



Original Article

The relationship between missed nursing care and teamwork in emergency nurses: A predictive correlational study

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ABSTRACT

Background & Aim: Missed nursing care can reduce nursing care quality by eliminating or delaying any aspect of the patient's necessary nursing care. Teamwork has been a solution to improve the quality of care and safety of patients. The present study was conducted to determine the relationship between missed nursing care and emergency nurses' teamwork in the educational-medical centers affiliated to Iran University of Medical Sciences in 2019.

Methods & Materials: This cross-sectional study is predictive correlational in nature. It was conducted on 213 nurses working in the emergency department who were selected based on the census method from March 2018 to December 2019. The self-report data were collected using Nursing Teamwork Survey and Missed Nursing Care questionnaires. The data were analyzed through conducting ANOVA, t-test, Pearson correlation, and multiple regression analysis in SPSS version 16.

Results: The mean score of missed nursing care in the emergency nurses was 2.25 ± 0.65 , and the nurses' average teamwork was 3.53 ± 0.55 . There was a statistically significant yet inverse correlation between teamwork and missed nursing care ($p < 0.001$) ($r = -0.29$). The determination coefficient of the multiple linear regression modeling was used to predict the missed nursing care based on the total teamwork score indicated that 14% of the missed nursing care was explained under the influence of independent variables.

Conclusion: Due to the inverse relationship between teamwork and missed nursing care, it is necessary to design and plan training courses to further enhance the nurses' ability to perform teamwork and collaborative work.

Introduction

Missed nursing care is an example of imprudence in the nursing profession. In other words, such mistakes happen due to negligence in doing the right thing, such as interrupting in patient care. This type of error is more common than errors caused by carelessness, and it might remain undiagnosed in many cases. This type of error has more dangerous effects on patients' health; and therefore, it is very important (1-3).

Missed nursing care is a new concept in the field of health services, which was first introduced by Kalisch. This phenomenon refers to any aspect of nursing care required by the patient that has been completely or

partially eliminated or delayed. If patients' necessary care, any type of care, is either neglected or delayed, it is considered missed nursing care (4). There is evidence of weak to moderate effects of missed care on all healthcare provider organizations, including reduced quality of care, medication errors, falls, infections, bedsores and critical accidents, financial burden, leaving work, and absenteeism (5). Missed nursing care can result from an imbalance between time constraints, high workload, and multiple demands. So, due to the emergency department's nature, it is more likely to observe missed nursing care in this department (6).

It is more likely to observe delayed or even incomplete provision of the required care in the emergency department (7) due to a large number of unpredictable referrals throughout the day, the need for triage and prioritization of patients in critical

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conditions with different ages and conditions in the shortest possible time, the lack of sufficient information about many of the patients (8). The nature of the emergency department's job causes staff to encounter patients with emergencies and sometimes unknown symptoms for which they have no prior knowledge. The need for quick reactions and simultaneous referrals intensifies the staff's stress in this department (9). On the other hand, multiple interruptions in the nursing process due to unforeseen referrals and emergencies can lead to repetition and waste of time, hasty decisions, and unnecessary delays in the patient care process. And as a result, nosocomial errors will increase. Previous studies show that the emergency department, as the first point of contact between patients and care centers, encounters various problems and issues. Overcrowding, lack of manpower, and prolonged waiting time may lead to inadequate care and reduced quality of care in many cases. It can also lead to leaving the emergency department without receiving any care, which ultimately increases complications and even mortality rate (10-12). Researchers report that the lack of manpower in the emergency department and the need to provide prompt care to patients can lead to irreparable mistakes. They also report that blood transfusion is the most common human error in the emergency department because of the lack of manpower and overwork (13).

On the other hand, the emergency department is potentially a unique environment for teamwork and effective communication (14). Teamwork can save time, provide timely services, and reduce errors in the emergency department (15, 16). Teamwork has been proposed as a solution to improve the quality of care and safety of patients in the emergency department. In health, teamwork refers to a dynamic process involving two or more health professionals who can communicate with each other, have shared objectives, and commit to achieving those goals. They would also have complementary skills and show coordinated efforts to evaluate, care

for, and treat patients through mutual cooperation, open communication, and joint decision-making under the team leader's supervision (17). According to a review study, effective and optimal teamwork includes maintaining team structure in emergencies, workload management, strong leadership, defining the team members' roles, and supportive behavior. Such efficient teamwork can affect all four main areas of the emergency department like patients' safety, patients' satisfaction, employees' satisfaction, and hospital errors (9). In a seminal study, Porter et al. reported that 66% of emergency nurses had a positive attitude towards teamwork and stated that it has helped define their roles, responsibilities, and transparency and thus improve care quality (18). Kennedy et al. investigated the relationship between nurses and midwives. They stated that there are some strengths in the relationship between nurses and midwives and challenges in the workplace. The nurses' and midwives' positive attitude towards teamwork and commitment to teamwork in the emergency department and delivery center can lead to better interaction, respect for each other's roles and responsibility, and as a result, the desired outcome of high-quality care for mother and baby (19).

Moreover, the results of another study by Attia et al. showed that most of the nurses who work in the intensive care unit did not have a positive attitude toward teamwork because they did not know teamwork principles. They have not received any training and support from the managers in this regard (20). Despite all the evidence about the positive effects of teamwork on the quality of care and patient safety, teamwork may not always lead to the desired results. Teamwork sometimes results in negative conflict between the team members or between different teams, which ultimately leads to dysfunctional relationships between the staff and disregard and disrespect toward other team members. As a result, it leads to negligence in patient care (21). That is because nurses have different attitudes towards teamwork as well

as interaction and communication with each other and other members of the patient care team. Accordingly, researchers claim that different cultures, beliefs, and living and working environments are the main reasons for this phenomenon (22). For example, in developing countries and Eastern cultures where personal feelings and relationships often affect professional issues, nurses have a negative attitude towards the teamwork perspective and avoid interpersonal conflicts in order to avoid "hurting" their colleagues' feelings (21). The results of another study on the relationship between attitudes toward teamwork and attitudes toward patient safety in Taiwan indicated that nurses have low attitudes towards the infrastructure of monitoring teamwork. This might be due to the culture of "pure obedience" in Southeast Asia (23). In European countries, on the other hand, jealousy, pride, fear of losing power, fear of losing professional position, and the inability to communicate and collaborate effectively with the others due to lack of appropriate perception and awareness of the teamwork procedure have affected the individuals' attitude towards teamwork (24). In Iran, the risk factors for teamwork procedure include personal differences and weak intra-group communication, inappropriate perception of asking for help, lack of awareness of the teamwork process, and lack of adequate knowledge about their own role and the other group's roles members (25). In addition, since team activities' level changes over time, different levels of teamwork and team members' attitudes are needed at different times (26). For instance, another study results indicated a positive attitude toward teamwork when there was successful teamwork and a negative attitude toward teamwork when there was a disrupted or failed teamwork (27).

Limited studies were found on the relationship between missed nursing care and teamwork. The majority of the studies on missing nursing care have examined this concept in general wards or nursing managers. And there are almost no studies

on the relationship between missed nursing care and teamwork in different situations and environments, especially in the emergency department because of this department's specific conditions. On the other hand, there is a difference in the studies' results regarding the positive and promising effects of teamwork on reducing the number of missed nursing care cases. In this regard, the results of another study by Kalisch et al. on determining the relationship between teamwork and missed nursing care in intensive care units as well as general surgical wards indicated a significantly negative relationship.

However, they claimed that the relationship was very weak in general surgical wards (28). Moreover, the findings of another seminal study by Chapman et al. showed a significantly negative relationship between teamwork and missed nursing care; but, this relationship was noticeably different in various departments where nurses in the general surgical wards showed high teamwork abilities. Therefore, the rates of error and missed nursing care were low in this ward (8). Despite Abed et al. reported that ICU nurses had a positive and desirable attitude towards teamwork, the relationship between teamwork and missed nursing care was not significant (26).

Accordingly, teamwork is not the same in different cultures, environments, and situations. Although the researcher's personal experience shows many missed nursing care cases and hospital errors that endanger the patient's safety, there was no study to determine the relationship between missed nursing care and teamwork in the country. It seems necessary to conduct such studies in Iran due to the prominent role of cultural differences in teamwork. Given the importance of teamwork and special conditions in the emergency department, which can lead to increased missed nursing care, the present study aimed to determine the relationship between missed nursing care and nurses' teamwork in the Educational-Medical Centers' emergency department Iran University of Medical Sciences in 2019.

Methods

This cross-sectional study is predictive correlational in nature. It was conducted on emergency nurses in Educational-Medical Centers of Iran University of Medical Sciences from March 2018 to December 2019.

After receiving the recommendation letter from Iran University of Medical Sciences and presenting it to Educational-Medical Centers and emergency departments' executives, the researcher obtained written informed consent and then invited eligible participants to take part in the study. The study population includes all the nurses with at least a bachelor's degree who were working in the emergency department of Educational-Medical Centers affiliated to Iran University of Medical Sciences. Given the confidence level of 95% and test power of 80% and assuming that the correlation coefficient between missed nursing care and teamwork in emergency nurses was at least 0.2, the sample size was estimated to include 200 nurses. Since the total number of nurses working in the emergency departments of the studied hospitals was 233, all nurses were included in the study using the census method. The inclusion criterion was having at least 6 months of experience in the emergency department. Besides, the questionnaires with more than 70% unanswered questions were excluded from the analysis.

The data were collected based on self-report using a questionnaire in this study. The following questionnaires were used in this regard: the demographic information form (age, sex, marital status, type of hospital (general or specialty), educational degree, employment status, working shift, work experience, work experience in the emergency department, and passing a course or a unit on teamwork and patient safety/nursing errors), the Nursing Teamwork Survey (NTS), and the Missed Nursing Care Questionnaire (MISSCARE). The researchers would also respond to any questions regarding the objectives of the study and completion of the questionnaires.

In addition, in order to facilitate answering the questionnaires, they were distributed during the nurses' rest or at the end of the shifts. The researcher was present at the time of distribution of the questionnaires and provided the participants with the necessary explanations.

The Nursing Teamwork Survey (NTS) questionnaire was designed and validated by Kalisch et al. in 2010 with the aim of evaluating the teamwork of nursing staff (28). This self-report questionnaire includes 33 items in five themes of trust (7 items), awareness of teamwork (9 items), mutual support (6 items), team leadership (4 items), and shared mental model (7 items). It is also scored based on a five-point Likert scale ranging from always (5) to rarely (1).

The average score of the items is considered as a teamwork score, where the higher scores indicate better teamwork and the lower scores indicate weaker teamwork. Using test-retest, the total reliability coefficients and the five themes were measured 0.92 and from 0.77 to 0.87, respectively. The internal consistency of the questionnaire for all the 33 items as well as the 5 themes was determined based on Cronbach's alpha coefficient. The results showed a coefficient of 0.94 and 0.74 to 0.85, respectively.

The questionnaire was translated using the translation-retranslation method in this study. For this purpose, at first, a translator who was familiar with the medical concepts translated the text into Persian. The translated text was then translated from Persian into English by another translator (bilingual specialist) who was unaware of the original questionnaire. Then, the first and second researchers compared the Persian and English translated texts with the original text of the main questionnaire and reached a conclusion about the concepts and terms. This questionnaire's content validity was also assessed by a panel of experts consisting of three faculty members of the School of Nursing and Midwifery of Iran University of Medical Sciences.

The Missed Nursing Care Questionnaire was designed and validated by Williams and

Kalisch (4). The MISSCARE questionnaire is completed based on self-report. It contains 24 items regarding independent nursing activities that are not necessarily inter-related and is measured on a four-point Likert Scale from always (4) to never (1). The items' average score is considered the missed nursing care score, where the higher scores indicate more missed nursing care. The validity of the questionnaire was confirmed using content and construct validity. Internal consistency of the MISSCARE questionnaire was also measured based on Cronbach's alpha coefficient, and it was confirmed with a coefficient of 0.89. This questionnaire was translated into Persian using the open translation method. It was then translated from Persian to English by a person who is fluent in English. The content validity was reviewed by three faculty members of the School of Nursing and Midwifery of Iran University of Medical Sciences, and the necessary modifications have been applied. Cronbach's alpha coefficient was measured as 0.95 in the present study, indicating the questionnaire's desired internal consistency.

The collected data were analyzed using SPSS software version 16, and the level of significance was considered lower than 0.05. Descriptive statistics (absolute and relative frequency, mean and standard deviation) and inferential statistics were used to analyze the data in line with the research objectives. ANOVA and t-tests were also utilized to evaluate the missed nursing care based on the staff's characteristics. A Pearson correlation test was used to investigate the relationship between teamwork and missed nursing care. Multiple regression analysis was used to investigate the predictive role of teamwork and other contextual variables in predicting missed nursing care. Finally, the Kolmogorov-Smirnov test was applied to evaluate the normality of the distribution of the variables. The researchers used Enter linear regression analysis to examine which variables of teamwork dimensions highly correlate with missed nursing care.

In this study, the code of ethics was obtained from Iran University of Medical Sciences (no. IR.IUMS.REC.1398.127). The

researcher then introduced himself/herself and explained the objectives of the research to the participants. Besides, written informed consent was obtained from the participants. The participants were then ensured that all the information would be kept confidential and secure. They were also informed about leaving the study at any stage they wish without any adverse consequences.

Results

213 nurses working in the emergency departments participated in this study with a response rate of 100%. The demographic characteristics of the nurses under study are summarized in table 1. The nurses' demographic characteristics showed more than 50% of the nurses aged between 30 and 39 years average age of 33.01 ± 5.92 .

According to table 2, the average missed nursing care was 2.25 ± 0.65 . The highest and lowest teamwork levels belonged to the shared mental model (3.75 ± 0.57) and teamwork awareness (3.38 ± 0.57), respectively. As Table 3 shows, there is a significantly negative relationship between nurses' teamwork and missed nursing care ($P < 0.001$); in other words, any increase in nurses' teamwork score will lead to the reduction of missed nursing care score, which subsequently leads to the reduction of missed nursing care. This correlation coefficient was calculated as 0.29, indicating a determining coefficient of $s0.089$. Moreover, there is a significantly negative relationship between missed nursing care and all the dimensions of teamwork. However, this relationship between the dimensions of teamwork awareness, mutual support, and trust was very low (correlation coefficient of below 0.3).

According to the results (Table 4), team leadership ($p=0.002$) and mutual support ($p=0.03$) were significant in the regression model and "team leadership" had the greatest effect on missed nursing care with a standard coefficient of -0.408. The determinant coefficient was equal to 0.148 in this regression model. In other words, 14% of missed nursing care is explained by independent variables.

Missed nursing care and team work

Table1. The demographic characteristics of the nurses working in the emergency departments and the relationship with missed nursing care as well as teamwork

Variable	N (%)	Missed nursing care		Teamwork	
		Mean ± SD	P-value	Mean ± SD	P-value
Age (year)*	<30	58 (27.2)	2.72± 1.02	3/66±0/63	r=0.29 P= 0.67
	30-39	117 (54.9)	2.65±0.96	3/62±0/66	
	>40	38 (17.83)	2.64± 1.09	3/60±0/73	
Sex **	Female	165 (76.5)	2.75± 1.02	3/65±0/6	P=0.369
	Male	48 (23.5)	2.79± 0.96	3/57±0/66	
Marital status **	Single	80 (37.6)	2.60± 1.02	3/63±0/62	P=0.838
	Married	133 (62.4)	2.71±1	3/64±0/69	
Educational level **	Bachelor	203 (93.3)	2.67± 1.02	3/64±0/66	P=0.369
	Master's	10 (6.7)	2.56± 1.02	3/45±0/64	
Number of children *	0	36 (27.1)	2.54± 1.09	3.69±0.57	r=0.07 P= 0.39
	1	63 (47.4)	2.72±0.96	3.64±0.72	
	2 and more	34 (24.8)	2.86± 0.97	3.60±0.74	
Hospital type **	General	114 (55.1)	2.77± 0.97	3/51±0/62	P=0.004
	Specialized	93 (44.9)	2.54± 1.05	3/78±0/69	
Type of employment *	Contractual	15 (7)	2.49± 1.11	3/57±0/67	F=0.700 P=0.593
	Periodical	48 (22.5)	2.60± 1.04	3/62±0/59	
	Official	84 (39.4)	2.59±0.92	3/69±0/69	
	Private sector	36 (16.9)	3.18±1	3/48±0/65	
	Project-based	30 (14.2)	2.46± 1.01	3/70±0/69	
Emergency department work experience (year)*	< 3	103 (48.4)	2.72± 1.06	3/64±0/67	F=0.402 P=0.752
	4 to 6	69 (32.4)	2.60± 0.90	r= -0.11	
	7 to 9	24 (11.3)	2.65± 1.17	P= 0.11	
	10 or more	18 (8)	2.62±0.87	3/77±0/67	
Total work experience (year)*	<5	50 (23.5)	2.78±1.08	3/53±0/48	r=0.07 P= 0.26
	5 to 9	65 (30.5)	2.67± 1.02	r=1.2	
	10 to 14	68 (31.9)	2.70± 1	P= 0.38	
	15 or more	30 (14.1)	2.38± 0.87	3/68±0/52	
Shift work type*	Morning	30 (14.08)	2/07±0.71	3/49±0.55	F=0.624 P=0.600
	Long day	34 (15.96)	2/29±0/76	3/53±0/55	
	Evening and night	32 (15.02)	2/16±0/66	3/50±0/61	
	Rotate	117 (54.92)	2/31±0/6	3/55±0/55	
Teamwork training **	Trained	38 (17.84)	2.39± 1.07	3/70±0/71	P=0.482
	No training	175 (82.15)	2.73± 0.99	4/62±0/65	
Missed nursing care training / Nursing errors **	Trained	59 (27.7)	2.45± 1.10	3/90±0/66	P=0.001
	No training	154 (72.3)	2.75± 0.96	3/53±0/63	

* variance analysis ** independent t-test

Table2. Numerical indexes of missed nursing care and teamwork variables among emergency nurses

	Variables	Mean ± SD
Missed nursing care (1-4)	Total score	2.25 ± 0.65
	Team leadership	3.63 ± 0.66
	Teamwork awareness	3.38 ± 0.57
Teamwork (1-5)	Mutual support	3.46 ± 0.65
	Shared mental model	3.75 ± 0.57
	Trust	3.48 ± 0.73
	Total score	3.53 ± 0.55

Table3. The results of the total score of the Pearson correlation coefficient regarding missed nursing care and teamwork and its different dimensions among nurses working in the emergency department

Teamwork dimensions	Missed nursing care
Team leadership	r= -0.35 P< 0.001
Teamwork awareness	r= -0.22 P= 0.001
Mutual support	r= -0.19 P= 0.005

Shared mental model	r= -0.3 P< 0.001
Trust	r= -0.26 P< 0.001
Total score	r= -0.29 P< 0.001

Discussion

This predictive correlational study was conducted to determine the relationship between missed nursing care and teamwork among emergency nurses in Educational-Medical Centers of Iran University of Medical Sciences. The present study's findings showed that the total score of missed nursing care was higher than the average and indicated that the total score of nurses' teamwork was relatively high. Consistent with the findings of the present study, Yaghoubi et al. conducted a study in a military hospital in Tehran, where they concluded that the missed nursing care was moderate. They also found that the highest average missed nursing care was observed in the intensive care unit (29). However, the findings of another study by Zúñiga et al. in Switzerland in 2015 showed low missed nursing care (30). The differences in the results of these studies could be attributed to different settings. In addition, other healthcare staff also participated in their study. Furthermore, Torka Beydokht et al. conducted a seminal analytical study in Rasht in 2018. They reported good performance regarding nurses' teamwork capabilities (31). Contrary to the results of the present study, Hosseini and Soltani conducted descriptive research in the city of Kerman in Iran in 2016, where they reported moderate quality for nurses' teamwork (32). The differences in the results of these studies may lie in different study populations. In this study, the researchers only investigated teamwork among emergency nurses.

The present study's findings showed a significantly negative relationship between missed nursing care and teamwork. Thus, as teamwork increases, the likelihood of missed nursing care decreases. Moreover, the correlation between the two variables was weak, which can be justified by the fact that other important factors may also play a role in the occurrence of missed nursing care

that can be examined in further studies. Although the correlation was generally lower than average, it was higher than the average regarding the two dimensions of shared mental model and team leadership. The present study's findings are in line with the findings of another study by Yaghoubi et al. where they reported a negative and insignificant correlation between missed nursing care and teamwork. In this study, teamwork explained 12% of the changes in missed nursing care. Besides, nurses with more experience showed higher missed care, while supervisors and those nurses who considered the number of staff adequate reported lower missed nursing care (29).

Kalisch et al.'s study reported fewer missed nursing care, where there is more teamwork. Poor attitude towards teamwork and lack of ability to work in a team is an important factor in increasing errors and reducing patient safety. A single nurse cannot provide all the necessary care by himself/herself; however, a team with a positive attitude towards teamwork considers the job as the whole team's duty and responsibility. They would divide the duties among the team members by making timely and appropriate decisions; thus, it would help reduce the likelihood of missed nursing care (20).

In a study conducted by Gibbon and Crane in 2018, the researchers claimed that an inadequate number of nurses and working alone were the most important factors leading to missed nursing care. Therefore, the researchers consider teamwork as a very important factor in reducing the burden of necessary care among nurses (33). Another seminal study by Abed and Ahmed Mohamed showed that in spite of a high tendency toward teamwork, there was an insignificant relationship between teamwork and missed nursing care (26). Such inconsistencies can be related to the differences in the study populations'

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characteristics, focusing on nurses in intensive care units.

This study's findings showed that the two dimensions of team leadership and shared mental model have the highest negative correlation with missed nursing care. The shared mental model in teamwork refers to the importance of the individuals' knowledge and awareness of their own strengths and weaknesses as well as their awareness of their own responsibilities and those of the others (28). Teamwork awareness refers to the fact that people in a team should focus on their own duties and should avoid showing annoying behaviors and expressing their teammates' mistakes. Instead, they should give appropriate constructive feedback to their colleagues. The dimension of "trust" among team members refers to the timely sharing of information and the provision of constructive and unbiased feedback. The dimension of "supporting team members" means the ability to recognize support and help team members when necessary.

As a result, raising awareness of teamwork and support with transparency and a constructive approach can build trust and monitor mutual performance and prepare the ground for a shared mental model (28). Consistent with the present study's findings, a shared mental model was reported with the highest average of teamwork in a study in Egypt. The researchers claimed that due to the organized nature of work in the intensive care unit, the nurses are usually fully aware of their own duties and those of the other colleagues, and this leads to working based on a common pattern with less conflict and mutual respect (26).

On the contrary, the study's findings by Castner et al. in 2013 indicated that support, trust, and awareness had the highest average among all the dimensions of teamwork (34).

According to the present study results, 14% of the missed nursing care can be explained based on the two dimensions of team leadership and mutual support. A caring leader can create an appropriate working atmosphere for teamwork by

educating and guiding the individuals, implementing appropriate policies and regulations, revealing values, creating a balance between workload and payments, as well as practicing the laws appropriately. It is clear that team leaders can help improve individuals' and the team's job through appropriate planning and dividing the duties, direct monitoring of the individuals' activities, as well as setting and implementing connections, rules and regulations. In fact, an efficient team leader can create motivation and provide support for the individuals by providing infrastructures, facilitating processes, and improving interpersonal relationships in the team, but he/she can also be considered a proper role model for such values in the system.

Study limitation

One of the limitations of the present study is the sample that only includes nurses working in the emergency department in hospitals affiliated to Iran University of Medical Sciences. This may influence the generalizability of the results. The researchers recommend that such issues should be addressed in future studies with larger and more diverse sample sizes. Failure to report missed nursing care due to the fear of legal problems, losing one's status in the system, or bias might be considered another limitation in the present study.

Conclusion

Given the inverse relationship between teamwork and missed nursing care and the shortage of nursing staff, and the high workload in the emergency department, it is necessary to plan theoretical training courses and workshops to further enhance the ability to work in group partnerships. It is recommended to design and plan teamwork training courses for graduate nurses and those who work in care provider centers to further promote the ability to work in a team, build trust and strengthen mutual support among the peers. Nursing managers can also provide facilities

for planning and implementing measures to improve teamwork and identify barriers to teamwork. Nursing managers' support, proper monitoring of nurses' performance, and paying attention to their problems are among important factors in reducing missed nursing care. According to the research findings, it is suggested that nursing managers and supervisors have more control over the provided healthcare and job processes and also use the results to identify strengths and weaknesses, plan efficiently, and thus to show high-quality performances. This study's results can be a basis for further research to adopt appropriate plans such as patient education and drug management to reduce the amount of missed nursing care, especially in the emergency department.

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Conflict of interest

There is no conflict of interest in this study.

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