AJMAS
https://journal.utripoli.edu.ly/index.php/Alqalam eISSN 2707-7179

Article Type

Study of Medication Errors' Types, Factors and Barriers from The Point of View of Nurses at Benghazi Medical Center

Lamya El Adouli[1], Basmah Nouri[1], Sarah Ahmed[2], Hana Abu Baker[1], Dania Mohamed[3]

[1]*Department of Health Administration, Faculty of Public Health, University of Benghazi, Libya*
[2]*Quefia Hospital for Chest Diseases and Surgery, Benghazi, Libya*
[3]*Special Center for Nephrology, Dialysis &Transplantation Benghazi, Libya*

ARTICLE INFO

Corresponding Email. *Lamya.eladoli@uob.edu.ly*
Received: *01-07-2022* ***Accepted:*** *14-07-2022* ***Published:*** *16-07-2022*
Keywords: *Medication Errors, Benghazi Medical Center, Types, Factors, Barriers.*

ABSTRACT

Aims*. This study aimed to identify the most common types of medication errors and the most important factors that contribute to the occurrence of these errors. It also aimed to identify the main barriers to not reporting medication errors at the Benghazi Medical Center (BMC).* ***Methods.*** *The study used the descriptive approach, and the BMC was chosen randomly to be studied among the hospitals in the city of Benghazi. The study population consisted of all nurses working at the Benghazi Medical Center which were (332) nurses, and the response was (90%). The questionnaire was used as a study tool, and for data analysis, (SPSS) used statistical methods of percentages and frequencies.* ***Results****. From the nurses' point of view, the most common type of error in (BMC) was "giving the dose at an unspecified time" (82.7%), and that the most important factors that contributed to medication errors were related to personal factors, namely too much pressure (78.3%), and the most factor related to the surrounding environment was the factor "being interrupted and distracted while working by another person" (75.0%). As for the factors related to poor communication due to writing, the most important factor contributing to the occurrence of error was the inability to read instructions due to poor doctor handwriting (73.0%). In addition, the main barrier to not reporting medication errors was the nurses' uncertainty about what a medication error was (47.3%).* ***Conclusion****. Working on creating electronic systems that include detailed report forms for reporting errors and address all factors that negatively affect the work are worth.*

Cite this article. *El Adouli L, Nouri B, Ahmed S, Abu Baker H, Mohamed D. Study of Medication Errors' Types, Factors and Barriers from The Point of View of Nurses at Benghazi Medical Center. Alq J Med App Sci. 2022;5(2):380-386. https://doi.org/10.5281/zenodo.6845947*

INTRODUCTION

Medication errors are increasingly recognized as a public health concern. It is generally accepted that medication errors have been made in all three levels of the healthcare system (primary, secondary, and tertiary) [1]. According to the Food and Drug Administration agency, approximately 100,000 or more medication errors are reported annually in various settings such as home care, hospitals, and pharmacies [2]. Furthermore, more than 77 percent of medication errors are preventable [3]. Medication errors are a major cause of avoidable injury and harm in health care systems; the cost associated with medication errors has been estimated globally at $42 billion annually [1].

The financial costs resulting from injuries related to drug accidents were estimated to be about $887 million in the year 2000 [4]. Medication errors are the most common type of medical error, and they can result in high mortality, long hospital stays, disability, increased economic burden, life-threatening conditions, birth defects, or increased treatment costs [5,6]

In particular, medication errors have been used as a measure of patient safety [3]. In 2002, the Agency for Healthcare Research and Quality, indicated that medication errors led to the deaths of approximately 7,000 people around the world, which was more than death from work injuries (6000 cases of death) [7]. The studies presented thus far provide evidence that hospitals have an estimated 400,000 preventable drug-related injuries, about 530,000 are in outpatient clinics, and

800,000 are in long-term care settings [8,9]. A research study conducted by the World Health Organization/Regional Office for the Eastern Mediterranean and applied in 6 countries in the Eastern Mediterranean Region (Egypt, Jordan, Morocco, Sudan, Tunisia, and Yemen) drew attention to the high rate of mortality and permanent disability associated with adverse events in some countries of the region. This study was conducted between 2005 and 2008, based on a review of the medical history. The result was that up to 18% of patient admissions in some countries in the region were associated with harm to patients as a result of the health care they received, measured as adverse events.[10]. While a variety of definitions of the term "medication error" have been suggested, this paper will use the definition first suggested by Yu and Dooley (2005). It means "a failure in the treatment process that leads to, or has the potential to lead to, harm to the patient." [11].This study aimed to identify the most common types of medication errors according to the opinions of the nurses at the Benghazi Medical Center and to look at the most important main factors that lead to the occurrence of these errors. In addition, identify the barriers that prevent nurses from reporting these errors and link them to demographic variables such as sex, qualifications, and experience.

METHODS

Study design and setting

This study followed a quantitative research approach, which was a descriptive cross-section study design.

The study setting and participants

The Benghazi Medical Center (a public hospital) was selected randomly. The study population consisted of all nurses working at the Benghazi Medical Center, and their number was 400.

Data collection procedure

This study's data were gathered using a self-administered close-end questionnaire adapted from previous study [12]. It contains the demographic characteristics and questions related to the objective of this study that divided into three sections, the first section dealt with the most common types of medication errors and consisted of 11 quires. The second section consists of factors that lead to the occurrence of medication errors and consists of nine questions. The third section consists of the main obstacles to not reporting medication errors, and it consists of six quires. Collection data was from September 1 to October 31, 2021. The Cronbach s Alpha value of the questionnaire was 88.

RESULTS

This part includes the statistical analysis of the research data using the statistical program and the tables for this analysis. It can be seen from the data in Table 1 that the percentage of females was higher than that of males. As for marital status, half of the participants in the study were single. In addition to that, the highest percentage of nurses participating in this study were working in the departments of emergency and internal medicine.

From the table, it is clear that more than half of the participants had more than five years of experience. Slightly more than half of the participants in this study had a diploma, the lowest was a bachelor's degree, and at the very least it was a master's degree. The demographic variable (shifts in work) The highest was the morning shift, and the lowest was the night shift.

Table 1. Distribution of the research sample according to demographic characteristics

Personal variable	Categories	Frequency	Percentage
Sex	Male	52	17.3%
	Female	248	82.7%
	total	300	100%
Qualification	Diploma	169	56.3%
	Bachelor	123	41%
	Master	8	2.7%
	Total	300	100%

Years of experience	Less than 5 years	107	35.7%
	More than 5 years	193	64.3%
	total	300	100%
Department	General surgery	38	12.7%
	Internal medicine	58	19.3%
	Obstetrics and gynecology	40	13.3%
	Pediatric	43	14.3%
	Emergency	78	14.3%
	Other departments	43	26%
	Total	300	100%
Shift	Morning	138	46%
	Day	62	20%
	Night	35	11.7%
	All	65	21.7%
	Total	300	100%

The key findings from table 2 that present the types of medical errors The most common in the BMC was that giving the dose at an unspecified time (the wrong time) was the first type. From the eleven types, the mission to give the dose was the second. Also, according to the frequencies and percentages of the nurses' answers, they were (giving the drug at a faster rate than the doctor prescribed) and (an error in the way the drug was given as directed) the third and fourth errors. The type of error that ranked last was giving a medication different from the one prescribed.

Table 2. The most common medication errors among nurses

N	Medication error	Frequency	Percentage
1	Giving the dose at an unspecified time (wrong time)	248	82.7%
2	Mission to give the dose	203	67.7%
3	Giving the drug at a faster rate, slower than the doctor prescribed	199	66.3%
4	An error in the way the drug was given as directed	173	57.7%
5	A smaller dose, more than the doctor prescribed	155	51.7%
6	Error in the number of doses	145	48.3%
7	Giving the drug in the wrong concentration	199	39.7%
8	Giving a medication different from the one prescribed	93	31%
9	Giving the medicine in the wrong place	109	36.3%
10	Giving the medicine to the wrong patient	151	50.3%
11	The doctor prescribed the wrong medicine	166	55.3%

In Table 3 and from the perspective of nurses, it was found that interruptions and distractions while working by another person were the first environmental factors. (Inadequate training in administering medication) and (working with a nurse who does not have enough experience) were the second and third environmental factors, respectively. Of the nine environmental factors, (the lighting is not enough) was the last.

Table 3. The most important environmental factors that contribute to medication errors

N	Factor related to the surrounding environment	frequency	Percentage
1	Interruptions and distractions while working by another person	225	75%
2	Poor communication between nurses	211	70.3%
3	Poor communication between doctor and nurses	187	62.3%
4	Lack of adequate adaptation of the nurses	177	59.3%
5	Working with a nurse who does not have enough experience	213	71%
6	Inadequate training in administering medication	222	74%
7	There are no instructions on how to administer the drug inside the departments	152	50.7%
8	Lighting is not enough	107	35.7%
9	There is a disturbance in the department	195	65%

Table 4 shows that 'too much pressure' was the most critical personal factor that contributed to the occurrence of medication errors at the Benghazi Medical Center. The second personal factor, from the point of view of the participants in the study, was fatigue. Lack of skills to administer medicine was the last personal factor that led to medication errors.

Table 4. The most important personal factors that affect the occurrence of medication errors

No	Personal factors	Frequency	Percentage
1	Stress	226	75.3%
2	Too much pressure	235	78.3%
3	Fatigue	231	77%
4	Lack of sleep	203	67.7%
5	Lack of knowledge of medicine	133	44.3%
6	Miscalculation of dose	108	36%
7	Lack of skills to administer medicine	130	34.3%
8	Difficulty dealing with the installation of solutions and administering drug intravenously	110	36.7%
9	Personal neglect	151	50.3%

From the table 5, the most important factor related to miscommunication due to writing was the inability to read the instructions due to the bad handwriting of the doctor. (An error in writing the patient's name or number on the medication) was the last percentage from the other (6) factors.

Table 5. The important factors related to poor communication due to writing

N	Factor related to poor communication due to writing	Frequency	Percentage
1	The inability to read the instruction due to the bad handwriting of the doctor	219	73.0%
2	Not interpreting doctors' instruction correctly	183	61%
3	Not understanding abbreviations	155	51.7%
4	Similarity to the names of medicines	152	50.7%
5	Similarity to the names of patients	130	43.3%
6	An error in writing the patients name or number on the medication	128	42.7%

The table (6) presented the barriers to reporting the medication error, which in the first place was (because I was not sure what the medication error was). The second barrier was (because I do not know for sure when I should report the medication error through the accident report). The last barrier was (because of the fear of the reaction of colleagues at work).

Table 6. The main Barriers to not reporting medication errors

N	Main barriers	Frequency	Percentage
1	Because I am not sure what the medication error	142	47.3%
2	Because I do not know for sure when I should report the medication error through the accident report	122	40.7 %
3	Because of fear of the nursing director reaction	96	32%
4	Because of the fear of the reaction of colleagues at work	42	14%
5	I believe that the mistake I made is not serious and does not need to be reported	68	22.7%
6	Because I was afraid that I would be subjected to disciplinary measures that would make me lose my job	106	35%

DISCUSSION

The findings of this study indicate that a remarkable result to emerge from the data is that the most common medication error among nurses at BMC was the wrong time (not as the prescription time). This may be due to the personal reasons explained by the nursing staff in this study, the first of which was the heavy workload. Especially, the most of nurses who participated in this study work in morning shift which is more heavy work at this time. It is noticeable that among all medication errors the wrong time has less error effect on health, although some classified wrong time as dangerous that may lead to death in some cases[13].However, According to The National Patient Safety Agency, pointed to that worldwide the wrong time error is the second most common type of medication error and, has caused severe harm also in the death of patients[14].This result is in line with the previous result from different studies[12,15,16,13,17] which found that wrong time was a high percentage among other kinds of medication errors.

The second order of the most common medication errors (missing a dose) (67.7%) (the dose that was not taken before the next scheduled dose). This result may be attributed in light of the first error, which is an increase in the burden on nurses, as it was the highest response from both departments. Internal medicine and emergency, and these two higher departments receive cases mostly for initial diagnosis, and it may also be attributed to the lack of alerting the nursing staff to the importance of discipline and attention to dose schedules, and the lack of follow-up and permanent alert by nursing directors to try to avoid that error as much as possible. Second, the study's findings indicate that the factors that contributed to the occurrence of medication errors were classified into three categories (personal, environmental, and factors related to poor communication due to writing). The highest factor in agreement with the occurrence of medication errors from the point of view of the nursing staff was presented within the personal factors, which was (too much work pressure) (78.3%), followed by (fatigue and Stress) at (77%) and (75.3%), respectively. These factors lead to errors occurring in any work environment, and the most serious when they are related to the patient's life and health, and previous research provides strong evidence that a high nursing workload affects patient health outcomes [15]. The second type includes factors related to the surrounding environment that cause medication errors. The results showed that the most critical factors, which were more commonly approved as causing medication errors, were (interruption and distraction during work), with an approval rate of 75.0%. This result is consistent with study [18], which showed that the distraction that occurs between the patient and co-workers or the events that take place in the department are important factors in the work environment leading to the occurrence of medication errors. In contrast, the current result does not agree with the result of the study (19), which showed that environmental factors in the hospital have a weak effect on the occurrence of medication errors from the point of view of nurses. Of the factors related to poor communication due to writing, the factor (the inability to read instructions due to the doctor's bad handwriting) was the most important factor (73.0%). This result agreed with the findings of the study (19), and the findings of the study [18]. There was an initiative by the World Health Organization to address this phenomenon in 2008, which was to encourage the writing of recipes electronically. This is after the number of deaths due to the difficulty

of reading medical prescriptions in America reached 7000 annually [20]. The reporting-error, which is a good way to improve safety in hospitals, must include knowing what the error is, addressing harmful circumstances, and admitting mistakes. The main reason for not reporting medication errors was uncertainty about the nature of the error, which occurred 47.3% of the time. It occurs when the nurse considers that the delay in the dose date, for example, is not considered a mistake and that it does not have any negative consequences or consequences for the patient's health, and this result is consistent with the study [21], which showed that the lack of information leads to medication errors. Although most of the participants in the study had more than five years of experience at work, 64.3%, most of them were not sure what the medication errors were. This may be attributed to the lack of training programs regarding medication errors, or to the fact that the educational level of the participants was the majority: diploma accounted for 56.3% of the total, more than bachelor and master.

CONCLUSION

The most common medication error in Benghazi Medical Center among the nurses was giving the dose at wrong time. In addition, the most important personal factor that affected the occurrence of medication errors was too much pressure. The factors related to (the surrounding environment) and (poor communication due to writing) were (interruption and distraction during work) and (the inability to read instructions due to the doctor's bad handwriting) respectively. One of the more significant findings to emerge from this study is that not knowing when the medication error was reported through the accident report was one of the most important barriers to reporting medication errors.

Disclaimer

The article has not been previously presented or published, and is not part of a thesis project.

Conflict of Interest

There are no financial, personal, or professional conflicts of interest to declare.

REFERENCES

1. Shrivastava S, Shrivastava P. Ensuring patient safety through reducing medication errors: World Health Organization. International Journal of Health & Allied Sciences. 2020;9(1):86.
2. Goedecke T, Ord K, Newbould V, Brosch S, Arlett P. Medication Errors: New EU Good Practice Guide on Risk Minimisation and Error Prevention. Drug Safety. 2016;39(6):491-500.
3. Ballweg R, Wick K. Medical directors: roles and contributions to PA education. The Journal of Physician Assistant Education. 2005;16(2):130.
4. Cobaugh D, Chen T, Frontini R, Al Hail, Hattingh J, Kurosawa N, et al. Advancing responsible use of medicines globally: The revised Basel Statements, American Journal of Health-System Pharmacy, 2016;73(14):1027-1028. https://doi.org/10.2146/ajhp160425
5. Kanitsaki O. The ethics and practical importance of defining, distinguishing and disclosing nursing errors: A discussion paper. International Journal of Nursing Studies. 2006;43(3):367-376.
6. Woods A, Doan-Johnson S. Toward a Taxonomy of Nursing Practice Errors. Nursing Management (Springhouse). 2002;33(10):45-48.
7. Reddy N. Prevention of errors in health care-patient (Medical customer) safety. Journal of Basic and Clinical Research, 2017:4(2);20.
8. Schoenbaum S, Audet A, Davis K. Obtaining Greater Value from Health Care: The Roles of The U.S. Government. Health Affairs. 2003;22(6):183-190.
9. Leape L. Error in medicine. JAMA: The Journal of the American Medical Association. 1994;272(23):1851-1857.
10. Wilson R, Michel P, Olsen S, Gibberd R, Vincent C, El-Assady R et al. Patient safety in developing countries: retrospective estimation of scale and nature of harm to patients in hospital. BMJ. 2012;344(mar13 3):e832-e832.
11. Yu K. Multiplicity of medication safety terms, definitions and functional meanings: when is enough enough?. Quality and Safety in Health Care. 2005;14(5):358-363.
12. Al-Sarawan R. Medication errors: Nurse's Perceptions of main types and leading factors, and reporting attitudes in North West Bank Governmental Hospitals. An-Najah National University; 2014.

13. Al Adham M, Abu Hamad B. Drug dispensing systems in Gaza hospitals: a comparative study. Eastern Mediterranean Health Journal. 2011;17(10):722-729.
14. Michael R. Information System: Paper-based MARs Marred with Inefficiency. Extended Care Product News-ISSN'. 123 (9): 43-44 National Patient safety Agency (2010). Safety in Doses. Improving the use of medicines in the NHS 2009. NPSA, 2007. http://www.nrls.npsa.nhs.uk/resources/?entryid45=61625
15. Mayo A, Duncan D. Nurse Perceptions of Medication Errors. Journal of Nursing Care Quality. 2004;19(3):209-217.
16. Deans C. Medication errors and professional practice of registered nurses. Collegian. 2005;12(1):29-33.
17. Prot S, Fontan J, Alberti C, Bourdon O, Farnoux C, Macher M et al. Drug administration errors and their determinants in pediatric in-patients. International Journal for Quality in Health Care. 2005;17(5):381-389.
18. AL Qrishah M. The Factors Associated with the Occurrence of Medication Errors in the Ministry of Health Hospitals in Saudi Arabia: A Cross-Sectional Study of Nurses [Internet]. Eres.library.adelaide.edu.au. 2022 [cited 1 July 2022]. Available from: https://eres.library.adelaide.edu.au/dspace/handle/2440/110348?mode=full
19. Cheragi MA, Manoocheri H, Mohammadnejad E, Ehsani SR. Types and causes of medication errors from nurse's viewpoint. Iran J Nurs Midwifery Res. 2013 May;18(3):228-31.
20. Ayorinde M, Alabi P. Perception and contributing factors to medication administration errors among nurses in Nigeria. International Journal of Africa Nursing Sciences. 2019; 11:100153.
21. Safety Considerations for Product Design to Minimize Medication Errors [Internet]. U.S. Food and Drug Administration. 2022 [cited 1 July 2022]. Available from: https://www.fda.gov/regulatory-information/search-fda-guidance-documents/safety-considerations-product-design-minimize-medication-errors-guidance-industry