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Nurses' performance regarding intravenous infusion of look-alike sound alike medications at Sohag University Hospital

Khaled Elnouby Mostafa[1], Dr. Zeinab Hussein Ali[2] and Dr. Naglaa Gamal Eldine Abd Hafez[3]

[1] Demonstrator in Critical Care & Emergency Nursing Department, Faculty of Nursing, Sohag University, Egypt

[2] Professor of Medical Surgical Nursing and Head of Adult Health Nursing Department, Faculty of Nursing, Helwan University, Egypt

[3] Assistant Professor in Critical Care Nursing Department, Faculty of Nursing, Sohag University, Egypt

Abstract

Background: Many drug names look or sound like other drug names. Nurses have great role in prevention of medication issues related to this similarity.

Aim of study: The study aimed to assess the nurses' performance regarding intravenous infusion of Look Alike Sound Alike Medications at Sohag University Hospital.

Design: A descriptive exploratory design was used to achieve the aim of the current study.

Setting: The study was conducted at the critical care units in Sohag university hospital.

Subjects: A convenient sample of all available nurses (100 nurses) who worked at the intensive care units at Soahg University Hospital during the study time.

Tools: two tools were utilized to collect data pertinent to the study namely; Self-administered interview questionnaire, and observational checklist regarding intravenous look alike sound alike medications.

Results: More than half of nurses had corrected total knowledge regarding look Alike & sound alike medication (62%, & 59% respectively). Also more than half of nurses had competent level of practice

Conclusion: Based on the present study findings, it can be concluded that staff nurses had acceptable level of knowledge and practice

Recommendations: conducting training program for nurse about look alike & sound alike medications.

Keywords: look alike, medications, nurses' performance, sound alike

Introduction

Look-alike, sound-alike (LASA) delineates drug confusion caused by visual similarities in physical appearance or packaging, or names with similar spelling and/or phonetics. Despite their similar names, the medications function in the body in quite different ways, and mistaking one for the other could result in serious consequences. (Tingling, 2019).

LASA Medication errors can occur at any of the phases of the medication use process: during prescribing, transcribing, dispensing and/ or administering (Mekonnen, Alhawassi 2018) [10]. Therefore variety of factor can all contribute to of look-alike, sound-alike (LASA) medication errors such as illegible handwriting, unfamiliarity with drug names, similarity in the spelling and/or pronunciation of drug names, newly available products, similar packaging or labeling, similar clinical use, similar strength, dosage forms, frequency of administration, incorrect selection of a similar name from a computerized product list Bryan, *et al.* (2020) [4].

Medications are part of the patient treatment plan, appropriate management about it is critical to ensure patient safety which represent significant challenge facing healthcare systems today. (Alemu *et al.*, 2017) [3]. The administration of medications is primarily the nurse's responsibility, on which spend up to 40% of their time on administering medications. Nurses represent the last safety check in the chain of events in the medication administration process, and are the last safeguard of patient wellbeing (Zhao, *et al.*, 2018) [17].

Nurses play a vital role in prevention of LASA drugs errors through access to accurate, current, readily available drug information, whether the information comes from computerized drug information systems, order sets, text references, or patient profiles.

Furthermore, nurses also must follow proper medication reconciliation procedures. Institutions must have mechanisms in place for medication reconciliation when transferring a patient from one institution to the next or from one unit to the next in the same institution (Pourhossein, *et al.*, 2021) [14].

Significance of the study

Medication errors highly occurs in ICU with means of 1.7 errors per day. It is due to the complexity of ICU setting such as patient acuity level, use of advanced technology, high alert medication, medication calculation, and emergency admission in ICU. Wrong time, omission, missed dose, wrong route, wrong dose. In particular, look-alike and sound-alike is the lead error at the level of physicians, nurses, and pharmacist. (Zhong & Feinstein, 2018) [18]. Therefore, researchers used chart reviews and mathematical methods to identify problematic pairs of drug names, and constructed an automated detection system to detect and prevent Look Alike Sound Alike errors (Rash, Foanio and Galanter 2017).

Aim of the study

The aim of the study is to assess the Nurses' performance regarding Intravenous Infusion of Look Alike Sound Alike Medications at Sohag University hospital.

Research questions

- What is the nurses' level knowledge regarding Intravenous Infusion of look A like \ sound like medication?
- What is the nurses' level practice regarding Intravenous Infusion of look Alike \ sound like medications?

Subject and method

Technical Design

The technical design for the study included research design, setting of the study, study subjects, and tools of data collection.

Research design

Descriptive exploratory research design was used to achieve the aim of the current study.

Settings

The current study was conducted at the critical care units at Sohag university hospital which include; general intensive care unit, trauma unit, stroke unit, emergency unit, cardiac care unit, cardiopulmonary resuscitation unit, neonatal intensive care unit.

Subjects

Convenience sample was used for this study. All available nurses who worked at the intensive care units at Soahg University Hospital during the study time.

Tools of data collection

To collect data for the study, two different tools were used.

Tool I: Self-administered interview questionnaire

Arabic questioner was developed by the researchers based on review of literature review to assess the nurses knowledge in relation to look alike sound alike medication. (Institute of Safe Medication Practice [ISMP], 2017), this tool consisted of (30) question and divided into (3) parts prescribed as following:-

Part A: Socio-demographic characteristics

This part include: - age, sex. Qualification, years of experience and pervious training about look alike sound alike (LASA)

Part B: Nurses' knowledge questionnaire regarding look alike sound alike (question 1-11)

Part C: Nurses' knowledge questionnaire regarding the nurse's role in look alike sound alike administration, (question 12-30)

Scoring system

Arabic questioner consisted of (30) question in the form of multiple choice question and essay question. The responses of each question was scored correct answer in (MCQ) take +1 while in essay question was scored as correct& complete (2), correct incomplete (+1) the total score of the 56 score. Less than 60%was unsatisfactory and more than 60%was satisfactory.

Tool II: Nurse's practice checklist

This tool was adopted from Hanartty, (2008), Hung and lee, (2010), and Gamal, (2017). It aimed to assess the actual nurses' practice regarding intravenous infusion of look Alike sound like medications, it consisted of (62) questions divided in to 7 major items (nurses responsibilities, policy, prescription, medication preparation, medication administration, post-drug administration role & evaluation, and medication storage).

Scoring system

Observational checklist was scored as correctly done (1), and not done (0). Nurses' responses were summed up and then converted into percent score.

Validity and reliability

Tools Validity

The research tools' content validity was tested to see if they accurately measured what they were supposed to measure. A jury of five experts from Sohag and Halwan University's nursing and medicine faculties examined the content of the tools for comprehensiveness, accuracy, clarity, relevance, and usefulness.

Tools Reliability

The study tools were tested for its internal consistency by Cronbach's Alpha. It was 0.816 for the knowledge questionnaire, and 0.874 for the observation checklist.

II- Operational Design

The operational design for this study included three phases namely; preparatory phase, pilot study, and field work.

Preparatory phase

This phase started with a review of current and past, national and international related literature concerning the subjects of the study, using textbooks, articles, journals, and websites. This review was helpful to the investigator in reviewing and developing the data collection tools, and then the investigator tested the validity of the tool through jury of expertise to test the content, knowledge, accuracy, and relevance of questions for tools.

Pilot study

Pilot study was carried out on 10% of the total study sample (10 nurses) to evaluate the applicability, efficiency, clarity

of tools, assessment of feasibility of field work, beside to detect any possible obstacles that might face the investigator and interfere with data collection.
Necessary modifications were done based on the pilot study findings such as (omission of some questions from tool) in order to strengthen their contents or for more simplicity and clarity. The pilot sample was excluded from the main study sample.

Field work

- Ethical approval was obtained from the scientific research ethical committee of the faculty of nursing, Helwan University. The researcher met the director of critical care unites at Sohag university hospital to clarify the aim of the study and take their approval.
- Data collection of the study was started at the beginning of January 2021, and completed by the end of June 2021
- The purpose of the study was simply explained to the nurses who agree to participate in the study prior to any data collection.
- An oral informed consent was obtained from each participant prior to data collection after explaining the aim of the study.
- They were reassured that the information collected will be treated confidentially, and that it will be used only for the purpose of research.
- The researcher met nurses at the study settings and distributed the questionnaire.
- The nurses answered the questionnaires in the presence of the researcher without referral to text book with in 30 minute and returned it in the same shift.
- The researcher observed each participants' practice for checking the performance of nurses regarding intravenous infusion of lookalike sound alike medications (8-8 shift daily).

Result

Table 1: Percentage distribution of demographic characteristics of the studied (n=100)

Demographic characteristics	N	%
Sex		
Male	61	61
Female	39	39
Age		
– 20-25	46	46
– 25-30	42	42
– 30-35	9	9
– 35-40	2	2
more than 40	1	1
Mean ± SD	26.8 ± 4.72	
Qualification		
– Bachelor	68	68
– Institute	16	16
– postgraduate studies	16	16
Year of experience in the critical unites		
– 1-3 years	9	9
– 3-7 years	28	28
– 7-10 years	56	56
– more than 10 years	7	7
Mean ± SD	4.2 ± 2.18	
Have you had training course related to Look Alike, sound Alike medications		
– No	60	60
– Yes	40	40

Table 2: Percentage distribution of nurses' knowledge regarding General information about the main items (n=100)

Knowledge Items	Satisfactory			
	N	%	N	%
General information about the medications	54	54	46	46
Information about look Alike medication	62	62	38	38
Information about sound alike medications	59	59	41	41
Information about the nursing role in medication administration	86	86	14	14
Information about handling and dealing with medications	78	78	22	22
Total level of knowledge	67.8	67.8	32.2	32.2

Table 3: Percentage distribution of nurses' practice regarding the main items (n=100)

Items	Done			
	N	%	N	%
Nurses Performance as regard Identification of look Alike sound Alike Medication	52	52	48	48
Nurses Performance as regard Sharing of LASA physician prescriptions	67	67	33	33
Nursing performance regard medication preparation	64	64	36	36

Nurse performance regard medication administration	46	46	54	54
Nurse performance regard post medication administration	75	75	25	25
nurse performance regard storage of storage of medication	75	75	25	25
Level of practice	63.2	63.2	36.8	36.8

Table 4: The relation between nurses' knowledge and their personal characteristics

Personnel information		Level of knowledge		Chi-Square	Sig
		Unsatisfactory	Satisfactory		
Sex	Male	11	50	4.399	0.111
	Female	14	25		
Age	20-25	17	29	10.596	0.226
	25-30	6	36		
	30-35	1	8		
	35-40	1	1		
	more than 40	0	1		
Qualification	Bachelor	18	50	3.059	0.548
	Institute	2	14		
	Postgraduate studies	5	11		
Year of experience in the critical unites	1-3 years	20	36	11.275	0.041*
	3-7 years	3	25		
	7-10 years	0	9		
	more than 10 years	2	5		
Have you had training course related to Look Alike, sound Alike medications	No	18	42	2.087	0.352
	Yes	7	33		

Table 5: The relation between nurses' practice and their personal characteristics

Personnel information		level of practice			Chi-Square	Sig
		Low	Moderate	High		
Sex	Male	14	31	16	5.634	0.060
	Female	2	24	13		
Age	20-25	6	29	11	5.233	0.732
	25-30	8	21	13		
	30-35	2	4	3		
	35-40	0	1	1		
	more than 40	0	0	1		
Qualification	Bachelor	12	37	19	4.239	0.375
	Institute	0	10	6		
	postgraduate studies	4	8	4		
Year of experience in the critical unites	1-3 years	1	5	3	1.372	0.968
	3-7 years	4	15	9		
	7-10 years	9	32	15		
	more than 10 years	2	3	2		
Have you had training course related to Look Alike, sound Alike medications	No	8	34	18	.794	0.672
	Yes	8	21	11		

Table 6: The relation between nurses' knowledge and their practice and attitude

		level of knowledge		Chi-Square	Sig
		Unsatisfactory	Satisfactory		
level of practice	Low	2	14	15.058	0.005*
	Moderate	14	40		
	High	8	21		

Table 1: shows that nearly two thirds (61%) of nurses were male. Nearly half (46%) of them had ages ranged from 20:25 years with mean age 26.8 ± 4.72. More than two thirds (68%) of nurses had bachelor degree in nursing. More than half (56%) of them had 7:10 year of experience in the critical unites. Nearly two thirds (60%) hadn't training course related to look alike, sound alike medications.

Table 2: reveals that majority of nurses had satisfactory knowledge regarding General information about the main items: Information about the nursing role in medication administration, and Information about handling and dealing with medications (86%, 778% respectively). Also, more than two thirds (67.8%) of them had unsatisfactory total knowledge regarding General information

Table 3: clarifies that the three quarters (75%) of nurses done practice regarding the main items in the following: nurse performance regard post medication administration, and nurse performance regard storage of storage of medication respectively. On the other hand, more than half (54%) of nurses done practice regarding the main items in Nurse performance regard medication administration

Table 4: shows that there is no statistically significant relation between nurses' knowledge and their personal characteristics except there is statistically significant relation between nurses' knowledge and their Year of experience in the critical unites

Table 5: clarifies that there is no statistically significant nurses' practice and their personal characteristics

Table 6: shows that there a statistically significant relation between nurses' level of knowledge and their practice

Discussion

Regarding demographic characteristics, the current study showed that nearly two thirds of nurses were male. Nearly half of them had ages ranged from 20:25 years. More than two thirds of nurses had bachelor degree in nursing. More than half of them had 7:10 year of experience in the critical unites. Nearly two thirds hadn't training course related to look alike, sound alike medications.

Our study in the line with Mosakazemi, *et al*. (2019). Who conduct study about "A Survey on the Frequency of Medication Errors Caused Due to Look-Alike Drugs in the Emergency Department" they reported that The mean age of the respondents was 27.00 ± 4. 58, More than three quarters of nurses had bachelor degree in nursing. But not with their finding about years of experience which was less than 5

But not in consistent with Ibrahim 2018 who assess of staff nurses' performance when dealing with high alert medication. He founded that less than three quarter of them were graduated from nursing school But with their finding about years of experience where more than half of them having work experience 5 years or more.

Regarding nurses' level of knowledge, the present study shows that more than sixty percent of nurses had a satisfactory level of understanding. From the investigator point of view, this result may be due to nurses were interested with medications that look Alike & sound alike. This finding not in consistent with Abdel-Latif (2016) [1] who assess Knowledge of healthcare professionals about medication errors. He reported that more than half of nurses had poor knowledge.

LASA drug errors is present at every step of the patient care process; prescription, dispensing and administration of drugs which represent primarily the nurse's responsibility. Therefore this error can be prevented when nurses reading prescriptions more carefully and considering them in the context of patient status and diagnoses. (Chanakit *et al.* 2013) [5].

Regarding nurses' practice about look alike sound alike medication, the current study illustrated that majority of nurses have competent level of practice regarding the following items identification of LASA medication, preparation, post medication administration, and storage. From the investigator point of view, this result may be due to enhance skills and performance of staff nurses for patients in critical care units.

This result was in agreement with Manias, *et al*., (2019) [11] who conducted a study entitled "Medication error trends and effects of person related, environment related and communication related factors on medication errors in a critical hospital" and found that majority of nurses had errors in administer of medications. Also Mohammed SR, 2020 in the study titled "assessment of nurses' knowledge and practices about medications administration at emergency hospital" clarified that the majority of the studied subjects (71%) had got unsatisfactory practice level regarding medications administration.

Except for a statistically significant association between nurses' knowledge and their year of experience in critical units, the current study discovered no statistically significant relationship between nurses' knowledge and their personal characteristics.

This result was support with Morrow, (2018) [12] who conducted a study entitled "Quality and Safety of Intermittent Intravenous Infusions" and found that there is no statistically significant relation between nurses' knowledge and their personal characteristics. Conversely, this result was disagreement with Pourteimour, *et al*., (2019) [13] who conducted a study entitled "The Effect of Smartphone-Based Application Learning on the Nursing Staff's Performance in Preventing Medication Errors in the Critical Units" and found that there is a statistically significant relation between nurses' knowledge and their personal characteristics.

Regarding relation between nurses' practice and their personal characteristic, the current study clarified that there is no statistically significant nurses' practice and their personal characteristics.

This result was support with Morrow, (2018) [12] who conducted a study entitled "Quality and Safety of Intermittent Intravenous Infusions" and found that there is no statistically significant relation between nurses' practice and their personal characteristics. Also, this result was congruence with Fatahi, *et al*., (2018) [6] who conducted a study entitled "Evaluation of the Nurses' Performance in the Care of Patients in Critical units in the Hospitals of Kermanshah University of Medical Sciences" and found that there is no statistically significant relation between nurses' practice and their personal characteristics

In terms of the relationship between nurses' knowledge and their practice, the current study found that there is a statistically significant relationship between nurses' level of knowledge and their practice this study finding agreed with Shahin *et al*. (2012) [16] who expressed that there is there is a highly statistically significant association between participants' scores of knowledge and practice. And also contraindicated with Ahamed & Mondal (2014) [2] who revealed that there was tolerably positive connection amongst knowledge and practice of staff nurses.

This result was support with Morrow, (2018) [12] who conducted a study entitled "Quality and Safety of Intermittent Intravenous Infusions" and found that there is statistically significant relation between nurses' knowledge and their practice. Also, this result was congruence with Fatahi, *et al*., (2018) [6] who conducted a study entitled "Evaluation of the Nurses' Performance in the Care of Patients in Critical units in the Hospitals of Kermanshah University of Medical Sciences" and found that there is relation between nurses' practice and their attitude about medications error.

Conclusion

Based on the findings, more than two-thirds of nurses (67.8%) had a satisfactory level of knowledge. Nearly two-thirds of nurses (62%) had incompetent total level of practice.

Recommendations

The following suggestions are made based on the findings of the current research conducting training program for nurse about look alike & sound alike medications provision ICU with simple illustrated booklet about.

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