The Impact of Patient Safety Culture and the Leader Coaching Behavior of Nurses on the Intention to Report Errors: A Cross-Sectional Survey

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Abstract

Background

There is growing interest in examining the factors affecting the reporting of errors by nurses. However, little research has been conducted into the effects of perceived patient safety culture and leader coaching behavior of nurses on the intention to report errors.

Methods

This cross-sectional study was conducted amongst 256 nurses in the emergency departments of 18 public and private hospitals in Tabriz, northwest Iran. Participants completed the self- administered questionnaires and the data was analyzed using linear regression analysis.

Results

Overall, 43% of nurses had an intention to report errors; 50% of respondents reported that their nursing managers demonstrated high levels of coaching. With regard to patient safety culture, areas of strength and weakness were “Teamwork within Units” (PRR = 66.80%) and “Non-punitive response errors” (PRR = 19.66%). Regression findings highlighted a significant association between an intention to report errors and patient safety culture (B=0.123, CI 95%: 0.005 to 0.328, P = 0.026), leader coaching behavior (B=0.172, CI 95%: 0.066 to 0.347, P = 0.004) and nurses’ educational status (B=0. 787, 95% CI: -.064 to 1.638, P = 0.048).

Conclusions

Further research is needed to assess how interventions addressing patient safety culture and leader coaching behaviors might increase the intention to report errors.

Background

According to Sorra and Dyer patient safety culture (PSC) describes “management and staff values, beliefs, and norms about what is important in a health care organization, how organization members are expected to behave, what attitudes and actions are appropriate and inappropriate, and what processes and procedures are rewarded and punished with regard to patient safety” [1]. Safety has been defined as the freedom from accidental injury and error seen in terms of “execution”: the failure of a planned action to be completed as intended or “planning”: the use of the wrong plan to achieve a goal [2]. Such errors can occur at any point in the patient management process, including diagnosis, treatment, and prevention and they may or may not result in an adverse event [3].

Errors risk patients’ health and well-being as well as their lives, and can increase the cost of medical treatment, such that the quality of care is negatively affected [4]. James reported that, in US hospitals, a minimum of 210,000 deaths per annum were associated with medical errors [5]. In Australia, each year,

18000 preventable deaths are attributable to medical errors and at least 50000 patients are disabled [2], in Germany it has been found that, per annum, 25000 deaths result from 100000 medical errors per year [6]. Fundamental to error prevention is the principle that errors should be reported [7] and, to this end, systems have been established to promote error reporting: in Australia and the US in 2000, in the United Kingdom in 2003, and in France in 2006 [3].

In third world and developing countries accurate estimates are difficult because with no effective recording and reporting systems there is a shortage of research information ,however, it is thought that the medical errors rate is high [8]. In Iran, it is estimated that between 3% and 17% of inpatients experience unwanted side effects as a result of medical errors with 30% − 70% of these being preventable [9]. Despite such high rates of medical errors, Iranian healthcare organizations have poor levels of reporting [10, 11].

A review of existing literature found a relationship exists between the number of medical errors reported and elements of PSC [12–14]. It is evident that leadership is an important element of PSC and that patient safety can be both facilitated and inhibited by perceptions of leadership amongst nurses [15] with a leader's attitude being reported as a contextual factor in a health care professional's decision to raise issues in relation to patient safety [16, 17].

Adverse events are seen as providing “information-rich” data for learning and systems improvement by leaders who proactively strengthen PSC [18] and it has been seen that PSC is significantly impacted through education and coaching when leaders follow up on reports that are made [19]. In developing countries, leaders frequently focus their activities on data collection, audit and reporting rather than on catalyzing learning and supporting systems that lead to quality improvement [20]. However, a coaching program has successfully promoted alternative perspectives and supported positive change [21] coaching having emerged as a major tool to continue the education process and enable a change to team-based care [22]. Up to date guidance and the support of educators and coaches mean that nurses participate in life-long learning and a culture of safety is created and enhanced [23].

What research there is into leadership coaching for professionals in healthcare settings is anecdotal [24] and a solid evidence-base is yet to be established [25]. However, in Iran, the rate of medical errors in emergency departments is alarming [26] and a recent study in emergency departments has shown that medical errors occurred amongst 46.8% of nurses in emergency departments [8] are overcrowded, there are shortages of staff and equipment, and patients are admitted with life-threatening illnesses all making it more likely that there will be a higher incidence of medical errors [27]. According to a study conducted in the U.S, nearly 3% of all hospital accidents are related to the emergency department [28].

Given this and the paucity of research exploring the association between PSC, nurses' intentions to report errors and the coaching behavior of leaders [29] this study aims to investigate the relationship between these variables amongst Iranian emergency nurses.

Method

A cross-sectional survey design was adopted for the purpose of this study.

Setting and Participants

A survey was conducted in both public and private hospitals (N = 18) in Tabriz, northwest Iran between January and March 2019. The study population included 350 nurses working in 18 emergency departments with participants identified using census sampling. The inclusion criteria for the sample selection included (a) being a full time nurse; (b) employment in the emergency department for a minimum of 1 year, and (c) being available during the period of data collection.

Measures

All questionnaires were administered in Farsi and instruments not already available in this language were adapted to Farsi using a standardized back-translation procedure [30] by a panel of experts.

Patient safety culture

PSC was measured using the Hospital Survey on Patient Safety Culture (HSOPSC), developed by the Agency for Healthcare Research and Quality in the United States (2004) to determine nurses' perceptions of PSC [1]. The HSPSC questionnaire was translated into Farsi in 2012 and has been validated in a previous study [31]. The HSOPSC comprises 12 PSC dimensions, encompassing a total of 42 items, with 3 or 4 items per dimension. All items are measured with a 5-point agreement scale (from 1 = strongly disagree to 5 = strongly agree) or frequency (from 1 = never to 5 = always).
The mean score of each dimension was calculated. In addition, a Positive Response Rate (PRR) could be calculated for each item from responses of “strongly agree/agree” or “always/most of the time”. To calculate the PRR of each dimension, the first step was to compute the PRR for each item and then calculate the mean PRR across all items in the dimension. The mean PRRs of the overall HSOPSC can be similarly calculated [32].

- Scores of 75 % and above are considered as representing a good PSC/area of strength.
- Scores between 50 % and 75 % are considered as a neutral PSC.
- Scores of less than 50 % are considered as indicative of a poor/low PSC /need improvement [33].

The HSOPSC was used previously in studies that assessed the perception of staff on the PSC of several Iranian hospitals [31, 34]. In the study conducted by Moghri et al, the Cronbach’s Alpha of the questionnaire was reported to be 0.82 [31] and in this study to be 0.83.

Coaching Behaviors of the Nurse Leaders

Leader coaching behavior (LCB) was measured using the Coaching Behavior Scale, a survey tool designed to assess LCB amongst nurses developed by Stowell [35] and subsequently revised by Ko and Yu [29].

Two independent researchers, with a background in nursing, translated the LCB questionnaire into Farsi. The translation was double reviewed and checked by two professors both with background in nursing, leadership and in the English language. The LCB comprises 13 questions scored with a 5-point Likert scale measuring 4 behavioral factors: direction (3 items), development (3 items), performance evaluation (3 items), and relationships (4 items). The total scores range from 13 to 65 points. Higher scores indicate that the coaching behavior of a manager is perceived as positive.

The validity and reliability of the tool has previously been established by Ko and Yu [29], with good internal reliability at a Cronbach's alpha coefficient ranging from 0.78 to 0.98. In this study the Cronbach's alpha of the LCB was 0.92. The LCB of the nurses was divided into two groups: (high-performance coaching and low-performance coaching). The overall perception of LCB for each respondent was calculated by taking the average scores of the 13 items in LCB questionnaire. Using this mean score, individuals with a score higher than 3.5 were placed in the high-performance coaching group, and the rest were placed in the low-performance coaching group [29].

Intention to report errors: To measure the nurses' intentions to report their own or others' errors, we used an instrument developed by Kim [36] which poses 3 questions: "If you committed an error that had no adverse effect on patients in your current work situation, would you report the error?" "If your colleague committed an error with no adverse effect on patients in your current work situation, would you report the error?" and "Do you share information regarding errors or malpractice with others?" The response options were 'never', 'rarely', 'sometimes', 'usually', and 'always'. In Ko and Yu's study [29] the Cronbach alpha was 0.83; and in our study, it was 0.76. Previous research has established that appropriate performance of error reporting is indicated by answers that the respondent "always" or "usually" reported their clinical errors and "inappropriate" performance by the responses "sometimes", "rarely", and "never" [37].

The demographic variables of the respondents, including age, gender, marital status, educational qualification, professional experience (years), and work time (hours per week) were collected at the end of the survey.

Data Analysis

Data analyses were conducted using SPSS 22.0 (IBM Corp., Armonk, NY, USA). The demographic characteristics of the respondents were described using descriptive statistics including frequency, percentage and means and standard deviations. Multiple Linear regression analysis was used to determine the relationship between PSC, LCB and intention to report errors. Bivariate linear regression analysis was used to assess the impact of PSC and LCB on nurses' intention to report errors. A multivariate regression analysis was then performed including all main and demographic variables. The level of significance was set at 0.05.

Results

279 responses were received over a 3-month period. Of these 23 were excluded from the analysis as they were less than 50% complete or did not meet the inclusion criteria. With an overall response rate of 73.14%, a total of 256 questionnaires were analyzed.

Characteristics of sample are summarized in Table 1. The majority of the sample was female (68.4%) and held a Bachelor's degree in nursing (54.4%). 54.7% participants were married. The majority came within the age group 31–40 years (44.5%), and the mean age of the participants was 35.38 (SD = 8.58) years. The average experience in nursing was 10.86 (SD = 7.98) years and 42.2% had been working in nursing for more than 10 years. 53.9% nurses worked less than 44 hours per week and 58.6% were in permanent employment.

The PRRs and mean (SD) scores of PSC, LCB and intention to report errors are shown in Table 2. Mean (SD) scores for PSC ranged from 2.54 (0.69) to 3.79 (0.69) and the PRRs ranged from 19.66% to 66.80%. The PRRs of PSC dimensions were all less than 75% and the overall PRR was 44.82%. The PRR of "Teamwork within units" (PRR = 66.80%) was the highest followed by "Manager Expectations" (PRR = 65.80%). The PRR of "Non-punitive response errors" (PRR = 19.66%) was the lowest.

Mean (SD) scores of LCB ranged from 3.23 (0.92) to 3.32 (1.03). The overall mean (SD) score of LCB was 3.27 (0.66) and of the four dimensions, the highest and lowest perceived coaching performance related to "Performance Evaluation" (55.5%) and "Direction" (35.9%). The mean (SD) score of intention to report errors among nurses in this study was found to be 3.41 (0.89). Of the total participants (n = 256), 43% reported that they had a high intention to report errors.

Table 3 shows the results of bivariate and multivariate linear regression analysis which was used to predict nurses' intention to report error. In bivariate analysis, PSC and LCB were associated with intention to report error and the result of multivariate is similar to bivariate analysis.

A statistically significant difference was shown between the educational level of nurses and their intention to report errors. Nurses with associate degree education were 78.7% times more likely to report errors than those with Bachelor, Masters or PhD degree (B=0. 787, 95% CI: -.064 to 1.638, P = 0.048). No significant relationship was found in relation to other demographic characteristics. An increase of 12.3% in the intention to report errors was observed for a one unit increase in the score on PSC (B=0.123, CI 95%: 0.005 to 0.328, P = 0.026). Similarly, an increase of one unit in the score on LCB, the intention to report error was increased 17.2% (B=0.172, CI 95%: 0.066 to 0.347, P = 0.004).

Discussion

This study examined the relationship between emergency nurses' perception of PSC and LCB with their intention to report errors and the results show that, based on PRR scores, none of the 12 dimensions achieved scores of 75% cannot therefore be considered as representing areas of patient safety strength; this result is in contrast to findings of other research [38, 39]. This result was also lower than other studies

conducted in countries including Taiwan [40], Lebanon [39] and Saudi Arabia [41] with cultural and organizational differences relating to patient safety thought to explain the differences.

A previous Iranian study conducted in an academic intensive care unit [42], like the results in this study, found that all dimensions needed to be improved. These findings contrast with those of Habibi et al. (2016) where a higher PRR score was found in teaching hospitals in Tehran [43]. A recent Iranian systematic review illustrates that, compared to the results of studies conducted in other countries, the mean of the responses in Iran for the different dimensions of PSC is low a finding which underlines the fact that, for many people working in Iranian hospitals (including the managers), the concepts of PSC are unknown [44]. This is possibly because, rather than the issue being neglected, PSC is a relatively new concept in Iranian hospitals and has not been fully recognized [45].

The dimension with the highest PRR was “Teamwork within units”. Whilst this reflects the findings of other studies [46, 47] in our study it was an area of patient safety weakness. “Non punitive response to error” had the lowest PRR, a finding which follows an earlier study conducted in a public hospital in Tabriz and which examined the same issues [48]. These findings are consistent with other local findings [38, 43] and those from international studies [39, 46, 49], and would suggest that a major barrier to error reporting is the risk of a punitive response. Nurses in this study like those in other similar studies felt that if they reported their errors a record of their mistakes would be held in their personal file and may be used against them at some point in the future and, for this reason they preferred silence over reporting errors.

It is of interest that 50% of nurses in this study tended to rate their managers’ coaching behavior as high. In line with the study conducted by Ko and Yu [29] the highest and lowest perceived LCB in this study was attached to “Performance evaluation” and “Direction”. It is important to note that, in respect of “Performance evaluation”, only half of the participants described their leaders as being high-performing coaches and that in respect of “Direction” the percentage was 35.9%. Given the evidence that a lack of performance appraisal can impact negatively on nurse performance [50] and that coaching on the part of team leaders supports learning from problems and errors amongst members [51], it can be concluded that the perceived coaching behavior in this study may impact negatively on nurse performance in respect of safety related issues.

This study found that, overall, 43% of nurses had a high intention to report errors, a similar finding to those of earlier studies in other countries [52–54] in which it was demonstrated that the proportion of error reporting amongst nurses was less than 50%. These findings are significant as there is evidence which suggests that whilst nurses intercept 86% of potential errors [55] between 34% and 50% don’t report medical incidents [56].

In looking to explain the low rates found in these studies it is possible that an intention to report is linked to an attitude towards reporting and an awareness of reporting, as well as the existence of support [4]. There are also a multitude of reasons, including fear, humiliation, a punitive reporting culture and limited follow up following error reporting, that may lead to underreporting [57]. Having said this it was found, in an Ethiopian study, that the proportion of error reporting amongst nurses was 57.4% [58], a difference that

may be related to differences in error reporting systems and to differences in the time frame in which the studies were conducted.

This study found a significant association between nurses' intention to report errors and the level of their level. Those nurses with an associate degree education were 78% more likely to report errors than nurses at a different educational level. This may be because professional nurses have a fear of legal consequences or of losing their occupational position [59]. In contrast a study conducted by Poorolajal et al. (2015) found that managers and staff who had attained higher educational levels had greater willingness to report errors [10].

Nurses who experienced a high level of PSC were found to be more likely to report errors in this study, a finding which reflects that of Kagan et al. (2013) whose Israeli study confirmed that a readiness to report errors was influenced by an organization's safety culture [54]. Furthermore, a flexible culture can promote patient safety and error reporting within an organization by developing trust and improving the problem-solving capabilities of nurses [29].

This study also found that nurses who saw their managers' coaching as being at a high level of performance reported a stronger intention to report errors, a finding which follows that of Ko and Yu [29]. In nursing a manager develops capabilities by exposing nurses to appropriate coaching strategies which together with regular feedback encourages them to work independently [60]. As has been pointed out by Reid Ponte et al [61] nurses who have experienced coaching describe it as helping them to recognize and modify behaviors that have hampered their performance, and in so doing improve their own effectiveness and that of the organization.

Conclusion

In this study the intention to report errors among nurse respondents was low. Given that a high perception of PSC and LCB increases nurse intention to report error it seems that hospital managers and nursing administrators have an important role to play in that they have the power to shape the working environment such that barriers to error reporting are removed and nurses are supported for doing so. Given that the greatest contributor to low levels of PSC relates to "non-punitive response errors" and the fact that a fear of punishment has consistently been found to reduce the frequency of error reporting [62], it is incumbent on health decision makers to adopt programs that create an atmosphere in which individuals can openly discuss medical errors and potential hazards.

Further, a culture which sees errors as an opportunity to improve a system should replace a blame culture, in which errors are seen as personal failures. Indeed the usefulness of education and of efforts towards developing a culture which encourages the reporting of patient safety issues is evident. Neither should it be forgotten that nurses who perceived the manager's coaching as being of a high level of performance reported a stronger intention to report errors. Medical errors cause patients across the world to suffer disabling injuries and leadership coaching could be a significant means by which error reporting is

facilitated thereby benefiting not only patients and their families and those that work in the health service, but also the wider community.

Declarations

Ethical Statement and consent to participate

The study was reviewed and approved by the Ethics Committee of Tabriz University of Medical Science (IR.TBZMED.REC.1397.272). Attached to each questionnaire was a cover letter explaining what was expected of the respondents who had to sign indicating their informed consent before they provided answers. In this way the full understanding and the voluntary participation of the respondents was established. Throughout the research confidentiality was respected and ensured. The third author obtained permission to use the questionnaires from the copyright holders via e-mail.

Consent for publication

Not applicable

Availability of data and materials

The datasets analyzed during the current study are available from the corresponding author on reasonable request.

Competing interests

None declared.

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Authors' contributions

ZCH designed and conducted the study, performed the analysis and drafted the manuscript. EK advised on the study design, facilitated data collection and revised the manuscript. AJ helped coordinate the study and assisted in data collection. MAJ assisted in data collection and data analysis. ZCH and EK validated the analysis findings and revised the manuscript. All authors read and approved the final manuscript.

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Abbreviations

PSC: Patient safety culture, HSOPSC: Hospital Survey on Patient Safety Culture, PRR: Positive Response Rate, LCB: Leader coaching behavior, SPSS: Statistical Package for Social Sciences.

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Tables

Table 1. General Characteristics of sample (N = 256)

Characteristics	N (%)
Gender	
Male	81 (31.6)
Female	175 (68.4)
Marital status	
Single	116 (45.3)
Married	140 (54.7)
Age (in years)	
21-30	80 (31.3)
31-40	114 (44.5)
>40	62 (24.2)
Professional experience (in years)	
≤5	81 (31.6)
6- 10	67 (26.2)
>10	108 (42.2)
Education Level	
Associate degree	13 (5.1)
Bachelor’s degree	147 (54.4)
Master’s degree & PhD	96 (37.5)
Employment Status	
Permanent	150 (58.6)
Contract	106 (41.4)
Weekly work time (Hour)	
Normal (≤44)	138 (53.9)
Overtime (>44)	118 (46.1)

Table 2. Descriptive statistics of the PSC, LCB and Intention to Report Errors

Variables	Mean (SD)	PRR (%)	Judgment
Teamwork within units	3.79 (0.69)	66.8	Neutral
Manager expectations	3.75 (0.91)	65.80	Neutral
Feedback communication about errors	3.73 (0.83)	57.17	Neutral
Staffing	3.42 (0.77)	54.17	Neutral
Events reported	3.31 (0.99)	52.23	Neutral
Management support for patient safety	3.27 (0.88)	48.23	Weakness
Perception of patient safety	3.21 (0.75)	43.85	Weakness
Organizational learning	3.17 (0.73)	42.87	Weakness
Communication openness	3.04 (0.71)	38.07	Weakness
Teamwork across units	2.73(0.89)	26.66	Weakness
Handoffs and transitions	2.68 (0.63)	22.30	Weakness
Non-punitive response errors	2.54 (0.69)	19.66	Weakness
Overall PSC	**2.91 (0.66)**	**44.82**	Weakness
		High-performance coaching (%)	
Performance evaluation	3.32 (1.03)	55.5	-
Development	3.27 (1.06)	43.8	-
Relationship	3.25 (1.00)	45.7	-
Direction	3.23 (0.92)	35.9	-
Overall LCB	**3.27 (0.66)**	**50**	-
Intention to report errors	**3.41 (0.89)**	**43**	-

PSC. Patient safety culture, LCB. Leader coaching behavior, PRR. Positive Response Rate. (PRR > 75% was defined as patient safety strength)

Table 3 Multiple regression analysis of factors associated with intention to report error (N = 256)				
Variables	Bivariate Beta (95% CI)	p	Multivariate* Beta (95% CI)	p
(Intercept)				
Patient safety culture	.130 (.012 to .341)	.036	.123 (.005 to .328)	0.026
Leader coaching behavior	.161 (.047 to .341)	.010	.172 (.066 to .347)	.004
Age (reference: >40)				
21-30			.096 (-.330 to .521)	.659
31-40			.165 (-.142 to .471)	.293
Gender (reference: female)				
Male			-.082 (-.342 to .178)	.233
Marital status (reference: married)				
Single			.091 (-.141 to .323)	.187
Education level (reference: Masters or PhD degree)				
Associate degree			.787 (-.064 to 1.638)	.048
Bachelor			.568 (-.144 to 1.279)	.118
Employment status (reference: Contract)				
Permanent			-.219 (-.474 to .037)	.094
Professional experience (reference: >10)				
≤5			-.220 (-.522 to .081)	.153
6- 10			-.274 (-.658 to .111)	.163
Work hours (reference: overtime)				
Normal			.099 (-.115 to .313)	.365
R^2	4.7%		15.3%	

Dependent Variable: intention to report error/ Total R = 39.2%/ There was significant predictive ability of second part of the model (F Change (6, 211) = 4.948, P<0.001)

*Adjusted for demographic variables