

Research Article

Neurosurgical Nurses Evaluations of the Guidance they have Provided for Traumatic Brain Injury Patients Family Members in Relation to the Symptoms and Consequences of TBI

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Submitted: 30 July 2015

Accepted: 14 October 2015

Published: 01 November 2015

ISSN: 2379-9501

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Keywords

- Brain injuries
- Patients
- Family
- Nursing staff
- Guidance

Abstract

This study has investigated Finnish nurses' evaluations of the guidance provided for traumatic brain injury patients' family members in relation to the symptoms and consequences of TBI. The data was collected during 2010 from neurosurgical nursing staff of five Finnish University Hospitals (N = 172). The response rate was 67 % (n = 415).

The surveyed nurses responded that they regularly provide guidance for TBI patients' family members in line with their responsibilities. However, only about one third of respondents reported that they regularly advice family members about symptoms caused by rise in intracranial pressure. Nursing staff with less than three years of work experience generally responded that they only seldom provide guidance for family members about the consequences of TBI.

It is hoped that the study's findings will be applied in the planning of specialized courses, in-service training and orientation provided for neurosurgical nursing staff.

ABBREVIATIONS

TBI: Traumatic Brain Injury; FM: Family Member; ICP: Intracranial Pressure

INTRODUCTION

Traumatic brain injury (TBI) is a non-congenital insult to the brain from an external mechanical force, possibly leading to permanent or temporary impairment of cognitive, physical, and psychosocial functions, with an associated diminished or altered state of consciousness. TBI invariably affects the patient's behavior by weakening their body functions and causing different sensomotoric, cognitive and emotional disorders always [1,2]. Annually, almost eight million persons sustain TBI worldwide [3]. In Finland, between 15 000 and 20 000 people suffer from

TBI annually, and it is the primary cause of death of about 1,000 persons a year. A pronounced rise in intracranial pressure (ICP) is the most commune cause of mortality in relation to TBI within the first two weeks and there is a significant association between ICP compliance and reduced mortality [4].

According previous studies, TBI patients' family members (FM) need information both during the immediate acute phase of injury treatment in an intensive care ward, and during the subsequent rehabilitation period [5-7]. There is therefore a need for more research on how people can be helped to cope with TBI patients who exhibit symptoms such as aggressive behavior or difficulties in understanding speech [8,9]. Further research is also required on neuroscience nursing care, on the management of TBI symptoms, and prevention of secondary injuries [10-12]. FMs are

evidently increasingly likely to demand action from nurses and question their skills [13]. Moreover, nurses and family members may have different expectations concerning how information on TBI patients' treatment is shared [14]. Nurses need wide-ranging skills to be able to both care for the TBI patient and assist their family members, nursing care of TBI patient and encounter of their FMs in the neurosurgical ward requires a wide expertise of nurses.

Previous studies have indicated that almost all family members require information about TBI as a disease and its consequences [15,16] at least once a day [14]. FMs wish to have accurate, reliable and consistent information [6,14,15]. TBI patient's FMs tend to feel either that they do not get enough useful information to support their decision-making [17], or that the facts provided are not appropriate [15,18]. Providing precise information can be challenging, however, since TBI patient's status is often unstable [2].

FMs particularly need guidance on the condition of the patient and the treatment of TBI, not least because of the TBI patients themselves may underestimate the injury's impact on their own thinking and behavior [21]. TBI patient's personality and behavioral changes, such as increased aggression, irritability and memory loss, may well be a cause of stress, grief, fear and anxiety to FMs [5,15]. It is also important for family members to perceive that the patient is receiving the best care possible [15], and that none of their injuries are ignored. They also typically wish to know about the TBI patients medication [14]. Family members additionally expect to be given information about patient's potential problems, as well as help in preparing for worst-case scenarios such as the patient's death [7]. In some cases family members have also reported that they were not adequately warned about potential complications [14]. The purpose of this study was to find out how neurosurgical nurses evaluate they guide TBI patients' FMs about symptoms and consequences caused by TBI.

Research survey questions:

1. How often do members of nursing staff in your unit guide TBI patients' family members about the symptoms and consequences caused by TBI?
2. According to your nursing staff's evaluations, what kind of competence (basic/advanced) is needed when guiding patients' family members concerning the symptoms and consequences of TBI?
3. Do variable factors related to the background of members of nursing staff (age, education, work experience in nursing, work experience in current work unit) affect how they evaluate their level of competence?

MATERIALS AND METHODS

Survey questionnaires were sent to all nursing staff members (N=172) from the neurosurgical wards of Finland's five university hospitals (six wards in total) in accordance with these hospitals protocols. The data was collected in April 2010 and finished in July 2010. The respondents returned completed questionnaires to the researcher by mail. In total 115 of the nursing staff returned the questionnaire, so the response rate was an impressive 67%.

The results form part of a wider research project related to the support provided for TBI patients FMs. In this article compiles previously unpublished findings on responses made by nurses to 17 statements listed on the survey questionnaire. Findings compiled from responses to 22 other statements from the survey questionnaire, related to informational support, have been published elsewhere [22]. The statements used on the questionnaire were drafted on the basis of previous research and literatures were based on previous research and literature [23]. The assessment scale was evaluated by a team of experts consisting an anesthesiologist, a neurosurgeon, a nurse manager, licensed practical nurse, and two registered nurses). Two nurses with long experience in neuroscience nursing tested the cover letter and the questionnaire. Several changes were made on the basis of their evaluations: e.g. limits were removed from statement "I'll tell to TBI FMs why the TBI patient's blood sugar levels are monitored, the limits were removed. The questionnaire additionally contained five questions on respondents' background (gender, age, education, work experience, work experience in neurosurgical ward) and 84 statements considering informational, emotional and practical support. The statements were rated by respondents on six-point scale: 5 = always 4 = often 3 = sometimes 2 = seldom 1 = never, 0 = does not affect to me. (Table 1)

Data analysis

The data was analyzed using statistical program SPSS for Windows. Descriptive statistics (frequencies, means, standard deviations) were first calculated and examined. The age groups and education groupings were then reclassified for further analysis. Factor analysis was carried out using the principal axis factoring method with Varimax rotation, and eigen value greater than one. All responses to statements of "0 = does not affect me" were excluded from the factor analyses. Four factor solutions considering guiding TBI patients FMs about TBI's symptoms and consequences were created regarding the guidance provided for TBI patients' family members about the symptoms and consequences of TBI. All communalities except one were over 0.3 and varied between 0.29–0.88. A four factor solution explained 51.5 % of the data. The factors were named as follows: F1 Guidance about the TBI consequences of TBI patient's condition (15.4 %); F2 Guidance in relation to nursing interventions (15.3 %); F3 Guidance provided according to nurses' responsibilities allocated to them (10.4 %); F4 Consistent information concerning complications (10.2 %). The sum variables were constructed and the mean, highest and lowest values and Cronbach's alpha coefficients were calculated for the nursing intervention sum variables (0.63–0.83). The Kolmogorov-Smirnov test indicated that distributions were normal. The nursing intervention sum variables were also examined together with background variables by analyzing their relationships to how the nursing staff evaluated guidance provided to family members on neurosurgical wards. In addition, the relationships and interactions between background variables and the intervention sum variables were examined using One Way ANOVA [24].

RESULTS

Most of the respondents were women (97 %). The ages of respondents ranged 21 to 62 years, with a mean age of 40

Table 1: Nursing staff: background information (respondents n = 115).

Background variables		n	%
Gender (n = 113)	Female	109	97
	Male	4	3
Age (n = 112)	35 years or under	39	35
	36–45 years	35	31
	46 years or over	38	34
Education (n = 114)			
	Licensed practical nurse	18	16
	Registered nurse trained at a college of nursing	51	45
	Registered nurse trained at a university of applied sciences	45	39
Work experience as a nursing staff member			
(n = 115)	Less than 3 years	11	10
	3- 10 years	34	29
	11- 20 years	36	31
	21 years or more	34	30
Work experience as a nursing staff member in current hospital unit			
(n = 115)	Less than 3 years	25	22
	3- 10 years	44	38
	11- 20 years	24	21
	21 years or more	22	19

Table 2: Compiled responses to the survey questionnaire on the guidance provided by nurses to TBI patients' family members about the symptoms and consequences of TBI.

	Nursing staff's evaluations		
	Often % (n)	Seldom % (n)	Total
Guidance provided according to nurses' responsibilities allocated to them (mean=4.21; sd=±0.56; α=.63)			
I inform family members about TBI patients' conditions according to the responsibilities allocated to me (n=114)	96 (109)	4 (5)	100
I inform family members about TBI patients' treatments according to the responsibilities allocated to me (n=111)	93 (78)	7 (33)	100
I tell TBI patients' family members that the documentation about the patient's treatment is produced taking into account the TBI patient's opinion (n = 114)	93 (106)	7 (8)	100
Guidance about the consequences of TBI patients' condition (mean=3.61; sd=±0.56; α=.76)			
I tell TBI patients' family members that their injuries may cause difficulties in understanding their speech (n=112)	83 (93)	17 (19)	100
I inform TBI patients' family members when a rapid change in the patient's condition occurs (n=112)	80 (90)	20 (22)	100
I tell TBI patients' family members that patients need to be given enough time to express themselves (n=114)	74 (84)	26 (30)	100
I tell TBI patients' family members that their injuries may result in aggressive behaviour (n=114)	59 (67)	41 (47)	100
I explain to TBI patients' family members why their blood sugar levels have to be regularly monitored (n=114)	45 (51)	55 (63)	100
I take the family's viewpoint into consideration when preparing TBI patients' nursing plans (n=111)	15(17)	75 (94)	100
Consistent information concerning complications (mean=3.49; sd=±0.75; α=.75)			
I make sure that the information I give to TBI patients' family members does not contradict the information given by others (e.g. the attending physician, other staff members) (n=114)	84 (96)	16 (18)	100
I explain to TBI patients' family members how pneumonia is prevented (n=110)	40 (44)	60 (66)	100
I explain to TBI patients' family members how hand swelling is prevented (n = 109)	34 (37)	66 (72)	100
Guidance in relation to nursing interventions (mean=3.45; sd=±0.70; α=.83)			

I inform TBI patients' family members that I give patients fever-reducing medication if their body temperature is elevated (n=112)	79 (88)	21 (24)	100
I inform TBI patients' family members about the symptoms of brain edema (n=109)	49 (54)	51 (55)	100
I inform TBI patients' family members that I am taking care of the patient's fluid replacement therapy according to my responsibilities (n = 111)	61 (68)	39 (43)	100
I explain the non-medicinal means of lowering body temperature to TBI patients' family members (n=112)	35 (39)	65 (73)	100
I tell TBI patients' family members about the symptoms caused by rises in intracranial pressure (n=112)	34 (38)	66 (74)	100
5=always, 4=often, 3=occasionally were reclassified as "often" and 2=seldom; 1= never were reclassified as "seldom" SD: Standard Deviation; α : Cronhbach's alpha reliability coefficient			

years. Most of the respondents were registered nurses (84 %), remainders were licensed practical nurses. Of the respondents 61 % had been working as a nurse 11 years or more, while 40 % of respondents had been working on their current neurosurgical ward for 11 years or more (Table 1).

Guidance provided according to nurses' responsibilities allocated to them (mean 4.21; $sd\pm 0.56$) was realized often according nursing staffs assessments. Almost all of the nurses evaluated they told to the TBI patients' FMs about the condition (96 %) and its treatment (93 %) often. Documentation concerning TBI patients care from the TBI patients' subjective point of view was also evidently often provided (93 %). **Guidance about the TBI consequences of TBI patient's condition** was also provided often (mean 3.61; $sd\pm 0.57$). Nurses responded that they often explain to family members TBI can make it difficult for patients to understand speech (83%), and that TBI patients need to be given time to express themselves (74%). 59% of nursing staff reported that they explain to family members that brain injuries can cause aggressive behavior. Only 15% of the nurses considered that they often take TBI patients' family members' viewpoint into consideration when preparing nursing plans. **Consistent information concerning complications** (mean 3.49; $sd\pm 0.75$) is often given to family members. Only just over one third of the nurses reported that they often tell family members about how to prevent pneumonia (40%) or hand swelling (34%). **Guidance in relation to nursing interventions** was generally not provided often (mean 3.45; $sd\pm 0.70$). One third of the nurses (34%) reported that they often tell family members about the symptoms caused by an increase in intracranial pressure (Table 2).

Respondents felt that basic nursing competence is sufficient to enable nurses to provide guidance to TBI patients' family members in accordance with their responsibilities (65%), to give them consistent information concerning complications (57%), and to inform them about nursing interventions (69%). Contrastingly, they generally felt that nurses require advanced competence to give family members guidance concerning TBI's effects on patients (52%), how TBI can cause aggressive behaviour and difficulty understanding speech, and the symptoms caused by an increase in intracranial pressure.

Nursing staff aged 46 or over generally reported that they provide guidance for TBI patients' family members more often than those in younger age groups ($p < .031$). Nurses with less than three years of work experience reported that they provide guidance for family members about the injury's consequences for the patient's condition ($p < .045$) or consistent information

concerning complications ($p < .034$) less often than nurses with three or more years of work experience.

DISCUSSION

Ethical considerations

Permission to conduct the study was obtained from each of the five organizations involved, according to ethical principles and protocols for such research. The participation of the nursing staff surveyed in the study was based on their informed consent. The covering letter accompanying the survey questionnaire informed participants about the voluntary nature of their participation, and assured them about the confidentiality and anonymity of their responses. Contact information for the research group was attached to each questionnaire so that participants could ask any questions or make comments regarding the study. The anonymity of the participants was safeguarded by collecting replies returned without respondents' names. The resulting data has been handled with absolute confidentiality, and the results have been published in a way that precludes the recognition of individual participants. Any identification information will be removed from the research data as soon as the study's findings have been validated. The results of the study have been published in an objective, open and honest manner [24].

Nursing staff members reported that they often tell to TBI patients' family members how such injuries can make it difficult for patients to understand speech, and mean that they need time to express themselves. The nurses also felt that they often tell family members about the likelihood of aggressive behavior. Family members assume that nursing staff will consider their learning needs [17], because aggressive behavior and difficulties to understand speech of the TBI patient causes insecurity [19] and stress to them [15]. To FMs it is crucial to get information about the TBI patients situation at least once a day [15,17,19], because it is less stressing for them when they are regularly assured that the patient is receiving the best possible care [14, 15].

Only one third of respondents reported that they often tell TBI patients' family members about the likelihood of pneumonia or hand swelling as a complication of TBI. However, it is clearly important for family members to know that pneumonia is the one of the most typical complications caused by TBI, and that the risk of pneumonia increases when bed rest is prolonged. Hand swelling can be prevented by taking care of the hand posture and through physiotherapy. Almost all respondents felt that they ensure the information they give to family members is

consistent with information given previously. Family members have highlighted the importance to them of getting consistent information about TBI patients' condition and treatment [19]. Family members also wish to be well informed about possible complications, so they can be prepared to deal with them [17].

Only one third of respondents reported that they tell family members about the symptoms of intracranial pressure, even though ICP is an important source of secondary injuries [2] and FMs presence may reduce risks [25]. Nursing staff evaluated that guiding TBI patient's FMs about behavior changes like aggressive behavior, or brain swelling symptoms or TBI patient's difficulties to understand speech required advanced competence. Nowadays FMs can be very demanding and question nursing staff's knowledge and nursing skills [26] on the other hand nursing staff think they don't have enough knowledge about TBI [27].

CONCLUSION

The generalizability of the results may be weakened by the small sample size [29]. It is also possible that the nurses' responses reflect the intentions behind their actions rather than their actual practical effects. Respondents may also have answered according to what they consider would be an ideal situation [24].

The reliability of the questionnaire was tested using explorative factor analysis, and a model incorporating eight factors was selected. The internal consistency of the statements focusing on the informational guidance provided for TBI patients' family members, as tested with Cronbach's alpha coefficient, was good, with the values for sum variables ranging from 0.63 to 0.83. The reliability of the results was assured by including in the study all of the university hospital neurosurgical wards where TBI patients are treated in Finland [28].

The reliability of the study was assessed on the basis of its validity, thus ensuring that it effectively measured nursing staff members' assessments of the guidance provided for TBI patients' family members. The content validity covers the provision of guidance provided according to nurses' responsibilities allocated to them; guidance about the consequences of TBI and patients' condition; consistent information concerning complications, and guidance on nursing interventions. External validity was achieved by inviting all of the licensed practical nurses and registered nurses from the neurosurgical wards of all five Finnish university hospitals to participate in the study [24]. The validity of the questionnaire content was verified by basing the statements in the questionnaire on previous research on the subject and evaluations conducted by a team of experts. In addition, two nurses pre-tested the questionnaire. In their opinion the questionnaire did not lack anything essential, the statements were clear, and the questionnaire was easy to answer. The response rate in the study was 67%, which is rather good [28].

The findings of this study are particularly relevant for the planners of specialized courses, in-service training and orientation provided for neurosurgical nursing staff. Such training should duly account for the problems caused to family members by TBI patients' symptoms, and the related need for guidance. Training should enhance nurses' competence and enable them to help family members cope with patients'

challenging behavioral changes such as increased aggression, irritation and memory disorders. The study's findings identify the issues that are important for new nursing staff members who need to deal with TBI patients' family members, who particularly need guidance on TBI's challenging consequences and symptoms, including difficulty in understanding speech and behavioral changes. It should also be noted when planning training that only a few nurses reported that they often take TBI patients' family members' views into consideration when preparing nursing plans.

The survey results indicate that the levels of guidance provided for TBI patients' family members vary considerably between members of nursing staff, though overall the levels of guidance provided are good. Providing TBI patients' family members with the necessary guidance requires a wide range of multidisciplinary knowledge and nursing skills. Challenges for future research include the need to examine neurosurgical nursing staff's competence levels and to assess the learning needs of TBI patients and their family members in the context of neurosurgical hospital wards. In future research will also need to examine opportunities for web-based tele-health guidance and interventions to support TBI patients and their families, and to investigate how this may affect the quality of life of both patients and family members.

The results indicated most often nurses evaluated they guided according responsibilities allocated to them. Thus nurses evaluated they told to the TBI patients' FMs about the condition and treatment. Nurses stated that advanced competence was needed when guiding TBI patient's FMs about behavior changes like aggressive behavior, or brain edema symptoms or TBI patient's difficulties to understand speech.

ACKNOWLEDGEMENTS

This study was supported by grants from Laurea University of Applied Sciences, The Finnish Brain Research and Rehabilitation Center, University of Eastern Finland. We are grateful to all nurses who participated in the study. We also thank Statistician, MSC Hannulsoaho for assistance with the statistical analysis.

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Cite this article

Coco K, Tossavainen K, Jääskeläinen JE, Turunen H (2016) Neurosurgical Nurses Evaluations of the Guidance they have Provided for Traumatic Brain Injury Patients Family Members in Relation to the Symptoms and Consequences of TBI. *Ann Nurs Pract* 3(1): 1037.