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THE SURVEY OF THE RATE AND TYPE OF MEDICATION ERRORS IN ZAHEDAN MEDICAL SCIENCES UNIVERSITY NURSING STUDENTS IN 2016

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Abstract:

Introduction: determining the type and the rate of the medication errors among the nursing students can lead to appropriate suggestions or adopting proper and safe decisions regarding medication in order to prevent medication errors from happening and consequently increasing the health care and safety quality for the patients. Therefore, it was decided to conduct a study aiming at the survey of the rate and type of medication errors among Zahedan medical sciences university nursing students.

Implementation method: the present study is a descriptive research performed on 87 nursing students who were randomly selected in 2016. To collect the information required there was made use of a two-part questionnaire the first part of which was related to demographic characteristics and the second part pertained to the evaluation of the type of the medication errors. Finally, after collecting the questionnaires, the data were analyzed by taking advantage of SPSS 19 and descriptive statistics.

Findings: the individuals’ average age was 21.09 ± 2.48, 51 individuals were women. 24 individuals were studying in term 4, 31 individuals in term 6 and 32 individuals were busy schooling in term 8. Also, 67 students had prior experiences of at least a one-time medication error. The highest mean scores regarding the medication errors were related to “wrong infusion rate”, “wrong injection rate (intravenous drugs that should be injected slowly)” and “non-dilution of the drugs that should be diluted or the incorrect solvent volume”, respectively.
Conclusions: the results of the present study indicated that the medication errors are very common among the students which should be taken into consideration and the officials should be thinking of ways to improve it.

Keywords: medication errors contributory factors, students, Zahedan

Introduction:

Patient safety is one of the most important aspects of health care service providing systems [1]. Medical errors can threaten such a safety and every year medical errors account for the individuals’ mortality more than driving accidents, cancers and AIDS and the officials of health and treatment centers have also acknowledged that medical errors are among the fundamental problems extant in the treatment sector [2]. In recent years, studies on the medication errors due to their effect on the mortality rate rise, patients’ disabilities and hospital costs have shown to be of a great importance [3]. Generally speaking, rapid changes in treatment and health care systems have confronted the professional health care personnel with great many of the ethical issues and problems [4, 5]. Generally, in third-world developing countries, no accurate estimation of the medical and medication errors statistics is available due to the lack of a correct reporting system and the scarcity of the research and scholarly studies, but the experts’ guesses are reflective of the high rate of the occurrence of such errors and the rise in the complains and lawsuits in the courts and judicial referents by the people from the treatment and health care personnel is a document to such a claim [6]. Since medication errors are among the most common extant incidents in the nursing profession the primary and natural result of such errors is the lengthening of the patient’s stay in the hospital and also increase in the costs which sometimes can lead to severe injuries and even patient’s death [7]. In nurse training programs, the university students are trained and informed regarding pharmacology concerning the drugs classifications, mechanism of action, drugs use cases, consumption dosage, drug absorption, effluence, drug metabolism and excretion, time to effect, consumption exception cases, side effects, drug prescription and providing information to the patients and patient’s family in their lessons. Finally, to gain clinical experiences and putting the theoretical information into practical use, the nursing students should undertake to administer drugs in clinical environments supervised by their instructors [8]. Medication errors can occur in various stages of drug administering process including prescribing drugs, taking notes on physician’s orders, drug distribution and allotment, administering drugs to the patients or controlling the drugs [9]. The results obtained by Wolf et al indicated that less than 3% of the nursing students have committed medication errors resulting in injuries to the patients [8]. In Iran, the study performed by
Panjvini in Sanandaj indicated that the medication errors are mostly connected to the omissions and inaccurate dosage [10]. Studies have shown that besides the above cases the patients being diagnosed with several diseases at the same time, pregnant and breastfeeding women and elderly individuals are more exposed to the dangers of medication errors [11]. The determination of the rate and type of the medication errors among the nursing students can lead to the suggestion and adoption of appropriate and safe decisions regarding medication and medicine administration in order for the medication errors to be prevented and consequently an increase in the patient’s safety and health care quality. Therefore, it was decided to undertake a study with the objective of surveying the rate and the type of medication errors in nursing students in Zahedan medical sciences university.

**Implementation method:**

The present is a descriptive research which has been conducted on 87 nursing students who were selected based on a random method in 2016. To collect the information there was made use of a two-part questionnaire the first part of which was related to the demographic characteristics (age, gender and curriculum term) and the second part was connected to the evaluation of the medication error types which had happened to the nurses during the past three weeks. This questionnaire contained 17 items and the respondents were supposed to tick and select the choices which had happened to them. This questionnaire was applied by Rezaee et al in Isfahan [12] and its validity has been confirmed and the questionnaire reliability was obtained 0.91 by taking advantage of Cronbach’s alpha method. To gather the data, after the research plan was ethically confirmed by Zahedan medical sciences university research vice chancellorship a letter of recommendation was acquired and the researcher referred to the faculty of nursing and obstetrics and after making the required coordination arrangements with the faculty educational vice chancellorship firstly the objectives of the current research was explained to the students and after acquiring their oral consent the questionnaires were distributed among them in sufficient number. Of course, the questionnaires were administered to term-8 students in the hospital because they had no theoretical classes at the college. At the beginning of the questionnaire there was inserted a text implying the respondents consent of participation in the present research and it read “your cooperation in the current research plan is taken to mean that you are completely aware of the cooperation terms and conditions and that the information provided by you will remain confidential and you are not exposed to any sort of risks by no means”. After the questionnaires were completed they were gathered and reviewed by the researcher and they were again returned to the respondents in case of existing
incomplete parts and they were asked to complete them. After all of the questionnaires were gathered the data were extracted and analyzed by making use of SPSS 19 and descriptive analysis.

Findings:
The individuals’ average age was $21.09 \pm 2.48$, 51 individuals (58.6%) were women. 24 individuals (27.6%) were studying in term 4, 31 individuals (35.6%) were in term 6 and 32 individuals (36.8%) were passing term 8. Also, 67 individuals (77.0%) had at least committed medication error for one time. The highest medication error mean scores were belonged to “wrong infusion rate”, “wrong injection rate (for drugs that should be injected IV and slowly)” and “administering drugs without diluting them or diluting them with incorrect solvent volume”, respectively.

Students’ medication error type frequency has been inserted in table (1).

Table 1: the frequency of the medication errors type in nurses.

<table>
<thead>
<tr>
<th>Questionnaire related to the type of medication errors</th>
<th>Absolute frequency</th>
<th>Relative frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wrong infusion rate (infusion drugs)</td>
<td>39</td>
<td>44.8</td>
</tr>
<tr>
<td>Administering wrong amount of drug (less or more than the prescribed dosage)</td>
<td>27</td>
<td>31.0</td>
</tr>
<tr>
<td>Administering drugs wrong timing (early or late)</td>
<td>27</td>
<td>31.0</td>
</tr>
<tr>
<td>Administering several drugs simultaneously without paying attention to the medicinal interferences</td>
<td>22</td>
<td>25.3</td>
</tr>
<tr>
<td>Administering drugs without diluting them or diluting them with an incorrect solvent volume</td>
<td>31</td>
<td>35.6</td>
</tr>
<tr>
<td>Administering drugs to wrong patients</td>
<td>27</td>
<td>31.0</td>
</tr>
<tr>
<td>Lack of observing medicinal cautions</td>
<td>25</td>
<td>28.7</td>
</tr>
<tr>
<td>Wrong injection rate (IV medicines that should be injected slowly)</td>
<td>32</td>
<td>36.8</td>
</tr>
<tr>
<td>Application of expired medicines</td>
<td>5</td>
<td>5.7</td>
</tr>
<tr>
<td>Injecting IV medicines subcutaneously</td>
<td>3</td>
<td>3.4</td>
</tr>
</tbody>
</table>
Injecting IV medicines intramuscularly & 5 & 5.7 \\
Injecting IV medicines intravenously & 12 & 13.8 \\
Administering drugs without the physician’s prescription & 8 & 9.2 \\
Ignoring the laboratory specified amounts & 26 & 29.9 \\
Administering sublingual and buccal medicines orally & 11 & 12.6 \\
Not administering the prescribed medicines & 27 & 31.0 \\
Ignoring the patient’s electrocardiogram and heart monitoring & 26 & 29.9

**Discussions:**

The results obtained in the present study indicated that 77.0% of the nursing students had at least a one-time medication error. In the study performed by McCarthy et al 48.5% of the nursing students reported that they had committed medication errors at least for one time [13]. Making mistake is an integral part of human life, since many of the errors stem from the same psychological natural processes and behavioral adaptations which shape the correct behavioral skills. The results obtained by some of the researches have shown that the presence of instructors in the department and hospital sections in some of the cases influence the medication errors prevention positively in nursing students [14]. Therefore, it is suggested that the instructor should be present at the time for administering medicines alongside the student and to exert the maximum level of supervision and monitoring. Also, the senior students can be asked to be present beside the junior students at the time for drug administration. Enlarging the pharmacology lessons can be used as an effective strategy to reduce the medication errors [14].

Also, the results indicated that the highest mean score regarding the type of medication error belonged to “wrong infusion rate”, “wrong injection rate (for the IV medicines that should be injected slowly)” and “not diluting the drugs or diluting them with inaccurate solvent volume”, respectively. In the study conducted by Kouhestani et al it was shown that the most common medication errors committed by the students were: wrong dosage (22.03%), wrong medicine (20.33%) and wrong infusion rate (18.64%) [14]. In the study conducted by McCarthi et al it was indicated that the most common medication error committed by the nursing students was forgetting to administer the medicine (79%) [13]. The results obtained in the study conducted by Shams in the city of Khoy hospitals also were indicative of the highest frequency of the medication errors which belonged to medicinal interferences and wrong infusion rates [15]. In the study conducted by
Kaushal et al., 61% of the medication errors could be accounted for by IV injections [16]. The medication error side effects regarding the intravenous injections are higher in comparison to the other methods of medicinal injections, even there are reports indicating the occurrence of severe injuries and even death consequent to the intravenous injection errors for instance wrong medicine, wrong dosage and incorrect dilution volume and rate [17]. Medication errors can happen in any of the stages in drug prescription to distribution and administration; since prescribing drugs for the patients is a very complicated process and it necessitates awareness, decision making and correct practice and performance [18]. The nurses are considered as one of the most important resources in medical system in which the quality of their performance has a profound impact on the quality of providing medical services and can also be effective in improving patients’ health [19-24]. The problem of medication errors has always been accompanied with the nursing students. However, the emergence of medication errors from the students’ part is an inevitable issue and it is not possible to completely get rid of it. Trying to reduce or control such errors depends on the use of a systematic approach to survey the contributory factors and elimination of such factors to the maximum extent possible, also to design a system for increasing the number of reporting cases by the nursing students. The instructors should be able to provide for safe and appropriate conditions for medication errors reporting by the nursing students.

Conclusions:

The results obtained in the present study indicated that medication errors are very common among the students and it is a warning sign in need of being taken into close consideration and the authorities should take measures towards improving it. By taking advantage of the results obtained in the current research and the survey and analysis of them the students’ weak points or the weak points in the education system can be figured out and then steps can be taken to resolve them and the instructors can prevent such medication errors and their outcomes, usually negative, from happening through modifying and changing the teaching and training process and by applying more precise supervision and control.

Acknowledgement

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