

The Relationship between Medication Errors with Job Satisfaction of Nurses in Pediatric Ward

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Abstract

Background

Medication errors are known as a preventable cause of idiopathic damage in pediatrics. These errors could entail serious direct and indirect outcomes that often lead to disruptions in the health care system. The present study aimed to determine the relationship between medication errors with job satisfaction of nurses in pediatric ward.

Materials and Methods

This cross-sectional, descriptive-analytical study was conducted on 80 nurses working in pediatric wards in hospitals affiliated with Ahwaz University of Medical Sciences, Iran that were selected by census. The questionnaires of medication administration error and nurses' job satisfaction (Minnesota job satisfaction) by purposive sampling were used for gathering data. Validity and reliability were checked for internal consistency and stability.

Results

Mean nurses' medication errors in pediatric wards for every nurse over a 3-month period was 11.41 ± 11.79 cases, and mean error reporting was 1.97 ± 3.92 cases. Nurse's age ($P \leq 0.01$) and education level ($P \leq 0.03$) were statistically significantly related with medication errors. The findings of job satisfaction of nurses showed that 44.07% of nurses were dissatisfied. However, there was no significant relationship between incidence of medication errors and nurses' job satisfaction ($r = -0.167$, $P = 0.138$).

Conclusion

Compared to the other studies, the incidence of nurses' medication errors was somewhat higher in this study; however, the report rate was low. It is suggested that, by periodic measuring of job satisfaction and identifying factors that have impact on job satisfaction of nurses and also using strategies to resolve existing problems and dissatisfactions.

Key Words: Job satisfaction, Medication error, Nursing, Pediatric.

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1- INTRODUCTION

All adverse drug events (ADEs), adverse drug reactions (ADRs), and medication errors (MEs) fall under the umbrella of medication misadventures. An ADE refers to any injury caused by a medicine. A ME is any preventable event that has the potential to lead to inappropriate medication use or patient harm; many occur during prescribing, transcribing, dispensing, administering, adherence, or monitoring a drug (1, 2). Their prevention involves the entire health team, particularly the nursing team, being the main body responsible for the drug preparation and administration (3). Medication error is considered to be any avoidable event that actually or potentially interferes inappropriately in the medication process and may provoke patient damage (4). Children are more susceptible to medication errors than adults. Medication administration process is the last stage in the medication treatment process and most of the errors are detected in this stage. Little research has been undertaken about medication errors in children in the Middle East countries (5).

Children, more than adults are exposed to medication errors due to the need to administer medication according to their weight (that needs to be accurately calculated), immaturity of physiological response buffers, higher likelihood of decimal points errors (10 times the prescribed dosage), the need to dilute drug solutions, and limited communication skills to report drug side-effects and symptoms. Also, children's metabolism is different from adults, and their nervous systems and bones are rapidly growing. Therefore, possibility of more severe outcomes is higher. It has been reported in some studies that the rate of errors incidence in children is three times higher than in adults (6-8). Despite the awareness that children are at increased risk for medication errors, little is known about the

epidemiology of these errors and where the gaps remain in our present knowledge (9). Furthermore, drug administration in children is different from that of adults, and errors due to dosage leads to serious harm to children (10). Pediatric wards medication errors are different in different studies, due to variation in the concept of medication error and variations in pediatric wards. These errors vary from 4.2 to 30% (11). Approximately 200,000 children (17 years old or younger) visit emergency departments each year because of adverse drug events. Children less than 5 years old are more likely than older children to visit the emergency department for an adverse drug event, and each year one in every 150 two-year-old visits an emergency department for a medication poisoning (12). According to the MEDMARX data report of 2006-2007, approximately 32.4% of medication errors occurred in pediatric patient compared with 14.6% in the adult population and 15.4% in geriatric patient (13). According to the available statistical data, more than 50 medication orders are administered by a nurse in a single shift (14, 15), and it accounts for about one-third of the nurses' work time (16).

For instance, based on the results of a study in a hospital, the prevalence of medication errors among nurses was 79% (17, 18). On average, nurses spend 40% of their time in the hospital to give medicines to the patients and based on the previous studies, the rate of serious damage to patients owed to medication errors vastly oscillates between 1-2% and 51.8% (17, 19). Though the majority of research has focused on adult patients, studies on medication errors and adverse drug events (ADEs) have also established the importance in pediatrics (20). A study by Parihar and Passi (2008) revealed that of 457 errors identified in 1,286 children, medication errors were 313 (68.5%) (21). Because of the reports of medication errors in children and severity of harm to them,

medication errors in children is a major concern, and despite knowing children's vulnerability to drug errors, only a few studies have been conducted in this area (20). It is believed that one of the ways to know about factors associated with medication errors is reporting them (22); while nurses have estimated that only 25 to 63% of medication errors are actually reported (23). Although medication error reporting alone will not improve patient safety but rather is the first step in a continuous quality improvement cycle (24). Since medication administration is the most important role of nurses, recurring mistakes and errors in this field are more considerable and also have adverse consequences for patients. However, nurses have a very important role in preventing errors as well as reporting them. Hence, standard protocols and sufficient knowledge are needed for safety of the medication administration process (25, 26).

Job satisfaction seems to affect nurses' caring performance and patient safety. Job satisfaction is important to study for two reasons: first, the human aspect that means employees deserve to be treated fairly and respectfully; second, the behavioral aspect that means consideration of job satisfaction, can lead employees to behave in a manner that affects their function and organizational duties and helps them to show positive behavior (27). On the other hand, job satisfaction is a very important part of nursing life that could affect patient's safety, staff morale, performance and usefulness, quality of care, organizational commitment, and efforts for recruiting new manpower (28). In hospitals where nurses have high levels of job satisfaction, quality of nursing care is higher. Conversely, job dissatisfaction is highly associated with increased work pressures on nurses, and work overload is associated with higher mortality rates of patients (29). In all this, medication errors

are a key link in the chain between nursing resources and patient safety (30). Nurses' job satisfaction is a prerequisite for providing quality care. In other words, one of the influential factors in quality of care is satisfaction of those who have the most relationship with patients, and these professional people are the nurses. Job satisfaction is an important part of nurses' life that through increased sense of responsibility and commitment, could affect patient's safety, morale and encouragement of nurses, and efficiency and quality of care. Given that various studies have been conducted on nurses' medication errors and their job satisfaction, to the best of our knowledge, limitation on studies in this field, especially in our country on the relationship between those two cannot be found. Thus, the present study aimed to determine the relationship between medication errors with job satisfaction of nurses in pediatric ward.

2- MATERIALS AND METHODS

2-1. Study design and population

This cross-sectional, descriptive analytical study was conducted to determine the relationship between nurses' medication errors in pediatric wards with their job satisfaction. Study subjects comprised all pediatric ward nurses (80 nurses) working at hospitals affiliated with Ahvaz (Golestan, Shafa, Razi, Abuzar, Sina), Jundishapur University of Medical Sciences (AJUMS), Iran, that were selected by census.

2-2. Measuring tools

Data were collected using medication errors and Minnesota job satisfaction questionnaires. The first questionnaire was related to medication errors and its reports, which had been used in previous studies (31), and consists of two parts. Part one relates to demographic details including type of shift work (rotating, fixed), type of

employment (official, based on contract, employed on contract, serving), and type of ward (pediatrics emergency, pediatric surgery, pediatric infectious disease). The second part consisted of 24 statements about medication errors and related reports by nurses collected over the previous three months. In this part, nurses wrote down the number of actual incidents and reports for each statement in columns titled 'number of incidents of medication error' and 'number of medication errors that were reported'. In other words, to report number of medication errors Open-ended numerical questions were used. The second questionnaire related to nurses' job satisfaction had been derived from the Minnesota job satisfaction questionnaire (MSQ), which is one of the most reliable tools in this field, was developed Weiss et al. (32), and we used the Persian version in this questionnaire (33). This questionnaire contains 20 items about people's work status, which was marked using Likert scale from strongly satisfied (5), satisfied (4), no comment (3), dissatisfied (2), to strongly dissatisfied (1).

Scores ranged from 1 to 5, and higher scores indicated higher job satisfaction. Tools used in this study had also been used in other studies, thus, their validity and reliability have already been confirmed (34-37). After being edited by fellow researchers and the consulting statistician, the questionnaire was reviewed by 19 board faculty members from School of Nursing and Midwifery at AJUMS with expertise in the field. The comments helped the researchers to amend the tool and the revised version was confirmed. To confirm the questionnaire's reliability, internal consistency was calculated using correlation coefficient (Cronbach's alpha = 0.79).

2-5. Ethical consideration

Objectives of the study and their importance were explained to participants,

and informed written consent was obtained from them. Questionnaire was issued to nurses and necessary explanations were given. Through self-reports, at the time and place where they felt secure, nurses completed the questionnaire. Two days later, as per prior agreement, the researcher personally collected completed questionnaires. Study commenced after approval of the proposal and confirmation of the ethics committee of the university.

2-6. Inclusion criteria

Study inclusion criteria were a minimum of Bachelor's Degree, working in pediatric wards (surgery, orthopedics, infectious diseases, and emergency) at hospitals affiliated to AJUMS, and at least 6 months of work experience

2-7. Data Analyses

Data were analyzed using descriptive statistics, one-way variance, and Chi-square tests. SPSS-16 software was used in this study. Independent-samples t-test was used to compare the mean of the two societies and the variance analysis was used to compare several societies. Also, the Pearson correlation coefficient for quantitative and qualitative variables was used.

3- RESULTS

According to the results, all participating nurses were female, majority were married (72.5%, n=58), and educated to the Bachelor's Degree (97.5%, n=78). More than half of the nurses were under 30 years old (52.5%, n=42), and most (85%, n=68) worked shifts in one or more hospitals, doing overtime (76%, n=60). Over one third of nurses (37.5%, n=30) were in contractual employment, and only 1.3% had jobs other than nursing. Nearly half (41.2%, n=32) had undergone drug administration training courses, (47.5%, n=38) had less than 5 years of nursing experience, and (45%, n=36) had worked

in pediatric wards less than 1 year. **Table.1** presents more details. Based on the findings, the mean number of medication errors self-reported in pediatric wards by each nurse was 11.4 ± 11.79 cases (during the previous three months), and that of

error reporting was a mean of 1.97 ± 3.24 cases. This mean that the nurses acknowledged that they made on mean 11.4 ± 11.79 medication errors per 3-month period but reported only 1.97 ± 3.24 of error cases.

Table-1: Frequency distribution of demographic characteristics of nurses.

Variables	Sub-group	Number	%	P-value	
				Medication error	Job satisfaction
Age, year	<30	42	52.4	0.014	0.153
	30-40	31	38.8		
	>40	7	8.8		
	Total	80	100		
Degree of education	Bachelor degree	78	97.5	0.037	0.962
	Master degree	2	2.5		
Gender	Female	80	100	0.065	0.091
	Total	80	100		
Interest in the profession	Yes	51	63.8	0.182	0.009
	No	29	36.3		
	Total	80	100		
Nursing work experience, year	<5	38	47.4	0.098	0.093
	5-10	21	26.3		
	>10	21	26.3		
	Total	80	100		
Work experience in pediatrics ward, year	<1	36	45	0.119	0.092
	1-3	21	26.3		
	>3	23	28.7		
	Total	80	100		
Type of duty allocation in the ward, number	Functional	7	8.7	0.195	0.642
	Case method	52	65		
	Team work	21	26.3		
	Total	80	100		
Type of shift, number	Rotating	68	85	0.268	0.854
	Fixed	12	15		
	Total	80	100		
Type of employment, number	Official	18	22.5	0.811	0.089
	Based on contract	18	22.5		
	Employed on Contract	30	37.5		
	Serving	14	17.5		
	Total	80	100		
Employment in fields other than nursing, number	Yes	1	1.3	0.272	0.057
	No	79	98.7		
	Total	80	100		
Employment in one or more hospitals and working extra hours, number	Yes	4	5	0.06	0.05
	No	76	95		
	Total	80	100		
Formal training in drug administration, number	Yes	33	41.3	0.037	0.103
	No	47	58.7		
	Total	80	100		
Income	Optimal	3	3.8	0.410	0.861
	Medium	50	62.5		
	Undesirable	27	33.8		
	Total	80	100		

Table.2 shows the mean number of medication errors and reports of these errors. The results indicated that age of nurses was significantly related to incidence of medication error, so that their errors reduce with aging, and one-way analysis of variance showed this relationship was significant ($P \leq 0.05$). Also, mean incidence of medication error was lower in nurses with Master's degrees than those with Bachelor's degrees, and using Chi-square test, the difference was significant ($P \leq 0.05$). There was a linear

relationship between drug administration training course and medication errors, so that those who had undergone the course committed less medication errors. However, this relationship was not significant according to Chi-square test. The results obtained from one-way analysis of variance, showed no significant relationship between nurses' medication errors and nursing work experience, work experience in pediatric wards, working shift, type of employment, and task assignment ($P > 0.05$).

Table-2: The mean nurses' medication errors and reports in Pediatrics ward

Medication error	Errors made Mean \pm SD	Errors reported Mean \pm SD
Not administering a prescribed drug to the patient	0.47 \pm 1.09	0.30 \pm 0.93
Administering drug without doctor's orders	1.42 \pm 2.65	0.50 \pm 1.50
Administering drug before or after appointed time	2.26 \pm 3.58	0.26 \pm 0.79
Not diluting drug which must be diluted	0.13 \pm 0.61	0.03 \pm 0.33
Inappropriate time (before/after meal) for administering drug	0.58 \pm 1.83	0
Not taking necessary steps (e.g., determining pulse, BP, etc.) regarding particular drugs	0.53 \pm 1.69	0.05 \pm 0.35
Mixing two or more drugs in micro set without considering interactions	0.91 \pm 1.76	0.07 \pm 0.34
Infusing drug faster than should be infused.	0.46 \pm 1.15	0.08 \pm 0.45
Subcutaneous injection of intravenous drug	0.01 \pm 0.11	0.01 \pm 0.11
Intravenous injection of subcutaneous drug	0.01 \pm 0.11	0.01 \pm 0.11
Intravenous injection of intramuscular drug	0.07 \pm 0.47	0
Intramuscular injection of intravenous drug	0	0
Excessive intramuscular drug injection to a child	0.01 \pm 0.11	0
Intramuscular injection regardless of child's age	0.03 \pm 0.19	0.01 \pm 0.11
Miscalculation of dose of prescribed drug or electrolytes	0.17 \pm 0.63	0.08 \pm 0.39
Administering several oral drugs simultaneously	2.15 \pm 3.96	0.01 \pm 0.11
Administering painkiller without doctor's order	0.08 \pm 0.42	0.08 \pm 0.42
Administering the wrong drug	0.05 \pm 0.31	0.05 \pm 0.31
Administering drug more/less than prescribed dose	0.11 \pm 0.47	0.07 \pm 0.41
Administering drug without a defined route	0	0
Administering drug to wrong child	0.1 \pm 0.51	0.01 \pm 0.11
Administration of oral drugs to a child approximately	0.52 \pm 1.57	0.01 \pm 0.11
Lack of control of sensitive drugs (Digoxin, Anticoagulants, Insulin) by two nurses	1.16 \pm 2.94	0
Not considering appropriate position of patient based on type of drug	0.1 \pm 0.64	0

The findings of job satisfaction of nurses showed that, 44.07% of nurses had dissatisfied, 22.5% had satisfied, 22% had no comment of job satisfaction and only 3.4% had very dissatisfied and 8% had very satisfied as job (**Table.3**) (Please see the table.3 in the end of paper). In regard to the relationship between job satisfaction and demographic variables, the variables only had significant relationship with

interest in the profession (P=0.009), and employment in one or more hospitals and working extra hours (P=0.05) (**Table.1**). There was inverse linear relationship between medication errors and nurses' job satisfaction (r= -0.167). However, this relationship was not significant (P=0.138) with increasing mean job satisfaction, nurses' medication errors decreases (**Table.4**).

Table-4: Pearson correlation between two variables- job satisfaction and medication error.

Variable	Job satisfaction	
	Pearson correlation	P=Sig(2-tailed)
Medication errors	-0.167	0.138

4- DISCUSSION

This study aimed to investigate the relationship between incidence and report of medication error and job satisfaction in Pediatric ward in Ahwaz, Iran. Nurses' job satisfaction is one of the requirements for the quality of care, and its constant monitoring is a useful tool to facilitate the development of the related organizations. Results showed that medication errors in hospitals affiliated with Ahvaz are fairly common but that of error reporting was relatively low. Also, based on the findings of this study, more than half of the nurses had low job satisfaction and a small number of nurses had high and very high job satisfaction. The study results showed with increasing mean job satisfaction, nurses' medication errors decreases. According to the results, the mean number of medication errors in pediatric wards for each nurse was 11.41 ± 11.79 cases during 3 months. Alsulami et al. (2016) found 63 medication preparation and administration errors were identified with error rate 13.8% of medication administrations (5). In a study by Kingston (2011) 50 out of 54 participating nurses had committed

medication errors, while 34 nurses had not paid any attention to reporting errors that had occurred (22). There are differences in rates of pediatric medication errors in existing studies. This is due to the difference in the meaning of medication error, difference in wards studied (general, ICU), data collection method as well as the existence of reporting systems. Published reports show medication errors range from 4.2 to 30% (11). Because of the mentioned reasons estimating incidence of pediatric medication errors is even more. In the current study, medication errors have a wider definition than the previous studies, which can be the cause for the difference in rates of these errors compared to other studies. Results of the present study indicate a lower rate of errors in pediatric wards compared to that in adult wards in Iran (31), which could be due to more sensitivity, accuracy, and training of nurses in pediatric wards compared to adults. While studies in western countries reveal lower rates of errors in adult wards compared to pediatric wards (38). This is thought to be due to more risks taken in pediatric wards compared to those of

adults, and children's cognitive and emotional responses following medication errors. However, it is still unclear whether pediatric nurse's experiences in relation to medication errors and reporting them, are different from experiences of nurses in adult wards (22). The Joint Commission Sentinel Event Alert investigated the difference in pediatric and adult drug administrations in April 2008, which followed special interventions for safe administration of drugs to children (10).

The results showed mean reports of medication errors for each nurse in the studied wards was 1.97 ± 3.92 cases during 3 months, which means only 17.28% of errors had been reported by nurses, and this rate of reporting is lower than in similar studies conducted on adults and children. In Stratton et al.'s study (2004), 67% of medication errors in pediatric ward had been reported (38). It is likely that more complex methods and processes in pediatric wards had influenced reporting of errors, this requires further studies.

Also, in Iran there is not a standard system of documentation and medication error reporting. There are special circumstances related to the physiological and emotional development of children that pose a different type of risk involving medication errors as compared with adults. Knowledge of this greater risk may promote more vigilance and more reporting (38). Since medication use and the types of errors that occur in children are different from adult patients, interventions to prevent errors must also be different (39). Use of computer systems for entering medical orders, suitable and competent pharmacy staff, policies on verbal orders, clear medicine stickers, health professionals' access to information and clinical resources, patients' training about drugs, and standardizing equipment (pumps, scales), are methods to reduce medication errors in pediatric wards (40). In this study, there was a linear

relationship between nurses' medication errors and undergoing drug administration training courses, which reduced nurses' medication errors. However, this relationship was not statistically significant. The small sample size in this study could be a possible reason for this, and perhaps, different results could be obtained by increasing the sample size. The quality of the medication administration process is also influenced by existence of continuing education programs for nursing staff (41), and patients' safety can improve by constant training of nurses (22, 42) because knowledge is a key protective factor against medication errors (42). In training courses, nurses are introduced to a variety of new drugs, how to use pumps, and how to accurately calculate doses, which could have a considerable impact on reducing medication errors.

Findings of this study revealed a significant relationship between nurses' medication errors in pediatric wards and their age, so that younger nurses committed the most medication errors, and medication errors reduced with aging. Younger nurses, also have less work experience compared to older nurses. Some studies have shown that low experience and being novice are the most important factors in incidence of medication errors (43). Nursing team members' supporting each other and creating a system of support by more experienced nurses for novice nurses could be a suitable strategy to reduce medication errors (23, 34). In the present study, mean number of nurses' medication errors was lower in nurses with Master's degrees compared to those with Bachelor's degrees, and this difference was found significant using Chi-square test. Calculating medication doses, using mathematical methods in pediatric wards is an important nursing skill needed for drug administration. Various studies have

indicated the effect of nurses' education level on calculation of doses and incidence of drug errors (44); so that, errors decrease with higher education level in nurses. Thus, it is recommended that nursing schools stress on medication calculations, and an ethical responsibility of schools is not to permit graduation until students are fully conversant in drug administration (45). While the study results showed a decrease in medication errors with increased job satisfaction (27), there was no significant statistical relationship between pediatric nurses' medication errors and their job satisfaction. Studies conducted in Canada revealed a relationship between medication errors and factors such as job security and job satisfaction (46). In hospitals where nurses have higher job satisfaction, nursing care is provided with a higher quality. In other words, higher quality of nursing care usually follows higher levels of job satisfaction (47). Research carried out in the past two decades clearly indicate a specific relationship between nurses' medication errors and lack of manpower and low job satisfaction of nurses, and enhanced job satisfaction reduces medication errors (48). Since, any person with work incentives can better offer his services, having job satisfaction in nurses is an important issue that leads to enhanced quality of services provided by nurses.

4-1. Study Limitations

Since, in this study, data of medication errors were collected self-reportedly, the answers to the questionnaires might have been influenced by several factors such as fear of revealing personal data, punishment, change in colleagues' behavior, overestimated self-assessment and downgrading. The nurses still expressed doubts regarding the confidentiality of the results, which made the work more complicated. The researchers' good communication with the

participants in addition to knowing the research environment helped ensure trust with the nurses.

5- CONCLUSIONS

Compared to the other studies, the incidence of nurses' medication errors was somewhat higher in this study; however, the report rate was low. Therefore, nursing managers and healthcare providers should identify systematic causes of those errors and apply strategies to reduce the incidence of them as well as utilizing mechanisms to encourage reporting the actual errors. Therefore, it is recommended that studies be conducted in relation to barriers to reporting from the perspective of nurses in pediatric wards. Also, the authors suggest that, by periodic measuring of job satisfaction and identifying factors that have impact on job satisfaction of nurses, and also using strategies such as creating opportunity for nurses' promotion based on their abilities, improving the culture of society in regard to the importance of nurses and nursing profession, providing facilities and opportunity to update nurses' knowledge and using experienced consultants, could resolve existing problems and dissatisfaction.

6- AUTHORS' CONTRIBUTION

All authors have equally contributed for the concept/design, collection/analysis of data, and preparation/critical revision of the manuscript.

7- CONFLICT OF INTEREST: None.

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9-REFERENCES

1. VA Center for Medication Safety And VHA Pharmacy Benefits Management Strategic Healthcare Group and the Medical Advisory Panel. Adverse Drug Events, Adverse Drug Reactions and Medication Errors Frequently Asked Questions. 2016:1-4. Available at: <https://www.pbm.va.gov/PBM/vacenterformedicationsafety/tools/AdverseDrugReaction.pdf>.
2. Dedefo MG, Mitike AH, Angamo MT. Incidence and determinants of medication errors and adverse drug events among hospitalized children in West Ethiopia. *BMC pediatrics*. 2016;16(1):81
3. Volpatto BM, Wegner W, Gerhardt LM, Pedro ENR, Cruz SdS, Bandeira LE. Erros de medicação em pediatria e estratégias de prevenção: revisão integrativa. *Cogitare enfermagem Curitiba*. 2017;22(1):1-14.
4. Sanitária ANdV. Protocolo de segurança na prescrição, uso e administração de medicamentos. ANVISA Brasília (DF); 2013.
5. Zayed Nama Alsulami AaaAE. Medication administration errors in pediatric ward: An observational study. Conference Series LLC Joint International Event on 7th Pharmacovigilance & Pharmaceutical Industry;Vienna, Austria.2016.
6. Simpson J, Lynch R, Grant J, Alroomi L. Reducing medication errors in the neonatal intensive care unit. *Archives of Disease in Childhood-Fetal and Neonatal Edition*. 2004;89(6):F480-F2.
7. Koren G. Trends of medication errors in hospitalized children. *The Journal of Clinical Pharmacology*. 2002;42(7):707-10.
8. Kaushal R, Bates DW, Landrigan C, McKenna KJ, Clapp MD, Federico F, et al. Medication errors and adverse drug events in pediatric inpatients. *Jama*. 2001;285(16):2114-20.
9. Miller MR, Robinson KA, Lubomski LH, Rinke ML, Pronovost PJ. Medication errors in paediatric care: a systematic review of epidemiology and an evaluation of evidence supporting reduction strategy recommendations. *BMJ Quality & Safety*. 2007;16(2):116-26.
10. Alert SE. Preventing pediatric medication errors. 2008. Available at: http://www.jointcommission.org/SentinelEvents/SentinelEventAlert/sea_39.htm.
11. Aspden P, Wolcott JA, Bootman JL, Cronenwett LR. Preventing medication errors: National Acad. Press; 2007.
12. Prevention CfDCA. Adverse Drug Events in Children 2018. Available at: <https://www.cdc.gov/medicationsafety/parents/childrenadversedrugs.html>.
13. Sandlin D. Pediatric medication error prevention. *Journal of perianesthesia nursing : official journal of the American Society of PeriAnesthesia Nurses*. 2008;23(4):279. Available at: <http://doi.org.10.1016/j.jopan.2008.05.007>.
14. Morris S. Who's to blame? *Nursing*. 1991;4(33):8
15. Oladi Ghadikalae R, Ravaghi H, Hesam S. Study Of Nurses' Perceptions On Medication Errors In Pediatric Hospitals In Tehran, Iran. *Journal of Payavard Salamat*. 2015;9(3):315-28.
16. Izadpanah F, Nikfar S, Imcheh FB, Amini M, Zargaran M. Assessment of Frequency and Causes of Medication Errors in Pediatrics and Emergency Wards of Teaching Hospitals Affiliated to Tehran University of Medical Sciences (24 Hospitals). *Journal of Medicine and Life*. 2018;11(4):299.
17. Madadi Z JE. Nursing Medication Errors, Causes and Solutions. *J of Hospital*. 2015;3(14):101-9.
18. Mirzaei M, Khatony A, Faramani RS, Sepahvand E. Prevalence, Types of Medication errors and Barriers to Reporting Errors by Nurses in an Educational Hospital in Kermanshah. *Hayat*. 2013;19(3):28-37.
19. Jember A, Hailu M, Messele A, Demeke T, Hassen M. Proportion of medication error

reporting and associated factors among nurses: a cross sectional study. *BMC nursing*. 2018;17(1): 9.

20. Miller MR, Robinson KA, Lubomski LH, Rinke ML, Pronovost PJ. Medication errors in paediatric care: a systematic review of epidemiology and an evaluation of evidence supporting reduction strategy recommendations. *Quality & safety in health care*. 2007;16(2):116. Available at: <http://doi.org.10.1136/qshc.2006.019950>.

21. Parihar M, Passi GR. Medical errors in pediatric practice. *Indian pediatrics*. 2008;45(7):586-9

22. Kingston F. "Nurse likelihood to report a pediatric medication error: Examination of the "pre-reporting" period" (2011). . Texas Medical Center Dissertations (via ProQuest) AAI3464803 2011. Available at: <https://digitalcommons.library.tmc.edu/dissertations/AAI3464803>.

23. Chiang HY, Pepper GA. Barriers to nurses' reporting of medication administration errors in Taiwan. *Journal of nursing scholarship : an official publication of Sigma Theta Tau International Honor Society of Nursing*. 2006;38(4):392-9.

24. Sproat B, Miller J. Nursing Measures to Decrease Pediatric Medication Errors. *Nursing*. 2009. Available at: <https://sites.google.com/site/medicalsurgicalnursing211sp09/research-paper-draft/nursing-measures-to-decrease-pediatric-medication-errors>.

25. Baghcheghi N, Koohestani HR. Nursing students' errors in preparation and administration of intravenous drugs. *Strides in development of medical education*. 2008;5(1):43-9.

26. Simonsen BO, Johansson I, Daehlin GK, Osvik LM, Farup PG. Medication knowledge, certainty, and risk of errors in health care: a cross-sectional study. *BMC Health Services Research*. 2011;11(1):175.

27. Bolandianbafghi S, Salimi T, Rassouli M, Faraji R, Sarebanhassanabadi M. Correlation between medication errors with job

satisfaction and fatigue of nurses. *Electronic physician*. 2017;9(8):5142.

28. Bowles C, Candela L. First job experiences of recent RN graduates: improving the work environment. *The Journal of nursing administration*. 2005;35(3):130-7.

29. Best MF, Thurston NE. Canadian public health nurses' job satisfaction. *Public health nursing (Boston, Mass)*. 2006;23(3):250-5.

30. Jordan S. Signposting the causes of medication errors. *International nursing review*. 2011;58(1):45-6.

31. Joolae S, Hajibabae F, Peyrovi H, Haghani H, Bahrani N. The relationship between incidence and report of medication errors and working conditions. *International nursing review*. 2011;58(1):37-44.

32. Weiss DJ, Dawis RV, England GW. Manual for the Minnesota satisfaction questionnaire. *Minnesota studies in vocational rehabilitation*. 1967.

33. Rasoul Azadi HE. The effects of social capital and job satisfaction on employee performance with organizational commitment mediation role) Case Study, Youth and Sports Ministry). *Organizational Behavior Management in Sport Studies* 2016;2(8):11-24.

34. Mrayyan MT, Shishani K, Al-Faouri I. Rate, causes and reporting of medication errors in Jordan: nurses' perspectives. *Journal of nursing management*. 2007;15(6):659-70.

35. Foundation CH. Defining medical error. Addressing medication errors in hospitals Ten tools. 2013:1-40. Available at: <http://www.chcf.org/topics/hospitals/index.cfm?itemID=12682>.

36. Foundation CH. Addressing medication errors in hospitals. Ten tools. 2013:1-47. Available at: <http://www.chcf.org/topics/hospitals/index.cfm?itemID=12682>.

37. Joolae S, Jalili HR, Rafii F, Hajibabae F, Haghani H. The relationship between ethical climate at work and job satisfaction among nurses in Tehran. *Indian journal of medical ethics*. 2013;10(4):238-42.

38. Stratton KM, Blegen MA, Pepper G, Vaughn T. Reporting of medication errors by pediatric nurses. *Journal of pediatric nursing*. 2004;19(6):385-92.
39. Walsh KE, Kaushal R, Chessare JB. How to avoid paediatric medication errors: a user's guide to the literature. *Archives of disease in childhood*. 2005;90(7):698-702.
40. Levine SR CM, Blanchard NR, et al. Guidelines for preventing medication errors in pediatrics. *J Ped Pharmacology and Therapeutics*. 2001;6:427-43
41. Anselmi ML, Peduzzi M, Dos Santos CB. Errors in the administration of intravenous medication in Brazilian hospitals. *Journal of clinical nursing*. 2007;16(10):1839-47.
42. Kendall-Raynor P. Training assessment will address medication and care concerns. 2010; 24 (31): 7. *Nurs Standard* 2010;24(31):7-10.
43. Tang FI, Sheu SJ, Yu S, Wei IL, Chen CH. Nurses relate the contributing factors involved in medication errors. *Journal of clinical nursing*. 2007;16(3):447-57.
44. Wolf ZR, Hicks R, Serembus JF. Characteristics of medication errors made by students during the administration phase: a descriptive study. *Journal of professional nursing : official journal of the American Association of Colleges of Nursing*. 2006;22(1):39-51.
45. Segatore M, Edge DS, Miller M. Posology errors by sophomore nursing students. *Nursing outlook*. 1993;41(4):160-5.
46. Wilkins K, Shields M. Correlates of medication error in hospitals. *Health reports*. 2008;19(2):7-18.
47. Laschinger HKS, Shamian J, Thomson D. Impact of magnet hospital characteristics on nurses' perceptions of trust, burnout, quality of care, and work satisfaction. *Nursing economics*. 2001;19(5):209.
48. Berry L, Curry P. Nursing workload and patient care. *The Canadian Federation of Nurses Unions*. 2012:1-98. www.cfnu.ca.

Table-3: The frequency distribution of nurses' job satisfaction in Pediatrics ward.

Job satisfaction	Very satisfied		Satisfied		No Comment		Dissatisfied		Very dissatisfied	
	Number	%	Number	%	Number	%	Number	%	Number	%
Being busy during the shift	3	3.8	14	17.5	17	21.3	42	52.5	4	5
Having Independence	-	-	17	21.3	3	3.8	55	68.8	5	6.3
Having a variety of work	8	10	19	23.8	18	22.5	33	41.3	2	2.5
Being prominent as an individual in the organization	2	2.5	19	23.8	17	21.3	40	50	2	2.5
Leadership style of my manager	2	2.5	13	16.3	14	17.5	42	52.5	9	11.3
Competent decision makers	7	8.8	20	25	20	25	30	37.5	3	3.8
Possibility of doing things in accordance with ethics	1	1.3	13	16.3	18	22.5	46	57.5	2	2.5
Having job stability	2	2.5	12	15	12	15	51	63.8	3	3.8
Possibility of serving and helping others	-	-	4	5	11	13.8	56	70	9	11.3
Ability to guide people	1	1.3	3	3.8	14	17.5	59	73.8	3	3.8
Possibility to use capabilities in doing things	9	11.3	9	11.3	57	71.3	5	6.3	-	-
Possibility to implement organizational policies in practice	4	5	19	23.8	19	23.8	38	47.5	-	-
Fit the amount of salary with working hours	20	25	34	42.5	9	11.3	17	21.3	-	-
The possibility of progress in the work	11	13.8	34	42.5	20	25	15	18	-	-
Freedom to judge how duties are performed	4	5	23	28.8	30	37.5	23	28.8	-	-
Independence in performing tasks	4	5	11	13.8	21	26.3	42	52.5	2	2.5
Work situation (material facilities and physical conditions); Benefits, bonuses and overtime	28	35	37	46.3	4	5	11	13.8	-	-
How colleagues treat each other	2	2.5	13	16.3	10	12.5	49	61.3	6	7.5
Possibility to reward good work	23	28.8	38	47.5	9	11.3	10	12.5	-	-
I feel the success of my career	7	8.8	17	21.3	28	35	25	31.3	3	3.8
My overall feeling is about my job	3	3.8	21	26.3	16	20	38	47.5	2	2.5
How the Direct Manager behaves with me	3	3.8	11	13.8	19	23.8	42	52.5	5	6.3
How the administrator behaves with other employees	2	2.5	13	16.3	21	26.3	42	52.5	2	2.5