

Investigating the Relationship of Work Errors with Occupational Stress and Perceived Organizational Support Among nurses: A Descriptive Correlational Study

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Abstract

Background: Occupational stress in nurses leads to job burnout and an increase in missed nursing care, and the incidence of work errors. Investigating the factors associated with occupational stress can assist nursing managers in supporting nurses, reducing and handling errors, and adopting appropriate policies.

Objectives: This study aimed to determine the relationship between work errors and stress sources, and perceived organizational support among nurses.

Methods: This was a correlational descriptive study conducted on 160 nurses working at the hospitals of Miandoab City, Western Azerbaijan province of Iran. The nurses were enrolled by the census from April to July 2019. The data collection tool was a 4-part questionnaire for recording demographic information, nurses' sources of stress, perceived organizational support, and nursing work errors. The data were analyzed by SPSS21 software.

Results: Most of the nurses were female (61.8%), had a work experience of fewer than three years (43.75%), and had a bachelor's degree (73.1%). The sources of stress were directly and significantly correlated with nursing errors in the dimensions of drug therapy ($r=0.241$, $p=0.002$), nursing care ($r=0.685$, $p=0.014$), and report writing ($r=0.101$, $p=0.030$). Also, perceived organizational support was significantly and inversely associated with nursing errors in the dimensions of nursing care ($r = -0.190$, $p=0.016$) and drug therapy ($r = -0.182$, $p=0.042$). Sources of stress, along with perceived organizational support, years of service, and the level of education, explained 8% of variations in nursing work errors.

Conclusion: The results of the study showed that an increase in the sources of stress and a decrease in perceived organizational support was related to a rise in work errors among nurses. These two factors, along with years of service and level of education, were among the predictors of nursing work errors. Therefore, it is suggested to pay attention to organizational support and manage stress sources in the work environment to reduce nurses' work errors.

Keywords: *perceived organizational support, clinical nurse, occupational stress, medical errors*

Introduction

Considering the importance of keeping nurses, as healthcare providers, healthy and preventing nursing work errors, it is necessary to identify the

causes of stress for nurses in the hospital work environment in order to decrease their dissatisfaction and prevent them from leaving the job [1]. A logical level of occupational stress is

necessary so that nurses can accomplish their duties; however, if stress trespasses the tolerable level for nurses, it may endanger their health. Therefore, organizations should direct their efforts toward reducing and managing stress in their personnel [2]. Factors such as direct contact with patients and their families, a close working relationship with doctors and other members of the health team, heavy workload, long shift hours, delayed payment of salaries, and working on holidays are among a number of causes of stress in nurses [3].

Le et al. (2015) investigated the role of work stressors and colleague support as the predictors of personal efforts and job performance and highlighted the importance of social and organizational support in improving nurses' welfare and performance, as well as maintaining patient safety and preventing occupational conflicts for the nurses [4]. Since nurses' work environment problems are interrelated with the health and well-being of society and correlate with organizational determinants, the organization's special support for nurses can modify the work environment in a way that encourages nurses to play a more active role, keep their jobs, and feel more committed to the organization, and, therefore, upgrading public health [5]. If nurses receive strong social support from their supervisors and colleagues, they will feel more secure and independent in making work-related decisions, which will increase the employment rate among nurses and upgrade patient safety and nursing care provision [3].

Most often, when work errors happen in the hospital, nurses themselves analyze the situation and decide how to manage the error. Errors can culminate in constructive changes in clinical work only if nurses work in a supportive and no-blame culture, encouraging them to employ appropriate adaptive strategies [6]. Therefore, in order to be able to properly manage medical errors, there has been an emphasis on official and non-official support for nurses to persuade them to, instead of persisting on making errors, struggling with moral conflicts, and, finally, quitting the profession, introduce constructive changes after the occurrence of a work error for the benefit of patients and themselves, which necessitates receiving support from authorities [7].

Reviewing domestic and international databases disclosed to us multiple studies on the incidence and causes of work errors among nurses. In a study by Karimi et al. (2018) study, the reasons for nurses' medication errors include fatigue caused by extra work, shortages in nursing forces, and compacted workload [8]. In another study by Daigle et al. (2018), nurses' rate of medication errors in hospital wards was reported as 28.6% [9]. Also, Ghanbari Afra (2018) designated system errors as the most prominent reason for the occurrence of medication errors and managerial factors as the most common reason for not reporting errors [10]. In Salam et al.'s study (2019), social stressors (familial conflicts, disputes with colleagues), stress due to having limited time to complete the work, and structural determinants (mandatory shifts at night and on holidays) were noticeably associated with medication errors [11]. In another study, Goering et al. (2018) reported an inverse correlation between nurses' occupational stress and their staying at the job, while organizational support can also modulate the retention of nurses in this profession [12]. Nevertheless, we found no study assessing the relationship between sources of stress, organizational support, and the incidence of nursing work errors. Regarding the importance of perceived occupational stress and organizational support in shaping the behaviors of hospital employees, particularly nurses, their organizational commitment, and their staying at the job, the present study was performed to investigate the relationship between nursing work errors with the sources of stress and organizational support among the nurses working in the hospitals of Miandoab city.

Methods

This was a descriptive-cross-sectional correlational study conducted on 160 clinical nurses from April to July 2019. The participants were recruited by the census, and the study population included all nurses working in the Hazrat-e-Fatemeh (pbuh) and Abbasi state-affiliated hospitals of Miandoab city. Inclusion criteria for the participants were to provide informed consent to participate in the study, work as a clinical nurse in one of the wards of the hospitals studied, have at least six months of work experience, not be exposed to stress sources

outside the work environment, not suffering from psychological diseases, and not consuming anti-anxiety medications (based on self-reporting). After obtaining the necessary permissions, the researcher distributed study questionnaires among the nurses working on different shifts and on different days. A phone number was obtained from the participants in case of any additional information was required. Completed questionnaires were recollected during the same or the next shift.

The data were collected via a 4-part questionnaire. The first part was related to demographic information (i.e., age, gender, education level, income, and service history). In the second part, nurses' sources of stress were evaluated using the Challenge-Hindrance Stressor Scale. The Cavanaugh questionnaire consists of 11 items, six of which are related to stressful challenges, and the remaining five items scrutinize stressful sources. These 11 items are scored on a 5-point Likert scale, where the statement "causes no stress" is scored one, while "causes great stress" receives five scores. The range of the scores varies from one to five, with a higher score reflecting more stress [13]. The validity and reliability of this questionnaire have been confirmed previously [14]. In order to verify the content validity of this questionnaire, after direct and back translations of the questionnaire, the tool was provided to a number of the clinical nurses working at the hospitals mentioned, and ten professors of Urumiah University of Medical Sciences, and their corrections were executed. The reliability of the questionnaire was confirmed by calculating Cronbach's alpha coefficient (0.86).

The third part of the tool was the Riggle Perceived Organizational Support Questionnaire. In this study, we used the 8-item short form of this tool, which was scored on a 5-point Likert scale from strong disagreement [1] to strong agreement [5]. The scores ranged from one to five, and higher scores indicated greater perceived organizational support. The reliability of this questionnaire was evaluated by Hashemi et al. (2016) via the internal consistency method, and its Cronbach's alpha coefficient was calculated as 0.76. [10]. In the present study, the reliability of the questionnaire was also affirmed by obtaining a Cronbach's alpha coefficient of 0.84.

The fourth part of the data collection tool included a domesticized nursing work error questionnaire used by Baghaei et al. (2011) [15] and Saki et al. (2016) [3]. In each of the items, the participant is asked if she/he has ever perpetrated a particular error. For example, some queries in the mediation error dimension included: Have you ever administered a wrong drug to a patient? Have you ever concurrently given two drugs (for example, by infusing them into IV normal saline simultaneously) without considering their interferences with each other? Have you ever given a drug to a patient or analgesic without a doctor's prescription? The participant responded to each question with either yes or no. The reliability of the questionnaire was calculated as 82% in the study of Beqaei et al. [15]. In the present study, the reliability of this questionnaire was also confirmed with Cronbach's alpha coefficient of 88%.

Data analysis was conducted in SPSS 21 software. The normal distribution of the data was checked by the Kolmogorov-Smirnov test. Research hypotheses were examined using the Pearson correlation test and multiple regression analysis. Descriptive statistics (frequency, percentage, mean, and standard deviation), Spearman correlation, independent sample t-test, and one-way analysis of variance (ANOVA) were used. The statistical significance level was considered $p < 0.05$.

After acquiring the official approval of the hospital's president, as well as receiving an ethical approval code, the researcher visited the hospitals and wards where the nurses worked. After obtaining informed consent, the research provided the nurses with the questionnaire, which was gathered at a convenient time after being completed.

Results

The nurses' demographic characteristics and their relationships with nursing work errors have been summarized in Table 1. In this study, most of the nurses were female (68.1%); belonged to the age group of 31 to 40 years (51.9%); held a bachelor's degree (73.1%), and had a work experience of fewer than three years (33.1%). The results of the independent t-test, Spearman correlation, and one-way ANOVA showed that there was no significant difference comparing the scores of

nursing work errors in terms of different (Table 1).
subgroups of demographic features ($p>0.05$)

Table 1: The Frequency Distribution of Demographic Variables of 160 Nurses Working in Miandoab Hospitals and their Relationship with Work Errors

Variables		Relative frequency	Percentage	Mean (SD)	P
Gender	Male	52	31.9	(2.52) ± 24.64	t=1.148
	Female	108	68.1	(2.30) ± 25.11	p=0.253
Age (years)	<30	66	41.3	(1.93) ± 24.92	F=2.056 P=0.131
	31-40	83	51.9	(2.65) ± 25.16	
	41-50	11	6.8	(2.29) ± 23.63	
Education	Diploma	38	23.8	(2.35) ± 24.57	F =0.682 p = 0.507
	Bachelor	117	73.1	(2.38) ± 25.09	
	Masters	5	3.1	(2.48) ± 24.80	
Years of service	<3	70	43.75	(2.67) ± 26.40	F= 1.787 p= 0.152
	3-5	42	26.25	(2.15) ± 25.10	
	5-10	28	17.5	(2.44) ± 24.46	
	>10	20	12.5	(2.44) ± 24.83	
Total		160	100		

*; independent t-test, F; one-way analysis of variance, $P<0.05$; statistical significance level

The mean score of stress sources among nurses was 33.90 (4.63), and the stress sources obtaining the highest and lowest scores were the lack of job

security 4.05 (1.12) and occupational red lines 2.40 (0.97), respectively (Table 2).

Table 2: The Scores of the Sources of Stress Among 160 Nurses Working in the Hospitals of Miandoab City

Sources of stress	Mean	SD
I have no job security.	4.0500	1.12042
The area of responsibility that falls into my job position.	3.8562	1.09226
The extent to which politics rather than performance affect organizational decisions.	3.8500	1.08274
A vague understanding of what expectations are from me in my job.	3.7875	1.09537
The pressure I am experiencing during working hours.	3.6375	1.18951
The time duration spent working.	3.3875	1.17086
The number of projects or responsibilities assigned to me.	3.2438	1.24257
The amount of work that I have to accomplish within a specific time.	3.1250	1.26267
The responsibilities that I have.	2.4313	.74919
The red lines that need to be fulfilled so that I can go to work.	2.4062	.97321
The total score of sources of stress	33/90	4.63

Regarding perceived organizational support, the mean total score was obtained as 30.38 (7.83), with the highest (5.08 ± 1.03) and lowest (1.85 ± 1.14) scores being related to the

organization's giving priority to the nurse's current situation and the organization's neglecting of praising nurses for their efforts, respectively (Table 3).

Table 3: The Scores of Perceived Organizational Support Among 160 Nurses Working in the Hospitals of Miandoab City

Perceived organizational support items	Mean	SD
The organization cares about my efforts and cooperation in optimizing the work condition.	2.68	1.68
The organization refuses any appreciation for my job efforts.	1.85	1.14
The organization ignores my complaints over job conditions.	1.88	1.14
The organization really cares for my well-being.	5.08	1.03
Even if I show the best job performance, the organization still censures me for my errors.	3.15	1.88
My job satisfaction is important for the organization.	3.60	1.28
The organization is the least concern about me.	4.39	1.74
The organization is proud of my work.	2.30	1.30
The total score of perceived organizational support	30.38	7.83

Also, the most frequent nursing work error was related to carelessness in measuring blood pressure (64.4%), and the least frequent error

included mistakes in reading doctors' pharmaceutical orders (36.9%) (Table 4).

Table 4: Absolute and Relative Frequencies of Work Errors Among 160 Nurses Working in the Hospitals of Miandoab City

Work errors	Yes		No		
	Number	%	Number	%	
Drug therapy	I administered the wrong medication to the patient.	91	56.9	69	43.1
	I administered two drugs simultaneously without considering their interferences.	86	53.8	74	46.2
	I administered a medication or analgesic to the patient without a doctor's prescription.	79	49.4	81	50.6
Reading prescriptions	I could not read the doctor's prescription.	91	56.9	69	43.1
	I misread the doctor's prescription.	59	36.9	101	63.1
Nursing care	I forgot to deliver a necessary nursing care.	71	44.4	89	55.6
	I failed to observe sterility requirements when performing wound dressing.	85	53.1	75	46.9
	I sent the wrong blood sample to the laboratory.	84	52.5	76	47.5
	I transfused the wrong blood product.	99	61.9	61	38.1
	I did not check the patient's health status.	96	60.0	64	40.0
	I forgot to take the patient's medical history.	98	61.2	62	38.8
	I forgot to take the patient's medication history.	82	51.2	78	48.8
Vital signs	I was reckless while measuring the patient's blood pressure.	103	64.4	57	35.6
	I was reckless while measuring the patient's heart rate.	73	45.6	87	54.4
	I was reckless while measuring the patient's respiratory rate.	90	56.2	70	43.8
	I was reckless while measuring the patient's body temperature.	64	40.0	96	60.0
Report writing	I made a mistake during report writing.	95	59.4	65	40.6

Spearman's correlation test showed that the overall score of stress sources was significantly and directly correlated with nursing work errors in the dimensions of drug therapy ($r=0.24$, $p=0.002$),

nursing care ($r=0.68$, $p=0.014$), and report writing ($r=0.10$, $p=0.030$), while there was no significant relationship with other dimensions (i.e., reading prescriptions and recording vital signs, $p>0.05$).

Also, there was an inverse statistically significant correlation between perceived organizational support and nursing care ($r=-0.19$, $p=0.016$). Moreover, Spearman's correlation disclosed a

significant inverse relationship between perceived organizational support and drug therapy ($r=-0.18$, $p=0.042$) (Table 5).

Table 5: Correlation Between Stress Sources Perceived Organizational Support, and Work Errors Among 160 Nurses Working in the Hospitals of Miandoab City

Dimensions of work errors/ Independent variables	Drug therapy	Reading prescriptions	Nursing care	Vital signs	Report-writing
Sources of stress	$r=0.241$ $P=0.002$	$r=-0.009$ $P=0.908$	$r=0.685$ $P=0.014$	$r=0.299$ $P=0.083$	$r=0.101$ $P=0.030$
perceived organizational support	$r=-0.182$ $P=0.042$	$r=-0.114$ $P=0.151$	$r=-0.190$ $P=0.016$	$r=0.148$ $P=0.072$	$r=0.058$ $P=0.464$

Person correlation, statistical significance level: $P<0.05$

According to the findings of the present research, out of four independent variables (i.e., perceived organizational support, sources of stress, years of service, and educational level), sources of stress

explained 8% of variations in the work errors of the nurses working at the hospitals of Miandoab city (Table 6).

Table 6: The Predictors of Nurses' work Errors based on the Independent Variables of Sources of Stress, Perceived Organizational Support, Years of Service, and Level of Education Among 160 Nurses Working in the Hospitals of Miandoab

Step	Independent variables	B	Beta	S.E.	R2	X2	df	p
1	Perceived organizational support	-0.004	0.996	0.023	0.065	10.82	1	0.84
	Sources of stress	0.123	1.131	0.043				0.004
2	Perceived organizational support	-0.008	0.992	0.023	0.086	3.63	2	0.719
	Sources of stress	0.115	1.121	0.043				0.008
	Years of service	-0.301	0.740	0.169				0.075
	Level of education	-0.139	0.870	0.190				0.463

*Dependent variable of work errors

Discussion

The findings of the present study showed that sources of stress and perceived organizational support were significantly associated with nurses' work errors in the dimensions of nursing care and drug therapy. Also, our results showed that the most frequent work errors of nurses were carelessness in measuring blood pressure, not paying attention to drug interferences, failure to read medication orders, mistakes in taking the patient's medical history, and examining the patient's health condition, respectively. The least frequent work error of the nurses was the incorrect reading of doctors' prescriptions. The

results of Tabatabai et al. (1394), who assessed the rate and types of medication errors by nurses in a private hospital, revealed that the most common error of nurses was "administering medication without a doctor's prescription", and the least frequent error was "administering a drug without noticing its expiration date" [16]. In another study, Saki et al. (2016), who examined the link between nursing errors and fatigue among nurses working in the emergency department, reported that the most and least frequent nursing errors were "medication error due to the doctor's unreadable handwriting" and "incorrect blood and blood product transfusion", respectively [3],

which was contradictory to the results of the present study. The comparison of the results of the present study with those of the above-mentioned studies suggests that nurses' work errors are more influenced by the environment of hospital wards and nurses' perception of the importance of the task in the specialized wards where they work. In this regard, the care services that were less important from the perspective of nurses were more frequently subjected to work errors. In non-government hospitals where medical students (interns and residents) are not present, and doctors are not easily accessible, administering drugs without a doctor's prescription is a less prominent error, or in the emergency department, where nurses give priority to the fast provision of care services and pay attention to the needs of patients and families, medication errors due to the doctor's bad handwriting is perceived less important.

In this study, there was a statistically significant relationship between sources of stress and nurses' work errors in the dimensions of drug therapy, nursing care, and report writing, which was in agreement with the findings of Zeller et al. (2013), a study conducted in Chicago, USA, declaring that nurses' occupational stress was associated with their work errors, and professional ethics played a mediating role between occupational stress and nursing work errors [17]. Researchers believe that these differences in the results of various studies can be attributed to variations in the work environments and sources of stress in hospitals, such as the number of nurses available to provide care to patients and nurses' workload based on the type of the hospital. In our study, regarding the relationship observed between sources of stress and work errors of nurses, one can construe that when nurses face a situation where there is a high job demand but inadequate resources, they develop occupational stress, leading to a reduction in job performance and an increase in work errors.

According to the results of the present study, there was a weak inverse correlation between perceived organizational support and nurses' work errors in the dimension of nursing care, meaning that nurses who perceived a higher level of organizational support perpetrated fewer nursing care errors. We found no study in Iran on the relationship between perceived organizational

support and nurses' work errors, so we could not compare our results with Iranian literature. However, our results can be indirectly compared with the observations of Simmons et al. (2013) in New York, who announced a significant relationship between perceived organizational support and positive organizational outcomes, such as the retention of nurses at their jobs [18]. Our results also agreed with the report of Kurtessis (2017) et al. in Virginia, declaring that perceived organizational support was associated with employees' organizational commitment, job performance, and welfare [19].

Also, here we noticed a statistically significant inverse but weak correlation between perceived organizational support and nurses' work errors in the drug therapy dimension. Despite the fact that we found no study investigating the direct relationship of perceived organizational support with work errors, our observation can be compared with the findings of Abu Hashish et al. (2017) in Egypt, who witnessed that organizational support was directly associated with nurses' professional ethics, organizational commitment, and employee retention [20]. Therefore, it can be said that the promotion of organizational commitment and professional ethics can reduce work errors. Explaining the inverse correlation observed between perceived organizational support and work errors in this study, one can address the flexible approach toward nurses' work errors in different situations and work environments. According to this approach, managers should manage work errors in a non-autocratic way and support nurses in order to prevent the error from happening again, knowing the fact that work errors in hospitals are inevitable, and it is best to manage them properly and prevent their recurrence. Otherwise, employees would refuse to report the error, paving the ground for its perpetration by others. Therefore, supporting personnel in different ways is closely linked with work errors and can play a key role in reducing them [21].

The results of this study showed that occupational stress was the most deterministic factor explaining nurses' work errors, which is consistent with the findings of Choi et al. (2018), who reported that sources of occupational stress among nurses considerably affected their job performance and organizational commitment [22]. Also, in a study

by Gulavani et al. (2014) in India, it was declared that stress was a factor causing nurses to have fewer incentives to continue their careers, encouraging them to quit the nursing profession [23]. Also, Kashima et al. (2015), in a study in South Africa, argued that occupational stress was a factor contributing to job burnout among nurses [24]. This result can be justified by the fact that occupational stress is a major problem that clinical nurses are struggling with in their work environments and can lead to adverse personal consequences for them, such as job burnout, reduced job performance, and an increase in work errors.

This was a pioneer study in Iran investigating the relationship between sources of stress, perceived organizational support, and the rate of work errors among nurses. There are some limitations inherent to the type of study (i.e., gathering data by self-reporting) and sample recruitment. There is also a possibility that working conditions (such as high workload) and fear of being disciplined by the organization could have affected nurses' self-reporting when filling out the questionnaires. Future studies are suggested to investigate the role of managers' support and employing stress coping strategies by nurses in reducing work errors and to assess the causes of work errors among nurses.

Conclusion

The results of this study showed that elevated sources of stress and low perceived organizational support predicted a higher rate of nursing work errors. These two factors, along with the years of service and the level of education, were identified to be important predictors of nurses' work errors. Since nurses' work errors are directly related to patients' health outcomes, it is critical for nursing managers to effectively provide nurses with organizational support, manage the sources of stress in their work environments, and equip them with appropriate stress-coping methods. The results of this study can be used by nursing instructors and managers to develop educational content for teaching the principles of nursing management and leader-exchange strategies. Also, the results of this study can help manage nurses' work errors by employing a flexible approach when handling errors.

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Conflict of interest

Authors declare no conflict of interest.

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