

A survey of the quality of nursing services for brain trauma patients in the emergency wards of hospitals in Guilan Province, Iran (2012)

Seyed Ali Majidi¹, Ali Ayoubian², Sheida Mardani³, Zahra Hashemidehaghi^{4*}

¹ Lecturer, Ph.D. Student in Health Care Services Administration, Islamic Azad University, Rasht Branch, Rasht, Iran

² Hospital Management Research Center, Iran University of Medical Sciences, Tehran, Iran

³ M.A in Health Care Services Administration, Islamic Azad University, Sciences and Research Branch, Tehran, Iran

⁴ Eye Research Center, Tehran University of Medical Sciences, Tehran, Iran

Corresponding Author:

Zahra Hashemidehaghi, Eye Research Center, Tehran University of Medical Sciences, Tehran, Iran. Tel: +98.2182483250. Fax: +98.214247060. Email: Hashemi_Mitra@yahoo.com

Abstract

Background: Head trauma is the main cause of disabilities and death among young people, and the side effects of head trauma pose some of the greatest medical challenges. Rapid diagnosis and the use of proper treatments can prevent more severe brain damage. The purpose of this research was to determine the quality of nursing services provided to brain trauma patients in hospitals in Guilan Province, Iran.

Methods: The study was conducted as a descriptive, cross-sectional study in the emergency wards of selected hospitals in Guilan in 2012. The research population was comprised of all the brain trauma patients in these hospitals. We developed a two-section questionnaire, ascertained its validity, and determined that it had a reliability of 88% (Cronbach's alpha). Subsequently, we used the questionnaire for gathering data. The data were analyzed using SPSS statistical software, and descriptive analysis tests (frequency rate and average) and deductive analyses tests (chi-squared) also were used.

Results: The results showed that the quality of health services provided to brain-trauma patients in the emergency ward was at the moderate level of 58.8% of the cases and at a low level in 41.2% of the cases.

Conclusion: Based on the results that showed that the services were of moderate quality, the staff members in the emergency ward were required to update their knowledge and use the required measures to minimize or prevent side effects in brain-trauma patients; clearly, mastery of such measures was a real need among the emergency ward's staff.

Keywords: patients, brain injuries, nursing services, hospitals, emergencies

Additional Information for citing this article:

Title of Journal: Electronic physician; Abbreviated title of journal: Electron. Physician

doi: 10.14661/2014.747-753

Editorial information:

Type of article: original

Received: August.20.2013

Revised: 1st revision: September.10.2013; 2nd revision: October.02.2013; 3rd revision: November.24.2013

Accepted: December.01.2013

Published: February.01.2014

© 2014 The Authors. This is an open access article under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

1. Introduction

1.1. Background

The introduction of faster, more powerful cars and the increase in the number of young, inexperienced drivers inevitably have led to a surge in rate of car accidents and brain-trauma injuries. In 2000, brain-trauma injuries killed more than six million people in the world, of which 3.8 million were killed in accidents and 2.2 million died from intentional injuries (1). The severity of brain-trauma injuries is categorized with three levels, i.e., mild damage (Glasgow Coma Scale, GCS = 14-15), moderate damage (GCS = 9-13), and severe damage (GCS < 9) (2). Trauma is the leading cause of death among young people. Moreover, 50% of the trauma cases are caused by car accidents

and at least 40% of deaths are due to head injuries. Brain trauma refers to any damage caused by direct or indirect injury to the brain and related organs, and such injuries are the leading cause death in the West. The financial loss caused by brain-trauma injuries, in the USA alone, is about \$100 billion dollars per year (3). Out of the deaths that occur due to such injuries, 30% occur during the first 24 h in the hospital, and the main causes are damage to the brain, unstoppable bleeding, and the shock of the accident, which may eventually result in brain ischemia and secondary damage to the brain (4).

1.2. Statement of the problem

Researchers have shown that brain trauma is 2-4 times more prevalent among men than women and that people between the ages of 15 and 25 are more vulnerable to it. The main cause of death among people less than 24 years old is brain trauma (5). There have been several studies of the quality of healthcare services provided for patients who have brain damage, and there is general agreement that the implementation of standards for healthcare services would lessen the effects of such damage. One study reported that the majority of deaths among such patients occurred during the first 24 h of hospitalization. The study also concluded that the majority of preventable errors were related to the poor practices and conditions involved in handling and transporting the patients, poor inter-ward communication, delay in the provision of health services, inadequate supplies of ventilator, and delay in performing a CT-scan (6).

A study by Suttner et al. (2003) regarding healthcare management for trauma patients showed that several factors led to increased deaths among the patients, including inefficient services regarding stabilizing the air way, poor radiological surveys of the spine, the inability to correct hypotension, and also many other damages exerted during handling and transporting the patient. In 46% of the cases, the medical team failed to observe the minimum healthcare standards (7). There have been measures to impose standard procedures and protocols on the healthcare services provided to trauma patients, including brain-trauma patients. This is due to the recent evidence showing that the mortality rates in emergency wards were reduced by 9-30% after the implementation of standards for trauma health-care services (4, 8). Proper management of healthcare services for brain-trauma patients may prevent secondary damage, physical and mental disabilities after treatment, and death among the patients, which means less social-economic costs (9).

1.3. Objective of research

1.3.1. General objective

The objective of this research was to determine the quality of nursing-care services provided to brain-trauma patients admitted to emergency wards in Guilan-based hospitals in 2012.

1.3.2. Specific objective

The specific objective of the study was to determine the quality of the nursing-care services provided to brain trauma patients in the emergency ward. To accomplish this objective, surveys were conducted to acquire information about trauma patients, including age, gender, marital status, domicile, admittance date and time, cause of brain trauma, and profession.

2. Materials and methods

2.1. Research design and setting

This study was conducted in 2012 as a descriptive, cross-sectional study in in Guilan Province, Iran. The research population was all the brain trauma patients in the emergency wards of the selected hospitals. Hospitals were selected to participate in the study based on the requirements determined by the Ministry of Health, including:

1. Legal license
2. Evaluation certificate, with at least a first-grade rating for the last two years
3. Hospital evaluation certificate, with first-grade services (at least) in the intensive-care wards, including the Intensive Care Unit (ICU), Coronary Care Unit (CCU), Pediatric Intensive Care Unit (PICU), and the Neonatal Intensive Care Unit (NICU) (10).

The hospitals that met the criteria were the Poursina, Razi, Hefdah Shahrivar, Rasoul Akaram, and Amiralmomenan hospitals.

2.2. Sampling

2.2.1. Sample size

Based on the pilot study and preliminary estimates regarding the services status by the authors, it was determined that there were 400 participants.

$$n = \frac{pqz^2}{d^2} \quad n = \frac{0.5 \times 0.5 \times (1.96)^2}{0.05^2}$$

2.2.2. Sampling method

Samples were selected randomly and by using sequential sampling method. The criterion for being included as a sample was patients with brain trauma who died immediately after being admitted to the emergency ward or immediately after being sent to the intensive-care ward.

2.3. Measurement tool

A questionnaire of demographic information and a checklist of nursing healthcare services provided to brain trauma patients were used for gathering data. The questionnaire designed to acquire demographic information covered seven items, i.e., age, gender, marital status, domicile, admittance date and time, profession, and cause of brain trauma. The checklist of nursing healthcare to brain trauma patients consisted of 25 statements that measured the different aspects of the services based on three possible answers, i.e., Yes, No, No Idea. The healthcare services that were provided to brain-trauma patients were measured at three levels; 75-100%, good level; 50-74%, moderate level; and 0-49%, poor level.

In the process of content validity of the checklist, the statements of the checklist were revised and modified based a literature review and then provided to the members of the faculty boards at universities for final revision. The intra-observed reliability method was used to determine the reliability of the checklist. To do this, the subjects of the study were surveyed simultaneously by the author and a colleague, and, then, the results that were obtained in each survey were compared to measure the correlation of the responses using the Kappa correlation coefficient. The correlation was found to be 88%, which meant that the reliability of the survey was confirmed.

2.4. Data collection

The author and her colleagues went to the selected hospitals in Guilan Province during the morning, afternoon, and night shifts beginning in June 2012 and collected data through direct observations.

2.5. Ethical consideration

The following ethical measures were followed to ensure that our research work was conducted ethically, that the confidentiality of the participants was protected, and that any possible harm to the participants was minimized:

1. A license for conducting the study was secured from the Ethical Department of Guilan Medical Sciences University.
2. To ensure the confidentiality of the patients' information, the questionnaires were completed in a secure manner.

2.6. Statistical analysis

The data were analyzed in SPSS version 16 using descriptive and deductive statistics. For descriptive statistics, frequency tables and moderate and standard variables were used. The chi-squared test was used to compare the quality of the services provided to brain-trauma patients based on their gender, age, profession, marital status, and domicile.

3. Results

3.1. Demographic results

The data obtained regarding demographic information and the wards showed that 24.5% of the participants were women and 75.5% were men; 56% were married and 44% were unmarried; 45.2% were living in rural areas and 54.8% in urban regions; and 29% were unemployed and 71% were employed. Regarding admittance time, 33% were admitted in the morning, 48% in the afternoon, and 19% at night. The cause of brain trauma in 42.8% of the cases was car accidents, and 25.2% had been injured in motorbike accidents; the other cases had several different causes (Table 1).

Table 1. Demographic characteristics of study participants

Variables		n	%
Sex	Male	302	75.5
	Female	98	24.5
Age Group	< 30	197	49.2
	30-39	46	11.5
	40-49	58	14.5
	50-59	41	10.2
	> 59	58	14.5
Marital status	Married	224	56
	Single	176	44
Lodging	City	219	54.8
	Village	181	45.2
Job	Unemployed	116	29
	Housekeeper	70	17.5
	Employee	18	4.5
	Farmer	40	10
	Free	70	17.5
	Other	14	3.5

Table 2. Quality of nursing care based on demographic variables

Variables		Average		Weak		P-value
Age (Year)	< 30	111	56.3	86	43.7	P=0.2
	30-39	30	65.2	16	34.8	
	40-49	30	51.7	28	48.3	
	50-59	21	56.1	18	43.9	
	> 60	41	70.7	17	29.3	
Sex	Male	52	53.1	46	46.9	P=0.1
	Female	183	60.6	119	39.4	
Marital status	Married	138	61.6	86	38.4	P<0.01
	Single	97	55.1	79	44.9	
Lodging	City	118	53.9	101	46.1	P<0.003
	Village	117	64.6	64	35.4	
Admission	Morning	66	50	66	50	P<0.007
	Evening	128	66.7	64	33.3	
	Night	41	53.9	35	46.1	
Job	Unemployed	63	54.3	53	45.7	P<0.005
	Housekeeper	36	51.4	34	48.6	
	Employee	7	41.2	10	58.8	
	Free	41	59.3	28	40.6	
	Worker	55	74.3	29	25.7	
	Farmer	24	60	16	40	
	Other	9	64.4	5	30.7	

3.2. The results of the evaluation of the nursing care provided to patients with brain injuries

In general, 58.8% of the nursing care provided to brain trauma patients was at the moderate level when the patients were admitted to the hospital. Regarding the distribution of the quality of nursing-care services to brain trauma patients when they were admitted, 48.3% of the patients in the age range of 40-49 received poor quality services, and 70.7% of the patients older than 60 received good quality healthcare services. The results showed no statistically significant relationship between age of the patients in the wards we studied and quality of the services provided by the nurses ($P = 0.2$).

The results confirmed that the majority of men and women (58.5%) evaluated the quality of the service as being moderate quality, and no significant relationship was found between the quality of healthcare services and the

gender of the patients ($P = 0.1$). The majority of married participants (61.6%) received healthcare services of moderate quality, and no significant relationship was found between the quality of the services and marital status ($P < 0.1$). Among the patients who resided in rural areas, 64.4% received healthcare services of moderate quality, and 46.1% of the patients from urban areas received poor quality services; no significant relationship was found between the quality of the services received and the patients' dwelling places ($P < 0.03$). In addition, the results showed that 66.7% of the patients received healthcare services of moderate quality during the afternoon shift, and 50% received healthcare services of poor quality in the morning. No significant relationship was found between quality of the services and time of admittance ($P < 0.007$). Also, 58.8% of the white-collar patients and 74.3% of blue-collar patients received healthcare services of moderate quality. There was a significant relationship between the quality of the services rendered and work of the patients ($P < 0.05$) (Table 2).

4. Discussion

We found no similar studies that could be used to compare our findings with those in other healthcare centers. Therefore, in our discussion of the results acquired in our study, comparisons were made between our results and the existing standards for such services in hospitals. According to Baethmann, trauma is the main cause of death among people less than 40, and 50% of the deaths are due to brain trauma. Thus, it is reasonable to ensure that healthcare centers for trauma patients have adequate equipment and a well-trained staff. This would ensure the highest quality of healthcare for these patients (11). According to our results, the majority of the participants in the study (49.2%) were less than 30 years old; 75.5% were men, and 56% were married. Furthermore, 54.8% were residents of urban areas, and 48% of the patients with brain trauma were injured in car accidents.

Based on the findings, quality of nursing-care services for brain-trauma patients in the emergency ward was of moderate quality in 58.8% of the cases; in 41.2% of the cases, the services were of poor quality. These findings are consistent with those in Ebrahimi's study where he found that the majority of deaths from severe brain trauma were due to poor healthcare services (12). Several studies in other countries have found that patients have received poor healthcare services, resulting in death or disabilities, which may have been avoidable if adequate healthcare services had been provided (13).

The quality of nursing-care services provided to brain trauma patients upon their admittance to the emergency ward was surveyed based on demographic information (age, gender, marital status, residence place, and admittance date and time). Among the patients older than 60, 70.7% received healthcare services of good quality, and 48.3% of patients between 40 and 49 received poor quality healthcare services. The majority of the subjects (64.6%) from rural areas received moderate quality services, while 46.1% of the subjects from urban areas received poor quality health services. Moreover, 66.7% of the subjects admitted during the afternoon shift received poor quality services. Based on the work of the subjects, 58.8% were blue collar workers, and they received moderate quality health services.

Our results showed no significant relationship between the variables age, gender, and marital status and the quality of nursing-care services. However, a significant relationship was found between the variables domicile, time of admittance, and work and the quality of nursing care services. The results confirmed that the nurses paid more attention to safety and sterility concerns so that such concerns were observed properly. Services provided only by the nurses had lower error rates than services provided in cooperation with other medical teams (orthopedic, surgery, anesthesia, and physiotherapy) (14, 15).

Baranto Lamon stated that all the peripheral signals must be checked by the nurse after admitting a patient to the hospital, and any qualitative and quantitative disorders must be reported to the physician (16). In general, one may conclude from our results that the performance of the nursing staff was of moderate quality regarding trauma patients admitted to the emergency ward. Therefore, holding permanent training courses would surely contribute to the improvement of the quality of nursing services provided brain-trauma patients. This also would prevent undesirable side effects, such as disabilities and excessive costs. Studies by the Addebroc Institution in 1996 also confirmed that young people incur most of the closed brain trauma (17). This is consistent with our results, and it is probably due to increased number of vehicles on the roads, which results in increased numbers of car accidents. Our results showed that 42.8% of the injuries were caused by car accidents. Myburgh conducted a study in Australia and New Zealand and found that 61.4% of the cases of severe head trauma were due to car accidents (18).

5. Conclusions

Based on our findings, the performance of nurses in emergency wards regarding healthcare services to brain-trauma patients was at a moderate level of quality. The importance of this finding lies in the fact that the hospitals may improve the quality of health services if they consider these results. Therefore, it is recommended that permanent training courses be established for the staff in the emergency ward as an effective step toward improving the nursing-care service provided to brain-trauma patients. This measure may prevent many cases of disabilities and the heavy costs associated with further healthcare for brain-trauma patients. A supplementary study on the improvement of the quality of services in the hospitals based on accreditation models also is recommended for future studies.

Acknowledgments

The present article was prepared as a part of our research plan. The author expresses deep gratitude for the support provided by Islamic Azad University, Rasht Branch. We are also thankful for the contributions of the hospitals and of all the people who participated in this research.

Conflict of Interest:

There is no conflict of interest to be declared.

Authors' contributions:

All of authors contributed to this project and article equally. All authors read and approved the final manuscript.

References

1. Spahn D R, Cerny V, Coats TJ, Duranteau J, Fernández-Mondéjar E, Gordini G, et al. Management of bleeding following major trauma: a European guideline. *Critical Care*. 2007; 11:414. Pubmed PMID: 17298665
2. Stranjalis G, Bouras T, Korfias S, Andrianakis I, Pitaridis M, Tsaman douraki K, et al. Outcome in 1,000 head injury hospital admissions: the Athens head trauma registry. *J Trauma*. 2008;65(4):789-93. Pubmed PMID: 18849792
3. Yunesian M, Moradi A, Khaji A, Mesdaghinia AR, Zargar M. Evaluation of the effect of offender motorcyclists' penalty enforcement project on the incidence of road traffic accident injuries in Tehran. *Payesh*. 2007;6(1): 19-26.
4. Harrison-Felix C, Whiteneck G, Devivo MJ, Hammond FM, Jha A. Causes of death following 1 year postinjury among individuals with traumatic brain injury. *J Head Trauma Rehabil*. 2006; 21(1): 22-33. Pubmed PMID: 16456389
5. Jones PA, Andrews PJ, Midgley S, Anderson SI, Piper IR, et al. Measuring the burden of secondary insults in head-injured patients during intensive care. *J Neurosurg Anesthesiol*. 1994 Jan;6(1):4-14. Pubmed PMID: 8298263
6. Siddiqui AA, Zafar H, Bashir SH. An audit of head trauma a care and mortality. *J Coll Physicians Surg Pak*. 2004;14(3):173-7.
7. Suttner N, Price SJ. Have ATLS and national transfer guidelines improved the quality of resuscitation and transfer of head injury patients prospective survey from a region neurosurgical unit. *Aspos Ar Injury*. 2003;34(11):834-8. Pubmed PMID: 14580816
8. Ebrahimi Fakhar HR, Moshiri E, Zand S. An investigation on quality of emergency care of head injury patients in emergency ward, Vali-e-Asr hospital, Arak 2005. *Arak Med Uni J*. 2007; 10(4):1-12. [Persian].
9. Jeevaratnam DR, Menon DK. Survey of Intensive care of severity head injury patients in the United Kingdom. *BMJ*. 1996 April 13; 312(7036):944-7.
10. Terms and Conditions of Service Centers in Health Tourism, Office of Legal Affairs, Ministry of Health and Medical Education, 2009. [Persian]. Specific rules available at: <http://treatment.tbzmed.ac.ir/uploads/30/CMS/user/file/47/PDF/%D8%A2%D8%A6%D9%8A%D9%86%20%D9%86%D8%A7%D9%85%D9%87%20%D8%A7%D8%AE%D8%B0%20%D9%85%D8%AC%D9%88%D8%B2%20%D8%AE%D8%AF%D9%85%D8%A7%D8%AA%20%DA%AF%D8%B1%D8%AF%D8%B4%DA%AF%D8%B1%D9%8A%20%D8%B3%D9%84%D8%A7%D9%85%D8%AA.pdf>
11. Baethmann A, Chapunis D, Wirth A. System analysis of patient management during the pre-and early clinical phase in severe head injury. *Acta Neurochir suppl*. 1999;73:93-7. Pubmed PMID: 10494349
12. Ebrahimi Fakhar HR. Outcome of patients with severe brain trauma in Vali Asr hospital on the Glasgow outcome scale. *Arak Med Uni J*. 2009; 12(4):9-1. [Persian].

13. Zargar M, Zafarghandi MR, Modagheh H, Abbasi K, Razai Shiraz H. Significance of trauma mechanism and its effect on the outcome of trauma patients. *Tehran Univ Med J.* 1998; 5(56): 108-11.
14. Matta b, Menon D. Severe head injury in the United Kingdom and Ireland: a survey of practice and implications for management. *Crit Care Med.* 1996 Oct;24(10):1743-8. Pubmed PMID: 8874315
15. Femal MF, Keizum MS. Evaluation of the security of head injury nursing anatomic and indices. *Rever Esc Enferm.* 1996; 30(1):116- 37.
16. Hossein Rezaiee H, Khada Bandeh S, Nikian YA. Quality of care airways of head injury in emergency ward of Bahonar hospital in Kerman City. *Gilan Med Uni J.* 2005;13(52):29-36. [Persian].
17. Phipps W, et al. *Medical Surgical Nursing Care Planning Guides.* 4th ed. Philadelphia: WB Saunders, 1998:252-69.
18. Myburgh JA, Cooper DJ, Finfer SR, Venkatesh B, Jones D, Higgin S, et al. Epidemiology and 12-month outcomes from traumatic brain injury in Australia and New Zealand. *J Trauma.* 2008; 64(4):854-62. Pubmed PMID: 18404048