5 (7.25–15.75)	95.34	0.538 ^b
Tubas	9 (4.5)	12 (8–14)	89.72	
Years of working				
Less than 5 years	49 (24.5)	12 (8–15.5)	100.11	
5 to less than 10	71 (35.5)	12 (9–16)	104.74	0.710^{b}
10 years or more	80 (40.0)	12.5 (8–15)	96.98	
Educational status				
Diploma	51 (25.5)	11 (7–15)	93.18	
BS	129 (64.5)	12 (9–15)	100.48	0.230 ^b
MS	20 (10.0)	14 (9.25–15.75)	119.28	
CPR Training				
Yes	175 (87.5)	13 (9–15)	102.83	0.131 ^a
No	25 (12.5)	9 (7–16.5)	84.18	

^a Statistical significance of differences calculated using the Mann–Whitney U-test

^b Statistical significance of differences calculated using the Kruskal–Wallis test

ER: emergency room, ICU: intensive care unit, NICU: neonatal intensive care unit, MW: medical word, CCU: cardiac/coronary care unit, BS: bachelor degree, MS: master degree.

4.4. Description of the obstacles that nurses encountered

Table 5 describes the obstacles that nurses had when giving the medications to patients that caused medication errors to occur. The results show that about half of nurses (46.5%) agreed that an obstacle was that the names of many medications are similar, but 40% of them disagreed. More

than half of the nurses (61%) agreed that similar-looking medication packaging was also an obstacle, while only (38%) agreed that the mixing of resuscitation medications with other drugs was an obstacle although it is one of the main causes of medical errors. About half of nurses agreed that abbreviations used in place of writing the orders out completely and oral orders being used instead of written orders were unhelpful. Confusing prescriptions and unclear dose calculations were also obstacles, but 42% disagreed that Pharmacy delivered incorrect doses and 31.5% agreed on this; 46.5% disagreed that Pharmacy did not label the medication correctly compared to 38% agreeing, and more than half (61%) agreed that Pharmacists not staying all day was an obstacle (23% disagreed). 39% agreed that poor communication between physicians and nurses was an obstacle and 43% did not; only 26.5% disagreed there was insufficient knowledge regarding resuscitation medications.

Table 5 also shows that more than half (53.5%) of nurses took unconfirmed information from colleagues, moreover 54.5% of them agreed that there was a disagreement of opinions between doctors and nurses. 49.5% of nurses said there were no references to refer to for resuscitation medications and only 31% disagreed. 45% of the nurses were embarrassed to ask questions about resuscitation medications and 36.5% were not. It was acknowledged that interruptions during drug administration procedures among nurses (e.g., being asked to handle other tasks) were an obstacle for about half of them (48.5%), but not for 33.5%. Only 21% did not consider that general chaotic conditions in the CPR procedure (such as many people

handling a single drug) was an obstacle, and more than half of nurses considered that deficiency and inaccessibility to resuscitation medications and unawareness of patient allergies were obstacles.

 Table 4-5. Description of obstacles encountered by nurses during medication administration.

Variable	Frequency (%)
O1- similarity of medications name	
Strongly agree	29 (14.5)
Agree	64 (32.0)
Neither agree or disagree	27 (13.5)
Disagree	65 (32.5)
Strongly disagree	15 (7.5)
O2- Different medications look alike in packaging	
Strongly agree	33 (16.5)
Agree	89 (44.5)
Neither agree or disagree	20 (10.0)
Disagree	38 (19.0)
Strongly disagree	20 (10.0)
O3- Mixing of resuscitation medications with other drugs.	
Strongly agree	34 (17.0)
Agree	42 (21.0)
Neither agree or disagree	25 (12.5)
Disagree	68 (34.0)
Strongly disagree	31 (15.5)
O4- use Abbreviations in place of writing the whole orders.	
Strongly agree	36 (18.0)
Agree	67 (33.5)
Neither agree or disagree	33 (16.5)
Disagree	52 (26.0)
Strongly disagree	12 (6.0)
O5- Verbal orders are used instead of written orders.	
Strongly agree	41 (20.5)
Agree	65 (32.5)
Neither agree or disagree	34 (17.0)
Disagree	40 (20.0)
Strongly disagree	20 (10.0)
O6- Confused prescription	
agree Strongly	40 (20.0)
Agree	61 (30.5)
Neither agree or disagree	44 (22.0)
Disagree	41 (20.5)
Strongly disagree	14 (7.0)
O7- Unclear dose calculation	
agree Strongly	32 (16.0)
Agree	64 (32.0)

30			
Neither agree or disagree	37 (18.5)		
Disagree	52 (26.0)		
Strongly disagree	15 (7.5)		
O8- Pharmacy delivers incorrect doses			
Strongly agree	26 (13.0)		
Agree	37 (18.5)		
Neither agree or disagree	51 (25.5)		
Disagree	63 (31.5)		
Strongly disagree	23 (11.5)		
O9- Pharmacy does not label the medication correctly			
Strongly agree	27 (13.5)		
Agree	49 (24.5)		
Neither agree or disagree	31 (15.5)		
Disagree	74 (37.0)		
Strongly disagree	19 (9.5)		
O10- Unavailability of pharmacists throughout the day			
Strongly agree	52 (26 0)		
Agree	70 (35.0)		
Neither agree or disagree	32(160)		
Disagree	32(10.0) 34(17.0)		
Strongly disagree	12(60)		
O11. Lack of communication between doctors and nurses	12 (0.0)		
Strongly agree	27 (13 5)		
	51 (25 5)		
Neither agree or disagree	36 (18 0)		
Disagree	70(350)		
Strongly disagree	16 (8 0)		
O12 Insufficient knowledge regarding resuscitation	10 (0.0)		
medications			
Strongly agree	41 (20 5)		
Δ gree	56 (28.0)		
Neither agree or disagree	50 (25.0)		
Disagree	40(20.0)		
Strongly disagree	13 (6 5)		
013 Percention of uncertain answers from other nurses	15 (0.5)		
Strongly agree	34 (17.0)		
A gree	73(365)		
Neither agree or disagree	41(205)		
Disagree	41(20.5)		
Strongly disagree	7(35)		
014 Divergence of entries between degter and purse	7 (3.3)		
Strongly agree	41 (20.5)		
A gree	41(20.3)		
Neither agree or disagree	35(175)		
Disagree	33(17.3)		
Strongly diagram	40(24.0)		
O15 No references for the use of requesitation medications	8 (4.0)		
O15- No references for the use of resuscitation medications	48 (24.0)		
Strongry agree	46 (24.0)		
Agree Neither same or discorres	31(23.3) 20(10.5)		
Neither agree of disagree	59 (19.5) 52 (26.0)		
Disagree	52 (26.0)		
Strongly disagree	10 (5.0)		

O16- Embarrassment from asking colleagues about	
resuscitation drugs	
Strongly agree	30 (15.0)
Agree	60 (30.0)
Neither agree or disagree	37 (18.5)
Disagree	57 (28.5)
Strongly disagree	16 (8.0)
O17- Interruption during drug administration to do other	
tasks at the same time	
Strongly agree	40 (20.0)
Agree	57 (28.5)
Neither agree or disagree	36 (18.0)
Disagree	54 (27.0)
Strongly disagree	13 (6.5)
O18- General mess during resuscitation as many people are	
handling the same medication	
Strongly agree	61 (30.5)
Agree	63 (31.5)
Neither agree or disagree	34 (17.0)
Disagree	36 (18.0)
Strongly disagree	6 (3.0)
O19- Shortage of resuscitation medications and need to	
borrow from other wards.	
Strongly agree	47 (23.5)
Agree	60 (30.0)
Neither agree or disagree	32 (16.0)
Disagree	48 (24.0)
Strongly disagree	13 (6.5)
O20- Nurse is unaware of a known allergy.	
Strongly agree	49 (24.5)
Agree	69 (34.5)
Neither agree or disagree	31 (15.5)
Disagree	42 (21.0)
Strongly disagree	9 (4.5)

O: obstacles encountered by nurses.

4.5. Classify nurses according to knowledge level and need training

Table 6 describes that 60% of nurses see they have "sufficient" or "relatively sufficient" knowledge levels about resuscitation medications and only 19% see they have "insufficient knowledge"; most of them (70.5%) gave the opinion that they needed further training about resuscitation medications.

Variable	Frequency (%)
As your opinion, your knowledge level about	
resuscitation medications is;	
Sufficient	38 (19.0)
Relatively sufficient	82 (41.0)
Fair	42 (21.0)
nsufficient	32 (16.0)
Extremely insufficient	6 (3.0)
As your opinion, do you need a training about	
resuscitation medications:	
Need	141 (70.5)
No comment	32 (16.0)
No need	27 (13.5)

 Table 4-6. Self-evaluation of knowledge level and training needs for

 resuscitation medications.

4.6. Causes of medication administration errors not being reported

Table 7 shows why medication administration errors are not reported. More than half of nurses (58%) agreed that the differences between the nurses' and hospital's definition of a "ME" was a reason to not report an error, however 48% of them didn't consider that not recognising errors occurred as a reason for this (15% neutral). 41.5% of nurses did not consider that filling out an incident report for a ME takes a long time was a reason (21% neutral), while 42.5% considered that contacting the physician about an error takes a long time and was a reason not to report an error (18.5% neutral). More than half of nurses (53.5%) agreed that MEs are defined in a vague way, while half of them (49.5%) disagreed that nurses think that the mistake was not important to be reported (16.5% neutral).

Fifty five percent of nurses thought that other nurses would think they are unqualified if they make MEs and so did not report it, and 67.5% were afraid that patients or their families might develop a negative attitude toward them, or take legal action against them, and so they did not report MEs (12% neutral). 46% were worried the physician would reprimand them for the MEs (17.5% neutral), and more than half (61.5%) of nurses panicked about adverse consequences from reporting MEs (12.5% neutral); 54% of them agreed that nursing administration did not take proper action that matched the severity of errors (23.5% neutral) and most of the nurses (71.5%) said they might be blamed if something happened to the patient as a consequence of the ME and so did not report it. 59% said that they saw no encouragement for correctly administering medication (20.5% neutral), but a high value was attributed to a medical error as an indication of medical care provided by nurses, therefore, 62.5% of nurses didn't report the errors; most nurses (71.5%) noticed that nursing Administrators focused on the person rather than the system when a ME occurred.

Variable	Frequency (%)
R1- there is no compatibility in definition of a medication	
error between hospitals and nurses	
Strongly agree	29 (14.5)
Agree	87 (43.5)
Neither agree or disagree	37 (18.5)
Disagree	42 (21.0)
Strongly disagree	5 (2.5)
R2- Nurses aren't aware of the error happening	
Strongly agree	23 (11.5)
Agree	51 (25.5)
Neither agree or disagree	30 (15.0)
Disagree	66 (33.0)
Strongly disagree	30 (15.0)
R3- Filling out the incident report form takes a lot of time.	
Strongly agree	
Agree	29 (14.5)
Neither agree or disagree	46 (23.0)
Disagree	42 (21.0)
Strongly disagree	70 (35.0)
	13 (6.5)

34	
R4- It takes a lot of time to contact a doctor about a	
medication error.	
Strongly agree	26 (13.0)
Agree	59 (29.5)
Neither agree or disagree	37 (18.5)
Disagree	67 (33 5)
Strongly disagree	11 (5 5)
P5 The definition of a medical error is not obvious	11 (5.5)
Strongly agree	30 (15 0)
A grad	50 (15.0) 77 (28.5)
Agiee Neither correct on discourse	77 (30.3)
Neither agree or disagree	35 (17.5)
Disagree	49 (24.5)
Strongly disagree	9 (4.5)
R6- Nurses believe a medical error is insignificant enough to	
document.	
Strongly agree	24 (12.0)
Agree	44 (22.0)
Neither agree or disagree	33 (16.5)
Disagree	73 (36.5)
Strongly disagree	26 (13.0)
R7- Nurses believe that their colleagues will think they are	
incompetent when making a medical error.	
Strongly agree	40 (20.0)
Agree	70 (35.0)
Neither agree or disagree	29 (14 5)
Disagree	44 (22.0)
Strongly disagree	17 (8 5)
R8- patients or their families might have developed a negative	17 (0.3)
attitude toward the nurses or take a legal action if they report	
a medication error	
a medication error.	50 (25 0)
A grad	50 (25.0) 85 (42.5)
Agree Noither agree or disagree	03 (42.3) 24 (12.0)
Discourse	24(12.0)
Disagree	33 (10.5)
Strongly disagree	8 (4.0)
R9- Nurses fear that the doctor will blame them for medical	
errors.	
Strongly agree	33 (16.5)
Agree	59 (29.5)
Neither agree or disagree	35 (17.5)
Disagree	52 (26.0)
Strongly disagree	21 (10.5)
R10- Fear of consequences when reporting a medical error.	
Strongly agree	
Agree	53 (26.5)
Neither agree or disagree	70 (35.0)
Disagree	25 (12.5)
Strongly disagree	39 (19.5)
	13 (6.5)
R11- Nursing management response does not match the	
severity of the error.	
Strongly agree	36 (18.0)
Agree	73 (36.5)
Neither agree or disagree	47 (23 5)
Disagree	38 (19.0)
Strongly disagree	6(30)
Stongry disugree	0 (3.0)

R12- Fear of blame if something bad happened to the patient	
because of a medical error.	
Strongly agree	59 (29.5)
Agree	84 (42.0)
Neither agree or disagree	29 (14.5)
Disagree	18 (9.0)
Strongly disagree	10 (5.0)
R13- Lack of appreciation when administering medication in	
a healthy way.	
Strongly agree	42 (21.0)
Agree	76 (38.0)
Neither agree or disagree	41 (20.5)
Disagree	34 (17.0)
Strongly disagree	7 (3.5)
R14- The reliance on medical errors as a measure of the	
quality of the nursing care provided.	
Strongly agree	47 (23.5)
Agree	78 (39.0)
Neither agree or disagree	35 (17.5)
Disagree	30 (15.0)
Strongly disagree	10 (5.0)
R15- Management concentrate on the individual rather than	
the system as the cause of medical error.	
Strongly agree	59 (29.5)
Agree	84 (42.0)
Neither agree or disagree	25 (12.5)
Disagree	26 (13.0)
Strongly disagree	6 (3.0)

R: causes of not reporting MEs.

4.7. Suggestion for decreasing MEs

Table 8 shows that most of the nurses strongly agreed on the solutions I suggested to them: 1) a better arrangement of medications by names, labels and packages can increase correct and safe use by healthcare providers (71.5%); 2) create a continuous learning and training program for nursing staff (71%); 3) preparing a trained CPR team is necessary for professional resuscitation action (65%) which is called "code blue"; 4) provide better access to reference information about drugs (69%), and 5) provide a clinical pharmacist in the departments as a reference for medicines to help nurses (66.5%).

Additionally, some of the nurses suggested other solutions, like increasing the number of nurses on the staff to decrease the general workload, the establishment of an electronic medical library within reach of nursing hands, and giving the nursing role value when dealing with them, and not treating them just as a tool to execute orders.

Variable	Frequency (%)
S1- good arrangement of medications by names,	
labels and packages can increase correct and	
safety use by healthcare providers.	
Strongly agree	143 (71.5)
Agree	46 (23.0)
Neither agree or disagree	6 (3.0)
Disagree	2 (1.0)
Strongly disagree	3 (1.5)
S2- make a continuous learning and training to	
nurses staff.	
Strongly agree	142 (71.0)
Agree	44 (22.0)
Neither agree or disagree	8 (4.0)
Disagree	5 (2.5)
Strongly disagree	1 (0.5)
S3- Preparing a trained CPR teams is therefore	
necessary for professional resuscitation action.	
strongly agree	130 (65.0)
Agree	55 (27.5)
Neither agree or disagree	11 (5.5)
Disagree	3 (1.5)
Strongly disagree	1 (0.5)
S4- provide a more effective source or reference	
for information about drug.	
Strongly agree	138 (69.0)
Agree	47 (23.5)
Neither agree or disagree	9 (4.5)
Disagree	5 (2.5)
Strongly disagree	1 (0.5)
S5- Providing clinical pharmacist in the	
departments as a reference for medicines to help	
nurses.	
Strongly agree	133 (66.5)
Agree	44 (22.0)
Neither agree or disagree	14 (7.0)
Disagree	7 (3.5)
Strongly disagree	2 (1.0)

Table 4-8. Suggestion for decrease MEs.

CPR: Cardiopulmonary resuscitation, S: suggestion for solution.

Chapter Five

Discussion

Discussion

This study is one of the first in Palestine that has been performed to determine factors that affect sufficient knowledge among nurses about resuscitation medication, to discuss the obstacles they encountered during medication administration, to explain causes behind not reporting MEs, and to suggest solutions to decrease MEs.

Inadequate knowledge among nurses is deemed to be one of the most important reasons behind medication administration errors (Phillips et al., 2001, Gladstone, 1995, Zyoud et al., 2019).

In our study, the correct answer rate regarding resuscitation medications was only 58.6%, which was quite low compared with a similar study done in Taiwan 70.5% (Chen et al., 2014), and 60.9%, 56.5%, 75.8% in studies done in Palestine and Taiwan respectively (Zyoud et al., 2019, Hsaio et al., 2010, Lu et al., 2013), additionally proves that nurses are lacking information about resuscitation medications and high alert medications. The question about giving 15% KCl as an IV push in emergency cases such as ventricular fibrillation achieved the correct answer rate of 87.5%, which showed good knowledge to avoid ME which can cause cardiac arrest and death; it was a higher rate compared to a study done in Palestine about high alert medications which was 76.8% (Zyoud et al., 2019), but lower than a

similar study conducted in Taiwan (95.2%) (Chen et al., 2014), and same result as Lu et al. (Lu et al., 2013), 68.5% of nurses gave a correct answer for not giving amiodarone by the trachea to increase the effects, which is considered high compared with the same study done in Taiwan, which only achieved 42.0% (Chen et al., 2014), but still low, because there is no absorption for amiodarone through the trachea (Neumar et al., 2010). In contrast, 63.5% of nurses still thought that atropine could be used in pulseless electrical activity treatment, which was the lowest correct answer rate, while only 29.8% of nurses answered incorrectly/don't know about this question by Chen et al. (Chen et al., 2014) which indicates low knowledge. The next lowest correct answer rate was 44.5% representing that more than half of the nurses who did not know that body weight is used in an epinephrine dose calculation for the resuscitation of a child, which is comparable result with a study conducted in Taiwan (Chen et al., 2014). CaCl₂ injection should be administered gradually into a large vein, but 53.5% of nurses did not recognise that; the same result found by Zyoud et al. (Zyoud et al., 2019), while only 39.2%, 49% of nurses answered incorrectly in studies done in Taiwan (Lu et al., 2013, Chen et al., 2014). Thirty eight percent of nurses answered incorrectly about the inability to switch between 10% Ca gluconate and 10% CaCl₂ which the same result as study conducted in Palestine (Zyoud et al., 2019), but lower correct rate than studies done in Taiwan (Lu et al., 2013, Chen et al., 2014).

It was found that the nurses lacked sufficient information about the drugs they are giving. A positive direct effect was shown between knowledge score with male participants (p = 0.001). These findings are comparable with a study conducted by Zyoud et al. about high alert drugs (Zyoud et al., 2019), and with nurses that worked in CCU, ICU, and general wards (p < 0.001). In Taiwan, the same result was found that nurses who worked in the ER or ICU departments had more knowledge than those who worked in the medical-surgical wards and obstetric-paediatric wards (Chen et al., 2014). Moreover, in medical and surgical wards, medical errors occurred more frequently, according to Sheu et al. (Sheu et al., 2009).

Our study observed that there was a significant difference according to the nurses position, with supervisor nurses having a higher score compared to staff and head nurses (p = 0.035); Zyoud et al.'s study also considered position as factor affecting knowledge score and found head nurses had the highest score (Zyoud et al., 2019).

There was a negative relationship between knowledge score and age, marital status, hospital, residency, years of working, education level and CPR training. However, a positive relationship between years of working and knowledge score had been found in several studies (Chen et al., 2014, Lu et al., 2013, Hsaio et al., 2010), and between educational level and knowledge score (Zyoud et al., 2019), also between CPR training and knowledge score (Chen et al., 2014).

To increase nurses pharmacological knowledge about resuscitation medication and increase patients' safety, the common obstacles that nurses face and which lead them to make errors should be known. In our study, we found that the major obstacle nurses faced when administering resuscitation medication was a chaotic environment during CPR, for example, with a lot of people handling a single drug (62%). This was the third of 12 obstacles that nurses encountered in a study completed by Chen et al. (Chen et al., 2014), and Ornato et al. also mentioned that too many individuals present in the resuscitation room, as well as poor teamwork and leadership could result in errors in the resuscitation system (Ornato et al., 2012). Moreover, the unavailability of pharmacists' for the whole day (61%) and the similarity of different medications packaging (61%) were further obstacles.

Several studies found that a deficiency in pharmacological knowledge is the major reason for MEs. For example, inadequate knowledge was the major obstacle that nurses faced in Taiwan (75.4%) (Hsaio et al., 2010), and 28.2% of nurses considered it is an obstacle (Chen et al., 2014). Furthermore, in our research, 48.5% of nurses considered having inadequate knowledge as a major obstacle, while another study considered interruptions during drug administration as the main obstacle 62.8% (Chen et al., 2014), while 48.5% of nurses in our study agreed with that, another studied poor communication between nurses and physicians was an important obstacle (Andersen et al., 2010a, Zyoud et al., 2019). In our study, 39% of nurses considered that, it was essential to establish more trained and cooperative CPR teams for professional resuscitation action.

Sixty percent of nurses believed that they had sufficient knowledge levels about resuscitation medications, while only 8% of nurses in Taiwan thought that (Chen et al., 2014), and just 3.6% and 23.6% of nurses thought themselves to have adequate knowledge regarding high alert medications in Taiwan and Palestine respectively (Hsaio et al., 2010, Zyoud et al., 2019). Most nurses acknowledged that they needed training about resuscitation medications as well as other studies (Chen et al., 2014, Zyoud et al., 2019, Hsaio et al., 2010).

In our study, we found that nursing management focused on the person rather than the system when a ME occurs (71.5%), and If anything happens to the patient, nurses thought they would be blamed as a consequence of the ME (71.5%) , which were the major causes behind not reporting medication administration errors. The other most important cause was negative attitudes that may develop by patients and their families towards the nurse, or that they may litigate against the nurse if a ME is reported (67.5) (Naome et al., 2020, Alsulami et al., 2019). Mansouri et al.'s study mentioned that the MEs were not documented for three reasons: fear of the consequences after reporting an error, procedural obstacles and management problems (Mansouri et al., 2019), and in our study, the fear of adverse consequences was important barrier to report incidents.

To enhance ME reporting, we have to create an encouraging and supportive environment with no blame and dishonor when genuine mistakes are made. Teaching nurses on how and what to report about incidents, and giving rewards to encourage incident reporting would help. Increasing the provision of corrective actions regarding the incident reports, such as training health providers to recognise medical incidents, and the existence of a reporting system would be beneficial (Naome et al., 2020).

We suggested solutions to increase patient safety and the nurses agreed with them. These were; improved arrangement of medications' names, labels and packages can increase the proper use of medications by health care providers and improve patient safety; create a continuous learning and training programme for nurses and staff (Murugan et al., 2019, Di Simone et al., 2018, Zyoud et al., 2019), prepare more trained and cooperative CPR teams to increase the efficiency of resuscitation actions (Ornato et al., 2012); provide a more effective source of reference for information about drugs; provide a clinical pharmacist all the time for departments as a reference to help nurses (Folli et al., 1987, Kaushal et al., 2008).

5.1 Strengths and limitations

5.1.1 Strengths

This study was one of the first to evaluate nurses' knowledge and understanding of the obstacles they face when giving resuscitation medications to the patients, and the reasons behind the low reporting of MEs in Palestine.

5.1.2 Limitations

1. This is a cross-sectional study and it is therefore difficult to prove causal relationships between the scales and their associated factors.

- 2. Because information was collected via a face-to-face interviews, the interviewer's bias may influence the results.
- 3. Samples were collected only from the north area of the West Bank, which could be considered a limiting factor.
- 4. Samples were collected from all departments of the hospital, not only ICU and ER departments, because we needed 200 nurses and the number of nurses in these departments was insufficient.

Chapter Six Conclusions and Recommendations

6.1 Conclusion

In conclusion, in our study the correct answer rate was only 58.6%, which indicates a poor knowledge among nurses, which is an obstacle leading to MEs to occur. This study has demonstrated that a higher knowledge score was found in male nurses and nurses working in CCU, ICU and general departments, but no differences were noted between nurses with regard to age, marital status, hospital, residency, years of working, educational status, CPR training.

Chaotic condition in CPR was the most common obstacle that nurses faced in resuscitation medication administration at a rate of 62% according to our results. In addition, the nursing management focused on the person rather than the system when a ME occurs and If anything happens to the patient, and nurses thought they would be blamed as a consequence of the ME which were the major causes behind not reporting medication administration errors; also nurses would like to have extra training to improve and update their pharmacology information.

6.2 Recommendations

According to the results and conclusions of this study, nurses favour to collaborate with pharmacists to arrange medications in a better way, so that names, labels and packages are clearer to find and use. Continuous learning and training for nurses staff, better preparation and an organised training for CPR teams to make resuscitation actions in a coordinated and professional way as a code blue team; providing a more effective source of reference material for information about drugs for nurses, and providing a clinical pharmacist in all departments as a reference help nurses.

Additionally, hospitals should increase the number of nursing staff to decrease their workload on them. Establishing an electronic medical library within the reach of nursing hands could give nurses valuable tools to execute orders. Lastly, by organising a calm and disciplined CPR environment can improve communication between nurses and physicians to decrease MEs.

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55 Appendices

Appendix 1

Data Collection Form

Data collection for Evaluation of nurses' knowledge and understanding of obstacles encountered when administering resuscitation medications

***** SECTION A

DEMOGRAPHIC DATA

Gender	Age:	Marital status:
☐ Male☐ Female		
Hospital :		
Current position :		
Department :		
Residency :		
years of working : Less than 5 years 	\Box 5 to less than 10 years	\Box 10 or more
Educational status:		
Diploma degree	 Bachelors (B.S.) degree 	□ Master (M.S.) degree
Specialization :		
CPR experience in years Training background in Yes	: CPR : No	

***** SECTION B

knowledge of nurses

Questions	true	false	I don't know
1-In the event of an emergency such as ventricular fibrillation, push fast 15% KCl 10mls via IV. في حالة الطوارئ مثل الرجفان البطيني نعطي بوتاسيوم كلور ايد 10مل داخل الأو عية كدفعة و احدة.			
2-With cardiac arrest, fast IV push 1 mg epinephrine within 3-5 minutes. في حالة السكتة القابية نعطي ابنيفرين [مليغرام في الأوعية الدموية خلال 3-5 دقائق			
3-When injecting dopamine, small venous vessels are preferred. عند حقن الدوبامين يفضل حقنه في الشريان الصغير			
4-Levophed (norepinephrine bitartrate)should be added to glucose water to preserve the drug effects. النور ابينيفرين يجب أن يضاف لماء مع جلوكوز للاحتفاظ بغاعلية الدواء			
5-In order to induce additive effects, NaHCO3 should be injected with epinephrine لزيادة فعالية الابنيفرين يتم حقنه مع صوديوم بايكربونيت			
6-When CPR is initiated, glucose water should always be given in order to prevent hypoglycemia. عند بدء الإنعاش القلب الرئوي يتم إعطاء الجلوكوز لتجنب هبوط السكر			
 7- 10% Ca glucose and 10% CaCl₂ are the same drug and interchangeable. ۲۵% کالسیوم جلو کوز یشابه 10% کالسیوم کلور اید ویمکن التبدیل بینهما 			
8-Amiodarone is used to treat bradycardia. اميودارون يستخدم في حالة تباطؤ نبضات القلب			
9-Use nitroglycerine to treat cardiac infarction with low blood pressure and bradycardia. يستخدم نيتر وجليسيرين في علاج احتشاء عضلة القلب مع هبوط الضغط و علاج تباطؤ نبضات القلب			
10-Fast IV push 1:1000 epinephrine (adrenaline) 1 amp for patients with mild allergic reaction. إعطاء دفعة واحدة في الوريد من الابنيفرين (أدرينالين) بتركيز 1:1000 أمبولة واحدة في حالة الحساسية الخفيفة			
11-Atropine is used to treat pulse less electrical activity. يستخدم الاتروبين لعلاج قلة نشاط النبض الالكتروني			
12-If a ward stores atracurium for trachea intubation, the drug should be stored with other drugs and easily accessed by nurses. إذا قام القسم بتخزين اتر اكوريوم الذي يستخدم عند إدخال أنبوب في القصبة الهوائية يتم تخزينه مع أدوية أخرى وبطريقة يسهل وصول الممرضين إليه			
13-If the drugs are given through the trachea, the dosage is 5 to 10 times higher than when given through the IV route.			

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إذا تم إعطاء الدواء من خلال القصية الهوائية تضاعف الجرعة		
خمس إلى عشر مرات عن إعطائه في الوريد		
14-In CPR, use a small dose of atropine		
(< 0.5 mg) to prevent bradycardia.		
في حالة الإنعاش القلب الرئوي تستخدم جرعة صغيرة من		
الاتروبين (اقل من 0,5) لتجنب تباطؤ نبضات القلب		
15-Adenosine should be given by slow IV drip		
(> 10 minutes) to treat bradycardia.		
يجب إعطاء الادونيسين في الوريد ببطء (أكثر من 10 دقائق)		
لعلاج تباطؤ نبضات القلب		
16-Lidocaine is the first choice to treat ventricular		
tachycardia or fibrillation.		
ليدوكين هو الخيار الاول لعلاج عدم انتظام نبضات القلب البطيني		
أو الرجفان		
17-In the event of an emergency, fast IV push		
10% $CaCl_210$ ml in 1-2 minutes.		
في الحالات الطارئة يعطى دفعة سريعة من 10% كالسيوم		
كلورايد خلال 1-2 دقيقة في الوريد		
18-Each drug should have multiple concentrations		
for nurses to choose.		
كل دواء يجب أن يتوفر بعدة تراكيز لاختيار الممرضين منها		
19-In pediatric CPR, the body surface area is used		
to calculate the dosage of epinephrine.		
في إنعاش الأطفال مساحة الجسم تستخدم لحساب جرعة		
الابيتيفرين		
20-For better effects, amiodarone is best given		
through the trachea.		
لفعالية أفضل الاميودارون يفضل أن يعطى من خلال القصبة		
الهوائية		

*** SECTION C**

What is the Obstacles you encounters during Medication Administration to

patient?(why Medication Administration errors occur?)

Your level of agreement:

	Strongly agree	agree	Neither agree nor disagree	Disagree	Strongly disagree
1-The names of many medications are similar . أسماء الأدوية متشابهة.					
2-Different medications look alike in packaging أشكال الأدوية متشابهة.					
3-Mixing of resuscitation medications with other drugs. خلط أدوية الإنعاش مع بعضها البعض .					

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4-Abbreviations are used instead of writing the orders out completely. استخدام الاختصار ات مقابل الكلمات بشكل كامل			
5-Verbal orders are used instead of written orders نتم الطلبات بشكل لفظي بدلا من الكتابة			
6- Confused prescription وصفات محيرة			
7- Unclear dose calculation حساب جرعات غیر واضحة			
8-Pharmacy delivers incorrect doses ينقل الصيدلاني جرعات خاطئة			
9- Pharmacy does not label the medication correctly الصيدلاني لا يضع اللاصقات على الأدوية بشكل صحيح			
10-Pharmacists are not available 24 hours a day عدم توفر الصيادلة طيلة اليوم			
11-Poor communication between nurses and physicians . التواصل بشكل قليل بين التمريض والأطباء			
12-In sufficient knowledge regarding resuscitation medications عدم توفر المعلومات الكافية لدى طاقم التمريض حول أدوية الإنعاش			
13-Perception of uncertain answers from colleagues معرفة إجابات غير مؤكدة من الزملاء			
14-Divergence of opinions between doctor and nurse اختلاف الأراء بين الأطباء والممرضين			
15-No references for the use of resuscitation medications عدم وجود مرجع في استخدام أدوية الإنعاش			
16-Being hesitant and embarrassed to ask questions regarding resuscitation medications. أن تكون متر ددا أو محرجا للسؤال حول أدوية الإنعاش			

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17- Interruption of the drug administration procedure when other tasks need to be handled simultaneously الانقطاع خلال عطاء أدوية الإنعاش عندما تطلب مهام أخرى للقيام بها			
18-Chaotic situation in CPR as too many people handling a single drug الوضع الفوضوي في الإنعاش القلب الرئوي أن هناك ناس عدد من الأشخاص الذين يتعاملون مع دواء واحد			
19-Shortage of resuscitation medications and need to borrow from other wards. نقص في أدوية الإنعاش والحاجة إلى الاقتراض من أجنحة أخرى.			
20-Nurse is unaware of a known allergy. عدم علم الممرضين بحساسية معينة لدى المرضى			

As your opinion your Knowledge level about resuscitation medications is ;

```
مستوى معرفتك بأدوية الإنعاش يصنف ك
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	sufficient	Sufficient Relatively Fair Insufficient Extremely insufficient
--	------------	--

As your opinion do you need a training about resuscitation medications:

الإنعاش	، مجال أدوية	ج إلى التدريب في	هل تحتا	
	need		no comment	no need

Section D

Why Medication Administration Errors Not Reporting?

لماذا لا يتم تسجيل الأخطاء الطبية ؟

	Strongly	agree	Neither agree	disagree	Strongly
	agree		nor disagree		disagree
1-Nurses do not agree with hospital's definition of a medication error. لا يتفق الممرضين مع تعريف المستشفى للاخطاء الطبية					
2-Nurses do not recognize an error occurred. الممرضين لا يدركون الأخطاء الطبية التي تحدث					
3-Filling out an incident report for a medication error takes too much time. تعبئة تقرير الخطأ الطبي يأخذ الكثير من الوقت					
4-Contacting the physician about a medication error takes too much time . التواصل مع الطبيب بشأن الخطأ الطبي يأخذ الكثير من الوقت					
5-Medication error is not clearly defined. الأخطاء الطبية غير معرفة بوضوح					
6-Nurses may not think the error is important enough to be reported. اعتقاد الممرضين أن الخطأ الطبي غير مهم كفاية لتسجيله					
7-Nurses believe that other nurses will think they are incompetent if they make medication errors. اعتقاد الممرضين أن الممرضين الأخرين سيعتقدون أنهم غير أكفاء في حالة ارتكابهم أخطاء في الدواء					
8-The patient or family might develop a negative attitude toward the nurse, or may sue the nurse if a medication error is reported. قد يأخذ المريض وأهله انطباع سيء عن الممرض أو قد يقاضونه إذا تم تسجيل الخطأ الطبي					
9-Nurses are afraid the physician will reprimand them for the medication error.					
الممر ضين يخافون من توبيخ الطبيب بسبب الخطأ في إعطاء الدواء					
---	--	--	--		
10- Nurses fear adverse consequences from reporting medication errors. خشية الممرض من العواقب الضارة عند تسجيل الخطأ الطبي					
11-In The response by nursing administration does not match the severity of the error. استجابة إدارة التمريض لا تتطابق مع شدة الخطأ					
12-Nurses could be blamed if something happens to the patient as a result of the medication error. سيتم لوم الممرضين إذا حدث شيء للمريض بسبب الخطأ الطبي					
13-No positive feedback is given for passing medications correctly. لا يتم إعطاء أي ردود فعل إيجابية لتمرير الأدوية بشكل صحيح.					
14-Too much emphasis is placed on medication errors as a measure of the quality of nursing care provided. يتم التركيز بشكل كبير على الأخطاء في الدواء كمقياس لجودة الرعاية التمريضية المقدمة					
15-When medication errors occur, nursing administration focuses on the individual rather than looking at the systems as a potential cause of the error. مند حدوث أخطاء في الأدوية ، تركز إدارة التمريض على الفرد بدلاً من النظر إلى الأنظمة كسبب محتمل للخطاً.					

* Section E

suggestion for decrease medication errors:

اقتراحات لتقليل الأخطاء الطبية.

	Strongly	agree	Neither agree	Disagreed	Strongly
1-well-designed medications'					
names labels and packages can					
support safe and appropriate use					
by healthcare professionals.					
الترتيب الجيد للأدوية ووضع عليها اسمها					
وجرعتها (طوابع) يساهم في استخدامها بشكل					
أ أ أ أ أ أ أ أ أ أ أ أ أ أ أ أ أ أ أ					
2-make a continuous learning and					
training to nurses staff					
التعليم المستمر والتدريب لطاقم الممرضين					
3-Establishing more organized and					
cooperative CPR teams is					
therefore essential for efficient					
resuscitation action.					
إنشاء وتنظيم طاقم متخصص للإنعاش القلب					
الرنوي لريادة فعالية الإنعاش					
4-provide a more effective source					
or reference for information about					
بالمعادر ومراجع تترويد الممر صين					
5-Providing clinical pharmacist in					
the departments as a reference for					
medicines to help nurses.					
تزويد الأقسام يصبدلة سريري كمرجع					
لمساعدة الممر ضين في الأدوية					

Other suggestions to decrease administration medication errors :

Thank you very much for your time....©©© End of the Questionnaire.

63 Appendix 2

Ministry of Health Approval Letter

State of Palestine Ministry of Health - Nablus General Directorate of Education in Health



دولة فلسطين

وزارة الصحة نابلس

الإدارة العامة للتعليم الصحي

Ref.: Date:.....

الرقم: ٢٠٠٠ / ٢٠٠٨ / ٢٠٠٠ C ، ١٨ / ٢٠٠٠ C ، ١٨ / ٢٠٠٠

الأخ مدير عام الادارة العامة للمستشفيات المحترم ، ، ،

تحية واحترام...

الموضوع: تسهيل مهمة طالبة ماجستير - جامعة النجاح

يرجى تسهيل مهمة الطالبة: روان عصام حسين قعدان- ماجستير صيدلة سريرية/ جامعة النجاح، في عمل بحث بعنوان "تقييم معرفة الممرضين وفهمهم للمعوقات التي تواجههم عند اعطاء ادوية الانعاش: دراسة مقطعية من فلسطين"، من خلال السماح للطالبة بجمع معلومات تتعلق بالبحث من خلال تعبئة استبانة من قبل الممرضين (بعد اخذ موافقتهم)، وذلك في:

مستشفى رفيديا – مستشفى الوطني – مستشفى طولكرم

مستشفى قلقيلية – مستشفى جنين – مستشفى طوباس

علما ان البحث تحت اشراف د. سائد زيود. كما انه سيتم الالتزام بمعايير البحث العلمي والحفاظ على سرية المعلومات.

مع الاحترام...

It elvistic

نسخة: عميد كلية الدراسات العليا المحترم/ جامعة النجاح

ص.ب. 14 تلفون: 2333901-09

P.O .Box: 14 Tel.:09-2333901

64 Appendix 3

Institutional Review Board Approval Letter

National University Faculty of medicine &Health Sciences Department of Graduate Studies		جامعة النجاح الوطنية كلية الطب وعلوم الصحة دائرة الدر اسات العليا
	IRB Approval Letter	
Study Title:		
"Evaluation of nurses' know administering resuscitatio	ledge and understanding o on medications: a cross-sect	f obstacles encountered when tional study from Palestine"
Submitted by: Rawan qedan , Dr. Sa'ed Zyoud	l , Samah Al-Jabi	
Date Reviewed: 8 th May 2018		
Date Approved:		
9 th May 2018.		
Your Study titled "Evaluation encountered when administer Palestine" with archived num University IRB committee an	on of nurses' knowledge ring resuscitation medicati nber (7) May 2018 was nd was approved on 9 Ma	and understanding of obstacle ons: a cross-sectional study from reviewed by An-Najah Nation y, 2018.
Hasan Fitian, MD	3	
IRB Committee Chairman		
An-Najah National Univers	sity	

جامعة النجاح الوطنية كلية الدراسات العليا

تقييم معرفة وفهمهم الممرضين للمعوقات التي تواجههم عند اعطاء أدوية الإنعاش: دراسة مقطعية من فلسطين

اعداد

روان عصام قعدان

اشراف د. سائد زيود د. سماح الجابي

قدمت هذه الاطروحة استكمالا لمتطلبات الحصول على درجة الماجستير في برنامج الصيدلة السريرية، من كلية الدراسات العليا، في جامعة النجاح الوطنية، نابلس- فلسطين. تقييم معرفة وفهم الممرضين وفهمهم للمعوقات التي تواجههم عند اعطاء أدوية الإنعاش: دراسة مقطعية من فلسطين إعداد روان عصام قعدان إشراف د. سائد زيود د. سماح الجابي الملخص

الخلفية: تعتبر الأخطاء الدوائية أحد أهم أسباب مراضة المرضى ووفياتهم، حيث تعتبر المعرفة غير الكافية بالعقاقير بين الممرضين عاملاً رئيسياً في الأخطاء التي تحدث عند اعطاء الدواء كما أن أنظمة الإنعاش المجهدة والمعقدة تزيد من هذه الأخطاء. زيادة معرفة الممرضين بأدوية الإنعاش أمر مهم لتحقيق أقصى قدر من سلامة المرضى. هدفت هذه الدراسة إلى تقييم معرفة الممرضين بأدوية الإنعاش والعقبات التي تواجههم عند إعطاء أدوية الإنعاش، بالإضافة إلى تقييم تقارير الأخطاء التي تحدث عند اعطاء أدوية الإنعاش، عالم في معرفة إلى تقييم معرفة المرضين هذه الأخطاء التي تحدث عند اعطاء أدوية الإنعاش، بالإضافة إلى تقييم عارير هذه الأخطاء التي تحدث عند اعطاء أدوية الإنعاش، والمنب الذي يمنع المرضين من عدم الإبلاغ عن هذه الأخطاء التي تحدث عند اعطاء أدوية الإنعاش، والمنب الذي يمنع المرضين من عدم الإبلاغ عن

المنهجية: أجريت هذه الدراسة المقطعية في الضفة الغربية – فلسطين. تم اختيار العينات بطريقة العينة المريحة لجمع البيانات، وتم جمع البيانات عبر استبيان مقابلة وجهاً لوجه، والذي تم الحصول عليه من دراسة سابقة. يتكون الاستبيان من خمسة أجزاء: البيانات الديموغرافية، ومدى المعرفة بأدوية الإنعاش (20 سؤالًا صح – خطأ)، والتقييم الذاتي، والأسباب الكامنة وراء عدم الإبلاغ عن أخطاء الدواء، واقتراحات لتقليل الأخطاء الدوائية.

النتائج: شارك ما مجموعه 200 ممرض في الدراسة. وجد ان كادر التمريض ليس لديهم معرفة كافية عن أدوية الإنعاش؛ كان معدل الاستجابة الصحيحة 58.6% فقط. كان معدل المعرفة اعلى لدى الممرضين الذكور والذين يعملون في وحدة العناية المكثفة، ووحدة العناية المكمومة، والعامة،

والذين يشغلون منصب مشرف. كانت العقبة الرئيسية التي واجهها التمريض عند إعطاء أدوية الإنعاش هي البيئة الفوضوية في الإنعاش القلبي الرئوي حيث يتعامل الكثير من الأشخاص مع دواء واحد (62٪)، ومن العقبات الاخرى عدم توفر الصيادلة طوال اليوم (61٪)، والأدوية المختلفة تبدو متشابهة في العبوة (61٪). يأمل معظم الممرضون (70.5٪) في الحصول على تدريب إضافي. في دراستنا وجد ان تركيز ادارة التمريض على الفرد بدلاً من النظام (71%) بالإضافة الى خوف المربلاغ عن الأخطاء التي تتجم عن اعطاء الدواء.

الخلاصة: احدى العقبات التي يواجهها الممرضون هي عدم المعرفة الكافية فيما يتعلق بأدوية الانعاش، ويقول الممرضون ان على الصيادلة ترتيب الادوية بشكل جيد وأن يكون لديهم تعليم مستمر وتدريب إضافي حول أدوية الإنعاش لتقليل الأخطاء الدوائية.