

Research Article

DESIGNING A MODEL TO MEDICAL ERRORS PREDICTION FOR OUTPATIENTS VISITS BY KILMANN CONFLICT QUESTIONNAIRE

Mirhosseini S.M.¹, *Nasiripour A.A.¹, Tabibi S.J.¹, Raeissi P.² and Ghaffari F.³

¹Department of Health Services Management, Science and Research Branch, Islamic Azad University, Tehran, Iran

²Department of Health Services Management, Iran University of Medical Sciences, Tehran, Iran

³Department of Economics, Science and Research Branch, Islamic Azad University, Tehran, Iran

*Author for Correspondence

ABSTRACT

Conflict style management (CSM) is one of variables effects on medical errors occurrence. In this study, a model has been designed to predict medical errors in outpatients' visits according to five categories of CSM (Kilmann's attitude). 114 physicians were investigated by a field study and medical errors were calculated in per cent. The physicians divided into two groups of wrong doer and unerring on base of the concept of error and its normal distribution. CSM was calculated by Kilmann questionnaire. Data were analysed to design a model by binary logistic regression in SPSS20. Receiveroperating characteristic (ROC) was applied to evaluate the validity. Number of unerring physicians was 27 and wrongdoers 87. Medical errors' mean was 0.43 ± 0.13 . Chi-Square significant was 0.00; Nagelkerke's R square 0.690. Parameter of Avoiding style in the model was -0.260 with significance level of 0.071. Competing (-0.142, sig=0.236), Compromising (0.509, sig=0.016), Accommodating (-0.513, sig=0.008) and Collaborating (-0.954, sig= 0.00); area under the curve was 84.70. Avoiding and competing were deleted from the model because of insignificance. Compromising had a direct relationship; the others had a reverse relationship with the medical errors occurrence. Applying educational strategies to make physicians more familiar with CSM can diminish medical errors occurrence during out patients' visits. Likewise, the best styles to manage conflict would be accommodating and collaborating.

Keywords: Medical Errors, Conflict Style Management, Outpatients Visits

INTRODUCTION

Patients have a basic expectation when they receive health care: that they will not be harmed in the process (Van *et al.*, 2011). Unfortunately, unavoidable complications do cause harm to some patients, and still others are injured as a result of preventable medical errors (Van *et al.*, 2011). Furthermore, Medical errors lead to the death of up to 98,000 Americans annually and cost the U.S. economy over \$17 billion per year (Rolston *et al.*, 2014). Hence, Medical errors, in particular those resulting in harm, pose a serious situation for patients (first victims) and the health care workers involved (second victims) and can have long-lasting and distressing consequences (Schwappach, 2015).

Medical error has emerged as one of the Nation's most pressing healthcare challenges and a major social policy problem (VanGeest *et al.*, 2003). Therefore, A major challenge in improving patient safety is teaching healthcare professionals new skills and ways of relating to patients and to each other (VanGeest *et al.*, 2003). Moreover, Physicians have an opportunity to provide strong and visionary leadership in patient safety (VanGeest *et al.*, 2003).

Thus, To succeed, however, they must understand the relationship between errors in healthcare system and different kinds of safety issues (VanGeest *et al.*, 2003).

Concerns about physicians' communication skills are not really new. For decades, there have been calls for physicians to pay greater attention to the person with the disease rather than to the disease itself (Levinson *et al.*, 2011). Meanwhile, Dealing effectively with conflict is an essential skill for team membership and the provision of collaborative care (Elua *et al.*, 2014). Furthermore, Theoretically, conflict is inevitable among human and it is a natural interaction that begins when two or more social

Research Article

entitles (Janssens, 2006). As a result, conflict can be viewed as an external stressor that requires internal resiliency and a sense of empowerment to manage it effectively (Elua *et al.*, 2014).

Conflict can manifest in a number of ways including intimidating and disruptive behaviours between individuals (Elua *et al.*, 2014). Likewise, these behaviours can be covert or overt and include nonverbal and verbal behaviours such as withholding information, innuendo, and negative verbal responses (Elua *et al.*, 2014). Meanwhile, such behaviours decrease communication between individuals and impede the development of positive working relationships, necessary for effective collaboration (Elua *et al.*, 2014).

It is generally accepted that conflict style management depends on the situation and the parties involved and involves a choice of methods to manage a situation (Elua *et al.*, 2014). Managing conflict focuses on maintaining it at the right level to help the department, work unit or organisation reach its goals (Abd-Karim *et al.*, 2014). Thomas Kilmann model of conflict resolution is a widely used approach to understand different ways people deal with conflict (Abd-Karim *et al.*, 2014). Five categories of Thomas and Kilmann conflict management styles include: accommodating, avoiding, collaborating, competing and compromising (Elua *et al.*, 2014; Abd-Karim *et al.*, 2014; Al-Hamdan, 2009; Lian *et al.*, 2008).

Accommodating is unassertive and cooperative and allows the other person to dominate. Avoiding is both uncooperative and unassertive and is characterized by the individual's avoidance of taking any action. Collaborating is assertive and cooperative and represents an attempt to find a solution to the conflict. Competing is assertive and uncooperative. compromising is intermediate in both assertiveness and cooperativeness and partially satisfies the needs of each party (Elua *et al.*, 2014; Abd-Karim *et al.*, 2014; Al-Hamdan, 2009; Lian *et al.*, 2008).

They offer insight for managers, nurses and human resource practitioners to help build high trust relationships in a health care context (McCabe *et al.*, 2014). In this study medical errors and conflict style management related to physicians in outpatients evaluated, after that a link was set between them to represent a model would be able predict the ranges of medical errors committed.

MATERIALS AND METHODS

Methods

Firstly, a field study was conducted on 114 Iranian physicians in different majors who were selected as a simple random sampling from Yazd province for research on medical errors occurrence. Besides, Medical errors connected to the outpatients' visits. Furthermore, for evaluation medical errors, researcher has studied the standard approaches some common disease in each majors, after that pursued the samples reactions against patients' complaints.

Meanwhile, the researcher was a general practitioner and the diseases have been selected for following were the most common disease in each major.

Secondly, Thomas Kilmann conflict management scale was administered to collect the data. Therefore, five categories which physicians could use to manage their conflict evaluated. All physicians complete the forms. Each dimension was considered as an isolated variable for statistical analysis and representing the model.

Thirdly, for each physician the per cent of the medical errors were calculated according to the total number of their visits and the number of visits leading to errors. As a result, it was a fraction demonstrated the per cent of medical errors for each physician on per cent. After that according to the concept of normal distribution of errors, the physicians were divided into two groups: wrongdoer and unerring. This classification was done on base of the concept of normal distribution of error happening.

Fourthly, Medical error as a binary variable and five dimensions of the conflict style management were used in regression logistic to represent a model by SPSS20. After that, the model was designed. Some variables were omitted, although others remained and the parameters were determined.

Finally, the validity of the model was assessed by receiver operating characteristic (ROC). Also the sensitivity and specificity were evaluated.

Research Article

RESULTS AND DISCUSSION

Table 1: Descriptive statistics of medical errors occurrence

	Max	Min	Mean	Standard deviation	Standard errors
Medical errors	0.74	0.17	0.43	0.13	0.01

Table 2: Descriptive statistics of physicians' conflict style management

Conflict Style Management	Max	Min	Mean	Standard deviation	Variance	Cronbach's alpha	Standard errors
Avoiding	21	9	15.30	2.75	7.54	0.74	0.26
Competing	21	9	14.46	2.89	8.37	0.72	0.27
Compromising	20	5	13.47	2.57	6.59	0.75	0.24
Accommodating	20	10	14.36	2.51	6.30	0.80	0.23
Collaborating	23	5	13.84	2.77	7.66	0.81	0.26

Table 3: Logistic regression analysis

Conflict Style Management	Correlation coefficient	Significant	Odds ratio	Standard error	Wald	Degrees of freedom
Avoiding	-0.260	0.071	0.771	0.144	3.263	1
Competing	-0.142	0.236	0.876	0.120	1.407	1
Compromising	0.509	0.016	1.664	0.211	5.803	1
Accommodating	-.513	0.008	0.599	0.193	7.092	1
Collaborating	-0.954	0.000	0.385	0.228	17.548	1
Constant	22.369	0.000	51831775591	5.556	16.207	1

Results

In overall, 5527 visits were followed for 114 physicians. Medical errors occurrence's mean among physicians was 0.43 with standard deviation 0.13(table1). Hence, the range of medical errors between 0.30 and 0.56 was considered as one standard deviation from both sides of the mean. As a result, the physicians who were 27 persons had lower than 30% medical errors were assumed as unerring; while the others were 87 physicians supposed as wrongdoer with more than 30% medical errors occurrence.

According to conflict style management instrument (TKI) which was conducted the mean of avoiding style was 15.30 (cronbach's alpha (α) = 0.26), competing 14.46 (α = 0.72), compromising 13.47 (α = 0.75), accommodating 14.36 (α = 0.80) and collaborating 13.84 (α =0.81) (table 2).

Odds ratio of avoiding style was 0.771, while for competing style was 0.876, compromising 1.664, accommodating 0.599 and collaborating 0.358 (table3). Chi-Square significant was 0.00 and Nagelkerke's R squared 0.690.

Correlation coefficient for avoiding style was (-0.260, sig=0.071), competing (-0.142, sig=0.236), compromising (0.509, sig=0.016), accommodating (-0.513, sig=0.008) and collaborating (-0.954, sig=0.001) (table3). It was considered to represent the model.

Avoiding and competing styles were deleted from the model because of insignificance, although the others remained. Consequently, on base of the Wald test, Odds ratio and correlation coefficient the model represented:

$$F(X) = 0.509X1 - 0.513X2 - 0.954X3 + 22.369$$

$$F(X) = Lne^{\frac{Pi}{1-Pi}}$$

X1: compromising style of CSM

X2: accommodating style of CSM

X3: collaborating style of CSM

Pi: probability for medical errors occurrence in outpatients visits

Research Article

Calibration by Hosmer-Lemeshow test Chi square was 70.105 ($P < 0.001$) and discrimination by area under ROC curve 0.84. The validation dataset had 5527 outpatients' visits by 114 physicians. Sensitivity of the model was 95.4% and specificity 74.1%.

Discussion

Conflict resolution ability is the skill to affectively resolve conflict by determining which of these conflict resolution strategies is most appropriate for a given situation (Ramirez, 2010). Thus, in these circumstances the ability and skills of physicians for conflict management have been followed to link them with the ranges of medical errors occurrence to predict which style would be much more appropriate to diminish medical errors.

The highest mean conflict style management was related to avoiding and the lowest mean compromising. Competing, accommodating and collaborating were ordered on base of their mean. According to the odds ratio (table 3), compromising has a direct relationship with medical errors occurrence (>1) and accommodating and collaborating (<1) have reverse relationship with medical errors occurrence. Suggested model would be valid, sensitive and specific.

According to the represented model in this study, we can acclaim compromising would enhance medical errors happening, while accommodating and collaborating would diminish it. The others such as avoiding and competing were not significant. Therefore, the best way was accommodating, and then collaborating according to the odds ratio results (table3). These results were compatible with Ramirez, Sportsman and Kilmann investigations (Ramirez, 2010; Sportsman *et al.*, 2007).

According to the investigation of Sportsman and Hamilton compared to the TKI norms, slightly more than one half of all participants chose two or more styles to manage conflict, commonly avoidance and accommodation at the 75th percentile or above. Only 9.8% of the participants chose collaboration at that level (Sportsman *et al.*, 2007). Likewise, in this study the most common styles were avoiding, competing and after that accommodating. They were partially compatibles.

Gerry in 1989 found that nurses rated themselves more assertive outside of work than at work and demonstrated a trend toward conflict avoidance (Okuyama *et al.*, 2014). Furthermore, much more using of avoidance style between nurses has been discovered in investigations of Cavanagh, Eason and Brown, Hightower (Cavanagh, 1991; Eason *et al.*, 1999; Hightower, 1986). Similarly, avoiding and following competing and compromising were the most common styles were used by physicians in this study.

The Jordanian nurse managers who were working in Oman focused on improving nursing care, and planned to stay a long time, and therefore used compromising as a preferred style of conflict management (Al-Hamdan, 2009). While Omani nurse managers preferred accommodating and collaborating styles, whereas Jordanian nurses preferred compromising and accommodating styles (Al-Hamdan, 2009). Furthermore, Accommodating style was considered as most common way between health care staff in Woodtli investigation (Woodtli, 1987).

In opposite, accommodating and compromising styles were the least common identified popular for physicians in this investigation which is completely in paradox.

Some recommendations in managing conflict are dictated by discussing the problem such as open talk, self-patience, endurance and being decisive as well as educating all the staffs in handling conflict (Abd-Karim *et al.*, 2014). Thus, it would be logical, educational planning for conflict style management not only for physicians but also for other health care authorities' cares and staff to learn how to manage their conflict and which style would be much more appropriate to diminish the medical errors.

Conclusion

There was a significant relationship between medical errors occurrence and conflict style management by physicians. Consequently, educational planning for physicians would be truly lucrative. As a result, the educational fields and situational administration styles would consider utilizing accommodating and collaborating styles. Furthermore, attempting to restriction the compromising style can diminish medical errors occurrence. Another important point is that the model would support just the outpatients.

The range of medical errors for each physician would be predictable by the TKI questionnaire. The representative and executive manager would be able to select eligible physicians for health care centers

Research Article

and educate others to reduce probability errors. It looks reasonable to conduct more studies in other communities to compare the result and outcomes.

ACKNOWLEDGEMENT

This work is a thesis for PhD which is done in Tehran Science and Research Branch, Islamic Azad University, Tehran, Iran.

REFERENCES

- Abd-Karim SB, Marani DA, Danuri MM and Mohamed O (2014).** Managing Conflicts in Joint Venture Projects. *International Journal of Property Sciences* **4**(1) 1-15.
- Al-Hamdan Z (2009).** Nurse Managers, Diversity and Conflict Management. *Diversity in Health and Care* **6**(1) 31–43.
- Cavanagh SJ (1991).**The Conflict Management Style of Staff Nurses and Nurse Managers. *Journal of Advanced Nursing* **16**(10) 1254-60.
- Eason FR and Brown ST (1999).**Conflict Management: Assessing Educational Needs. *Journal for Nurses in Professional Development* **15**(3) 92-96 .
- Elua WP, Cook JD , Jennifer D and Cynthia R (2014).** Enhancing Resilience, Empowerment, and Conflict Management Among Baccalaureate Students: outcomes of a pilot study. *Nurse Educator* **39**(2) 85–90.
- Hightower T (1986).** Subordinate choice of conflict-handling modes. *Nursing Administration Quarterly* **11**(1) 29.
- Janssens M and Brett JM (2006).** Cultural Intelligence in Global Teams: A Fusion Model of Collaboration. *Group and Organization Management* **31**(1) 124–153.
- Levinson W and Pizzo PA (2011).** Patient-physician communication: it's about time. *The Journal of the American Medical Association* **305**(17) 1802-1803.
- Lian LK and Tui LG (2008).** Effects of individual characteristics and organizational context on superiors use of conflict styles and subordinates satisfaction with supervision. *Asian Academy of Management Journal* **13**(1) 37-62.
- McCabe TJ and Sambrook S (2014).** The Antecedents, Attributes and Consequences of Trust among Nurses and Nurse Managers: A Concept Analysis. *International Journal of Nursing Studies* **51**(5) 815–27.
- Okuyama A, Wagner C and Bijnen B (2014).** How We Can Enhance Nurses' Assertiveness: A Literature Review. *Journal of Nursing and Care* **3**(5) 1000194.
- Ramirez AR (2010).** Impact of Cultural Intelligence Level on Conflict Resolution Ability: A Conceptual Model and Research Proposal. *Emerging Leadership Journeys* **3**(1) 42–56.
- Rolston JD, Zygourakis CC, Han SJ, Lau CY, Berger MS and Parsa AT (2014).** Medical Errors in Neurosurgery. *Surgical Neurology International* **5**(10) 435–40.
- Schwappach DL (2015).** In the aftermath of medical error: Caring for patients, family, and the healthcare workers involved. *Bundesgesundheitsblatt, Gesundheitsforschung, Gesundheitsschutz* **58**(1) 80-86.
- Sportsman S and Hamilton P (2007).** Conflict Management Styles in the Health Professions. *Journal of Professional Nursing* **23**(3) 157–166.
- Van den Bos J, Rustagi K, Gray T, Halford M, Ziemkiewicz E and Shreve J (2011).** The \$17.1 Billion Problem: The Annual Cost of Measurable Medical Errors. *Health Affairs* **30**(4) 596–603.
- VanGeest Jb and Cummins Ds (2003).** An Educational Needs Assessments for Improving Patient Safety. *White Paper Report* 1–28.
- Woodtli AO (1987).** Deans of Nursing: Perceived Sources of Conflict and Conflict-Handling Modes. *The Journal of Nursing Education* **26**(7) 272–77.