

Knowledge, Attitude and Practice of Nurses towards Errors Associated with Intravenous Medication Administration in Pediatric Hospital-Omdurman Medical Corps- Khartoum State, Sudan

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Abstract: Medication error (ME) define mission, un authorized, wrong dose, wrong route, wrong rate, wrong dosage form, wrong time, wrong preparation and incorrect administration technique Intravenous medications have saved the lives of millions of patients. However, partly because of the huge number of doses and the number of different medications given daily, errors in IV medication administration still represent a significant health care problem in Sudan today. The most frequent. Intravenous medication administrations errors were wrong dose, wrong time and omission dose. This descriptive hospital based study was conducted among nurses staff in pediatric hospital aimed at assessing the knowledge and attitude of nurses towards errors associated with pre-during and post administration of intravenous medication and to identify the most common mistakes regarding the preparation of intravenous medication at Omdurman Military Hospital, Khartoum State, Sudan during the period from (April to July 2013). For the purposes of this study the primary data was collected using observational check list designed from general guideline of the pre, during and after administration of intravenous medication, and also self administer questionnaire. The sample of this study consisted of 100 nurses from both males and females. Secondary data was obtained from references, books, previous studies and from the internet. Collected data was analyzed using Statistical Package for Social Sciences (SPSS) programs and results were presented in frequencies and percentages tables and figures. Results showed that 48% of nurses working for more than one shift, (74%) stated that only one nurse is responsible for more than 4 patients, is a good a continuous communication with physicians (96%), there is no errors in administration intravenous medications (82%). The study concluded that the majority of respondents nurses had a good knowledge about errors associated with pre administration of intravenous medication, but their attitude towards intravenous pre, during and post administration is negative, in addition the practice of nurses is poor specially when regarding during and post administration instructions or guides. The study recommended that intensive regular awareness training programs should be held for nursing staff to prevent intravenous administration errors, the label on any drugs ampoule or syringe should be read carefully before a drug is drawn up or injected.

1. Introduction

1.1 Background

Medication error (ME) define mission, un authorized, wrong dose, wrong route, wrong rate, wrong dosage form, wrong time, wrong preparation and incorrect administration technique (ASHP, 2001). Medication errors account for almost 20% of in hospital medical injury with errors, during Intravenous infusion accounting for roughly 56% of this error. (Monegain B. et l., 2009). Patient age is the most important risk factor for medication administration errors (MAES) as recent evidence from us indicated potentially harmful (MAES) may be there time more common in pediatric population than among adult this suggests the epidemiologic characteristics of error may be different between adult and children (Leyton A, et al., 2008). 14-17% of drug administration of patients errors have negative impact that result in serious harm to patient and distressing not for individual or family but also staff and organization (Jonos et al, 2009).

Children and adolescents are at greater risk three times more common than adults for ME because they have immature physiology and developmental limitations that affect their responsibility to communicate another important factor

determining pediatric dosages can be complicated and need to calculate the child's weight (Otero, 2008).

1.2 Problem Statement

Patient safety and the World Health Organization (WHO, 2010) estimated medical errors quanted to be in the region of 5-18% per hospital admission in the develop world (WHO, 2010). The institute of medicine (IOM) of national academic committee on identifying errors estimated that at least 1.5 million preventable adverse drug event (ADEs) occur each year in USA, 44,000 to 98,000 death per year, are related to mistake made by health care workers, adverse drug event, are among the most common type of health care 2 errors, 1% of all drug event were fatal, 12% life the rating 30% serious, 57% were significance (IOM, 2006).

In France in 2005 in pediatric hospital study , 192 (36%) was wrong route, (10%) wrong dose, (15%) unordered drug, omission 5%, wrong preparation administration 3% (Prot S. et al., 2005). In Ethiopia in 2010 of pediatric in hospital, total of 218 observational study carry out, 89.9% MAEs were identified, 90.8% of these error occurred with I.V bolus medication, 8.2 oral medication (TJFR, 2010). In Sudan in cross sectional study in different health setting at Wad Medani Hospital sample consisted accompanied by instruction to the patient, 14% contained potential infraction 52.6% were free from error (Yousif, et al., 2009)

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1.3 Justification

Medication administration errors occur frequently and are more likely to result in serious harm and death than other types of medication errors. Direct observational studies in hospitals have produced estimates of administration error rates of around 19–27% [3–6] of drugs administered to patients. Errors can have negative impacts for both patients and nurses. A small proportion of errors will lead to serious patient outcomes and even minor errors can leave long-lasting effects on the nurses involved (Han et al, 2005).

Intravenous medications pose particular risks because of their greater complexity and the multiple steps required in their preparation, administration and monitoring. Relatively few studies have specifically focused on intravenous medication administration errors, but those available confirm their high error rates. Serious patient outcomes are over-represented among intravenous medication administration errors compared with other adverse incidents (Han et al, 2005).

1.4 Objectives

1.4.1 General Objective

To assess knowledge and attitude of nurses towards errors associated with administration of intravenous medication in pediatric Hospital- Omdurman medical corps- Khartoum Sudan.

1.4.2 Specific Objectives

- To identify the most common mistakes regarding the preparation of intravenous medication
- To detect nurses errors concerning administration of intravenous medication.
- To evaluate nurses attitude regarding post administration of intravenous medication.

2. Material and Methods

2.1 Study Design

This descriptive observational complete coverage hospital-based study was conducted among nursing staff in pediatric hospital aimed at assessing the knowledge and attitude towards errors associated with intravenous medication administration at Omdurman Military Hospital, Khartoum State, Sudan during the period from (April to July 2013). This is an observational complete coverage hospital- based study

2.2 Study area

The study was carried out at Omdurman Military Medical Corporation-Pediatric hospital locality at the Khartoum state, Sudan. The hospital was established at 2000, services all children of soldiers and officers in addition to civil children.

In pediatric hospital there are four general wards with 59 beds, emergency ward, malnutrition ward, two private wards, in addition to laboratory, pharmacy, and emergency clinic.

The manpower of pediatric hospital is shown in the following table:

Occupation	Number
Physicians	54
Nurses	109
Laboratory technicians	14
Pharmacist	18
Health assistants	24
Nutritionists	6

Source: Statistical Department at Omdurman Military Hospital, Pediatric Hospital (2013).

2.3 Study Population

This study carried out among nurses in Pediatric hospital- Omdurman Military Medical Corporation Khartoum State, Sudan in the period from April to July 2013

2.3.1 Inclusion criteria

100 nurses in Pediatric Hospital at -Omdurman Military Medical Corporation, Khartoum State, Sudan.

2.4 Sample size

The sample size was consisted of all available nurses (complete coverage) (100) who agreed to participate in this study, where 9 nurses were not available during the study period.

2.5 Data tools

Check list was designed from general guideline of the pre, during and after administration of intravenous medication, and also self administer questionnaire was used.

2.6 Data collection

Data was collected by researcher during the period from April to July 2013 by direct observation technique and self-administer questionnaire.

2.7 Data analysis

The collected data was analyzed using Statistical Package for Social Sciences (SPSS) program, results were presented in frequencies and percentages tables and figures.

3. Discussion

The results revealed that majority of respondents were with relatively high qualification (80%) with experience years more than 4 years (64%) which of course will reflect on their job performance.

Also results showed that 48% of nurses working for more than one shift and in half of these shift (50%) there was only one nurse, also results revealed that the majority (74%) stated that only one nurse is responsible for more than 4 patients, Many hours of working, in addition to few nurses in the shift may result in decreasing of nurses concentration so they may be exposed to mistakes during preparing or administrating intravenous medications.

This is similar to Griffiths et al (2013) Research which demonstrates that registered nurses staffing levels on hospital wards affect the ability of staff to deliver care well. Where staffing levels are low, care is compromised. An excessive number of patients per RN is associated with a higher than expected mortality rate and other harms. Results showed that there is a good a continuous communication between physician and nurses when giving clear written medication instructions (96%) to avoid mistakes in a few emergencies cases doctor may give medication instructions orally. Also the study revealed that miss doses is mainly due to the unavailability of medication at the administration time (64%), or said it is due the un-renewing of medication instruction by the physician (36%).

Also the majority of respondents stated that there is no errors in administration intravenous medications (82%). This is similar partially to the study of Anselm et al (2007) which revealed that When preparing medication, wrong patient error did not occur in any of the three hospitals, whereas omission dose was the most frequent error in all study sites. When administering medication, the most frequent errors in the three hospitals were wrong dose and omission dose. The study also revealed that the majority of respondents nurses had a good knowledge about pre administration of intravenous medication preparations, regarding checking the physician order, name of medication, right dose medication, time of dose, expire date, Right diluents. So their attitude towards these items is positive. But on the other hand practicing of hand washing pre-administration is very poor or either not done at all which of course will expose both patients and nurses to many serious health hazards.

In addition, the attitude and practice of nurses during administration is relatively poor when regarding flushing with saline before administration, also a considerable percent of respondents do not care about explaining procedure to client or parents, or asking colleague to double check, but there are apposite attitudes towards check patient identification and accurate dose administer. Also the study showed that the majority of respondents do not care about the important post administration procedures such as hand washing (only 3% concern about washing their hands post administration), Discard the needle and syringe in sharp wastes container (only 14% done it properly), in addition only 46% of respondents care about Assessing the client for side effects. It can be concluded that the attitude towards intravenous pre, during and post administration is negative, in addition the practice of nurses is also inadequate specially when regarding during and post administration instructions or guides.

4. Conclusion and Recommendations

4.1 Conclusion

Intravenous medications have saved the lives of millions of patients. However, partly because of the huge number of doses and the number of different medications given daily, errors in IV medication administration still represent a significant health care problem in Sudan today. The most frequent **Intravenous medication administration errors** is were wrong dose, wrong time and omission dose. Many

mistakes occurs as a results of work overload as a results of long working hours, few number of nurses per patients. The majority of respondents nurses had a good knowledge about errors associated with pre administration of intravenous medication preparations, regarding checking the physician order, name of medication, right dose medication, time of dose, expire date, Right diluents.

The attitude towards intravenous pre, during and post administration is negative, in addition the practice of nurses is poor specially when regarding during and post administration instructions or guides.

4.2 Recommendations

- The standardization of infusion concentrations and the units or format used to order or prescribe intravenous medication infusions (such as mcgm/min vs. mcgm/kg/min).
- Simplifying the administration process, with preference for the preparation of intravenous medication in the pharmacy rather than at the ward and Obtaining the maximum benefit from technology in the form of bar codes, computerized order entry, and smart pumps.
- The label on any drug ampoule or syringe should be read carefully before a drug is drawn up or injected; Labels should be checked with a second person or a device before a drug is drawn up or administered, syringes should (almost) always be labeled; and formal organization of drug drawers and workspaces should be used;
- Intensive regular training programs should be held for nursing staff to minimize the errors rates.

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