La construcción y validación de instrumento de colección de datos para víctimas de trauma craneoencefálico

Maria do Carmo de Oliveira Ribeiro1, Carlos Umberto Pereira2, Ediline Curvelo Hora3, Mariangela da Silva Nunes4, Cássia Barbosa da Silva5, Deisiane Santana dos Santos6

ABSTRACT

Objective: to develop and to validate an instrument of data collection for victims of traumatic brain injury. Methods: this is an exploratory study performed at the Intensive Care Unit of a public hospital of Aracaju, Sergipe, Brazil, reference for the assistance of trauma victims. The development and validation of the instrument of data collections occurred from June to October of 2007 after the approval of the Ethics and Research Committee of the Federal University of Sergipe, (nº CAAE-0068.0.107.380-05). Four nursing teachers and eight nurses from the Intensive Care Unit participated in the validation. For the development of the instrument of data collection, it was utilized the methodological referential proposed by Horta and semiology basis. The validation process of the instrument occurred in two stages in which there were suggestions and adjustments needed. Results: the instrument of data collection was considered validated relating to the appearance and content with a value higher than 75% for each item evaluated, as recommended by literature. Conclusion: the development and validation of an instrument of data collection based on a theory permitted the identification of 25 nursing diagnoses in victims of traumatic brain injury, which favors the implantation of the remaining stages of the Nursing Care System. Descriptors: nursing theory; validation studies; nursing care; brain injuries.

RESUMEN

Objetivo: construir y validar un instrumento de coleción de datos para las víctimas de trauma craneoencefálico. Métodos: se trató de un estudio exploratorio desarrollado en la Unidad de Terapia Intensiva de un hospital público de Aracaju, Sergipe, Brasil, referencia en asistencia a las víctimas de trauma. La construcción y validación del instrumento de coleción de datos ocurrieron de junio a octubre de 2007 tras la aprobación del Comité de Ética de la Universidad Federal de Sergipe, (nº CAAE-0068.0.107.380-05). Participaron de la validación cuatro docentes de enfermería y ocho enfermeras de la Unidad de Terapia Intensiva. Para la construcción del instrumento de coleción de datos se utilizó el referencial metodológico propuesto por Horta y bases de la semiología. El proceso de validación del instrumento ocurrió en dos etapas en las cuales hubo sugerencias y adecuaciones necesarias. Resultados: el instrumento de coleción de datos fue considerado valido cuanto la aparición y al contenido con un valor superior al 75% para cada ítem avaliado, según preconizado en la literatura. Conclusión: la construcción y validación del instrumento de coleción de datos permitió la identificación de 25 diagnósticos de enfermería en víctimas de trauma craneoencefálico, lo cual favorece la implantación de las demás etapas de la Sistematización de la Asistencia de Enfermería. Descriptores: teoría de enfermería; estudios de validación; cuidados de enfermería; traumatismos encefálicos.

RESUMEN

Objetivo: construir y validar un instrumento de colección de datos para las víctimas de trauma craneoencefálico. Métodos: se trata de un estudio exploratorio desarrollado en la Unidad de Terapia Intensiva de un hospital público de Aracaju, Sergipe, Brasil, referencia en asistencia a las víctimas de trauma. La construcción y validación del instrumento de colección de datos ocurrieron de junio a octubre de 2007 tras la aprobación del Comité de Ética de la Universidad Federal de Sergipe, (nº CAAE-0068.0.107.380-05). Participaron de la validación cuatro docentes de enfermería y ocho enfermeras de la Unidad de Terapia Intensiva. Para la construcción del instrumento de colección de datos se utilizó el referencial metodológico propuesto por Horta y bases de la semiología. El proceso de validación del instrumento ocurrió en dos etapas en las cuales hubo sugerencias y adecuaciones necesarias. Resultados: el instrumento de colección de datos fue considerado valido cuanto la aparición y al contenido con un valor superior al 75% para cada ítem evaluado, según preconizado en la literatura. Conclusión: la construcción y validación del instrumento de colección de datos basado en una teoría permitió la identificación de 25 diagnósticos de enfermería en víctimas de trauma craneoencefálico, lo cual favorece la implantación de las demás etapas de la Sistematización de la Asistencia de Enfermería. Descriptores: teoría de enfermería; estudios de validación; atención de enfermería; traumatismos encefálicos.
INTRODUCTION

Traumatic brain injury (TBI) is responsible for a great impact on the health of the population in general, with high rates of morbidity and mortality, especially in young adults, with consequences of cognitive, behavioral and psychological effects in the survivors. Investigators affirm that the injuries presented by TBI victims signal the necessity of setting up protocols with the objective of minimizing the effects, as well as favoring the creation and implementation of prevention strategies that reduce risks resulting from the traumatic injury.1-3

Among the measures necessary for the victims of TBI are continual assistance and internment in an Intensive Care Unit (ICU), with the objective of avoiding secondary damage, to maintain the metabolic and respiratory stability of these victims.4 It is believed that the systematization of the care of TBI victims through a theory can make possible the individualization of care and, consequently, a quality presence.5

For implementation of the nursing process, the choice of a theory that orientates nurses regarding the necessities of each patient is necessary, as well as the training of the nursing professionals for the execution of the systematization of nursing care (SNC).6 The use in a systematic way of the nursing process improves the quality and directs the care, avoids omissions and unjust repetitions, as well as allowing better visibility of the nursing professionals.7-8

It is emphasized that it is necessary, before the implementation of SNC, to create a data collection instrument specifically for determined customers, which makes possible the identification of problems and nursing diagnoses, as well as the establishment of the interventions and results of nursing. The theory of Basic Human Needs (BHN) of Horta favors the identification of objective and subjective data and allows the preparation of the care plan, especially for serious patients.9 10

The creation of a data collection instrument based on a theory facilitates the acquisition of objective and subjective data of the patient and serves to orient the preparation of the individualized care plan for stable or unstable patients. Consequently, it allows communication between health professionals, making it possible to better understand the importance of the systematization of the collection of data and supporting research.10-1

The motivation for this study appeared during the college teaching of nursing, when it was realized that no instrument of data collection existed that would allow the identification of the nursing diagnoses in victims of TBI. A search was done of the national and international indexed literature, and articles were found related to the subject. But no local level study was identified. In this context, the research is justified by the lack of studies with this specificity in our state and by the expectation that the construction and validation of a special data collection instrument for these patients could support nurses in the identification of nursing diagnoses. It is believed that the results of this study could help the nurses in the identification of the problems and diagnoses of nursing of these victims, as well as support care planning. In this way, the objective of this study was established to build and to validate a data collection instrument for victims of TBI.

OBJECTIVE

- To construct and validate an instrument to collect data for TBI.

METHOD

An exploratory study, developed in the ICU of the Emergency Hospital of Sergipe “Governor João Alves Filho” (HUSE), located in Aracaju, Sergipe, Brazil, a reference in the service to trauma victims in the State. In the ICU of HUSE there is no data collection instrument which allows the identification of the problems of nursing, or nursing diagnoses.

The creation and validation of the data collection instrument took place from June to October of 2007, after the approval of the Committee on Ethics and Research Involving Human Beings of the Federal University of Sergipe under nº 0068.0.107.380 CAAE-0068.0.107.380-05. All the participants of the study signed the Free and Informed Consent Form (FICF) as determined by Resolution 196 of 10 of October of 1996, of the National Council of Health, Ministry of Health.12

The cases were, for convenience, constituted of four nursing teachers, with experience in teaching Systematization of Nursing Care and eight nurses of the ICU of HUSE with experience in assisting critical patients.

For the construction of the data collection
The development and validation of instrument for the TBI victim the reference system methodology based on serving basic human needs was used, specifically the psychobiological and psychosocial needs, as well as a bibliographical finding based on semiology.

The initial part of the data collection instrument consists of information on: relevant data of identification, like age, record number, time of hospital internment, sex, marital status, birthplace, nationality, place of the accident, external cause, and time passed between the trauma and the specialized service, examinations and type of treatment received. For the categorization of the external causes the International Classification of Diseases (ICD 10) was used.

The second part contains data referring to the categories: psychobiological and psychosocial needs. The subcategories were grouped in the following way: necessities of oxygenation/respiration, circulation, thermoregulation, hygiene, tissue integrity, sensory perception, nutrition and elimination. The psychosocial necessities of the victims of TBI can be evaluated through the physical examination and record data.

In the third part of the instrument there is information on the use of invasive and non-invasive monitors, catheters, aside from space intended for the results of diagnostic examinations and the evolution of nursing.

To proceed to the measurement of the validity of the proposed instrument, an instrument of evaluation was prepared for the judges (specialists) with questions on adaptation of the technical terms, suggestions for inclusion and exclusion of items and observations.

The validity is an important characteristic which the instrument must have and which tells the degree to which it measures and presumes to measure. Besides, the validity has a number of different aspects and methods of evaluation.

In this study, the validity of content and appearance was realized. The validity of the content must be the first type of validity to be established, being the prerequisite for all the types of validity, since it does not require any type of statistical treatment and shows how representative the questions of the instrument are inside the universe of all the questions that might be made on the specific subject.

The validity of appearance or of face must not be used as an isolated criterion to judge the validity of an instrument. It is a subjective evaluation that judges the clarity, ease of reading and the form of presentation of the instrument. Consequently, it is an informative evaluation of the apparent validity for those who will use the instrument.

Initially four involved in the teaching of nursing participated in the validation of the data collection instrument, one being a doctor, two masters and one master’s student, all with experience in teaching of SNP.

In this study, teachers of the nursing area with experience in teaching of nursing diagnosis and the nurses of the ICU of HUSE were considered validators or judges.

The process of validation of the judges took place in the following way: after signing the Free and Informed Consent Form (FICF), the form for evaluation of the TBI victim based on the Basic Human Needs model and on semiology was handed to same, besides the form for validation of the instrument for evaluation of the TBI victim. The latter was intended to orientate them during the process of validation.

After the devolution of the validation forms, it was noticed that there was need for reformulation of the data collection instrument, owing to the high degree of disagreement on the part of the judges. So, all the corrections were done and subsequently, the second stage of the validation began with revaluation by the same. At this moment, the participation of eight nurses of the ICU was included also.

Each item of the questionnaire was evaluated by simple frequency and the descriptive statistic was used for the presentation of the results. The items of the questionnaire were evaluated in the following way: I agree, disagree and suggest changes, the validators being asked to point to suggested changes.

RESULTS

The first phase of the validation, carried out with four teachers of nursing, explored their opinion regarding the adaptation of the technical terms employed in the form, agreement being observed by three judges, while one stated that it was partially adequate.

Agreement being observed by three judges, while one stated that it was partially adequate. When questioned if the number of items of information in the form was sufficient for the identification of nursing diagnoses, 75% of the judges agreed and 25%...
disagreed, pointing to suggestions such as: add evaluation of the psychospiritual and psychosocial needs, information on hydroelectrolitic disorders and to consult the North American Nursing Diagnosis Association (NANDA) to make future identification of nursing diagnoses easy.

As for the clarity of the items, only 25% of the judges agreed. When questioned about the inclusion or exclusion of items or questions it was suggested that information be added on the evaluation of the Glasgow Coma Scale (GCS), presence or absence of defecations and characteristics of same, evaluation of the urinary system, presence or absence of tracheotomy, information on vision, audition, speech and sensibility, hemoptysis, fractures, blowing, abdominal percussion, scoliosis and lordosis, injuries and/or warts, as well as to include cachexy and obesity.

Other suggestions mentioned by the judges were: to optimize underutilized spaces, besides substituting the comment and observations gap with evolution of nursing. The judges mentioned that the instrument had a good appearance, was objective and/or easy to fill out, besides presenting good aesthetics, with letters of appropriate size.

In the suggestions item the judges proposed the inclusion of socio-demographic data in the characterization of the sample, including race and level of schooling, and to transfer Cardiac auscultation to the monitoring item. Other aspects were also pointed out as important, to include the substitution of signs and symptoms with basic human needs, the condensation of the spaces for Cardiac auscultation and the removal of the word ‘serious’ from the title of the form. Beyond this, the judges emphasized as essential to include the participation of ICU nurses in the process of validation of the instrument.

Modifications were made also in the form for evaluation of the judges, for validation of the instrument. In this new instrument, each item investigated consisted of the following questions: technical terms used, content, appearance and agreement with the proposed model.

It is worth pointing out that, in this study, the value of 75% of positive answers was established to be considered validated by the judges, according to a similar study that used this value for the validation of the interview instrument.  

As for the item identification of the patient, 91.7% of the judges agreed without restrictions; and one asked to include the name of the patient. However, in accordance with Resolution 196/96 that guarantees the secrecy of those investigated, it was opted to not respect this suggestion.

Regarding the items place of accident and external cause there was 100% of agreement according to the evaluation of the judges. In what refers to the time passed between the trauma and the specialized service, 91.7% agreed, the necessity being indicated, however, of including the intervals of time (2 to 3 hr; 4 to 5 hr; 6 to 7 hr; 8 to 11 and 12 to 13 hr), to measure the time elapsed between the trauma and care of the victim.

Regarding the conducts used, there was agreement of 91.7% between the respondents; meantime one evaluator suggested adding orthopedic treatment and other types of surgeries.

The aspects oxygenation/respiration necessities were approved by 91.7% of the evaluators, with suggestion for the improvement of the appearance in the sequence of the technical terms. As for the item on circulation necessity, 83.3% of the judges showed agreement referring to it and 16.6% suggested the removal of the information palpitation of cardiac auscultation and the addition of the terms tachycardia and bradycardia, besides the importance of leaving a space reserved to register the values of average Blood pressure (ABP) and of intracranial pressure (ICP).

For the necessity of thermoregulation, there was agreement of 91.7% with the inclusion being suggested of space for registry of the temperature. Regarding the necessity of hygiene there was agreement in 100% among the evaluators. In the item integrity necessity, there was agreement of 91.6%. One of the judges suggested that information on jaundice and cutaneous paleness be added. For the necessities of sensory perception and of physical mechanics there was agreement of 100%.

In the item need for integrity, there was a 91.6% concordance, one of the judges suggested that they added information about jaundice and cutaneous paleness . For the sensory perception and body mechanics needs there was a 100% agreement.

In what concerns the necessity of nutrition/hydration, almost a totality, 91.7% agreed, including information on open probe and nutritional state preserved being presented as suggestion.
There was 100% of agreement between the judges on the following questions: evaluations of elimination and psychosocial necessities use of invasive and non-invasive monitors, results from diagnostic examinations and evolution of nursing.

When questioned if the form favored the identification of nursing diagnoses, there was 100% of affirmative answers.

Regarding the suggestions, the following answers were obtained: reduction of the number of pages, inclusion of the nursing prescription and increase of the number of lines in the evolution of nursing. It was not possible to respect the first and second suggestions on account of the diversity of existent information in the instrument and because of not being a purpose of the study.

DISCUSSION

The data of this study revealed the necessity of the inclusion of information on the evaluation of the psychospiritual and psychosocial necessities. The psychospiritual necessity is defined as a way of overcoming the anguish and acquisition of mechanisms to resist physical and emotional suffering, as well as to reduce anxiety. The psychospiritual necessity refers to the necessities of security and protection, creativity, learning, love, freedom, communication, leisure, social relations, friendship, attention and acceptance by a patient regarding the moment that he is living in.

The suggestions related to the addition in the instrument of collection of data with more information on the urinary and digestive system, skeletal muscle system, nutritional state, sensor and GCS data were respected, having in mind that they can support the identification of more problems and nursing diagnoses in the victims of TBI. It is pointed out also that the GCS is a practical and easy instrument that allows evaluate of the gravity of patients through the ocular opening, the best verbal response and the best motor response, its insertion in the data collection instrument being thus of basic importance.

The suggestion of inclusion of socio-demographic data in this inquiry allowed characterization of the victims of skull trauma, with the presentation of relevant data, including: age, gender and the social condition of these victims, as well as to make available for health managers data on the gravity of the trauma, making possible the delineation of preventive actions regarding the traumatic injury.

The proposal of the judges regarding the substitution of signs and symptoms for basic human needs made possible the identification of the real necessities presented by the victims, such as the consolidation of the evaluation form on the basis of a theory.

Another suggestion of the judges went to the inclusion of data related to the intracranial high blood pressure (IHP), which was respected. The IHP reflects the relation between the content of the cranial cap and the volume of the skull, which can be considered constant; however IHP appears when an alteration of the volume of one of these contents takes place. It is emphasized that IHP causes secondary damage to the brain and its control is necessary for the maintenance of encephalic perfusion, which in most of the victims of TBI is compromised.

The creation and validation of a data collection instrument for victims of TBI makes support possible for the nurses to carry out the nursing record, as well as the identification of the basic human needs affected in these patients, besides nursing intervention in a systematic and individualized form, in a practical way and with optimization of the time.

It is emphasized that the use of protocols is an important tool for the nurse, since they prioritize and organize the actions of nursing to the patient victim of serious trauma, who requires constant evaluation and intensive care.

After the last evaluation of the instrument, most of the suggestions of the judges were respected, with adaptation, addition or abolition of items, so that complete agreement was reached.

When the process of validation was ended, a pilot test was performed using five victims of TBI who were interned in the ICU, in which the adaptation of the data collection instrument was verified, since it made possible the identification of 25 nursing diagnoses in victims of TCE.

In this way, the instrument was considered validated as to appearance and content for victims of TBI.
interred in the ICU of the HUSE.

CONCLUSION

The results of this study allowed building and validating a data collection instrument for victims of TBI, which was considered valid, since all the evaluated items reached a value superior to 75%, conformable to what is preferred in the literature.

One of the limitations of the study refers to the lack of some information identified in the last phase of validation of the instrument, in which stand out: parameters of the volumetric respirator, medications in use for the victims of TBI and pathological records which might support the identification of a greater quantity of nursing diagnoses.

However, it is believed that this instrument contributed in a significant way to the realization of the history and the identification of the diagnoses of nursing in victims of TBI. It is hoped that this instrument gives impulse to the implementation of other stages of the Systematization of Nursing Care in the ICU of the investigated hospital.

REFERENCES


Available from: http://www.springerpub.com/product/9780826126351


The development and validation of instrument...
The development and validation of instrument...
NECESSITIES OF OXYGENATION/BREATHING continued

THORAX:
- Palpation: Symmetric
  - Fromitus diminution
  - Fromitus increased
  - Dullness
  - Croppitation
  - Rib fractures
- Percussion: Hyper-resonance
- Auscultation: Vesicular Murmur (VM)
  - Nodules
  - Rales
  - Wheezing

NECESSITIES OF CIRCULATION

PULSE
- Normofigmia
- Bradycardia
- Bradysphygmic
- Hypertensive

PRESSURE LEVELS
- Average Arterial Pressure
- Central Venous Pressure
- Edema
- Phlebitis

VENOUS NETWORK
- Visible venous
- Network bleeding, specify place
- Capillary filling:
  - > 2 seconds
  - < 2 seconds
- Edema
- Phlebitis
- Edema
- Phlebitis

VENOUS ACCESS
- Peripheral
- Central

HEART AUSCULTATION
- Sounds
  - Normophonetic
  - Hyperphonetic
  - Tachycardiac
  - Gallop rhythm
  - Extra-systolic
  - Palpitations

NECESSITY OF THERMOREGULATION

TEMPERATURE
- Hot
- Cold
- Fever
- Afebrile

SKIN:
- Hyperthermia
- Hypothermia
- Hyperemia
- Hypoemia

NECESSITY OF HYGIENE

CORPORAL:
- Satisfactory
- Unsatisfactory
- Regular

SCALP:
- Satisfactory
- Unsatisfactory
- Regular

SKIN AND ATTACHED:
- Fissures
- Lesions
- Saburra
- Ulcers
- Hialtor

NECESSITY OF TISSUE INTEGRITY

SKIN:
- Hydrated
- Dehydrated
- Preserved
- Reduced
- Surgical incision
- Abrasions
- Fissure

TUNGOR:
- Compatible with age
- Homatomas
- Erythema
- Papule
- Vesikania
The development and validation of instrument...
### NECESSITY OF SENSORIAL PERCEPTION

<table>
<thead>
<tr>
<th><strong>AUDITORY ACUITY</strong></th>
<th>Reduced to the right</th>
<th>Reduced to the left</th>
</tr>
</thead>
<tbody>
<tr>
<td>Otalgia</td>
<td>To the right</td>
<td>To the left</td>
</tr>
<tr>
<td>Liquorrea</td>
<td>To the right</td>
<td>To the left</td>
</tr>
<tr>
<td>Periauricular echinosis</td>
<td>To the right</td>
<td>To the left</td>
</tr>
<tr>
<td>Tinnitus</td>
<td>Otorrhoe</td>
<td>Secretion</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>PRESENCE OF REFLECTIONS</strong></th>
<th>Corneal palpebral</th>
<th>Pupil</th>
<th>Babinski</th>
<th>Plantar</th>
</tr>
</thead>
</table>

### NECESSITY OF BODY MECHANICS

<table>
<thead>
<tr>
<th><strong>BONE/ARTICULAR</strong></th>
<th>Arthralgia</th>
<th>Muscle spasm</th>
<th>Cervicalgia</th>
<th>Muscle atrophy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lumbar ciatic pain</td>
<td>Lumbalgia</td>
<td>Cramps</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>MUSCLE STRENGTH</strong></th>
<th>Plegia:</th>
<th>To the right</th>
<th>To the left</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Paraisia:</td>
<td>To the right</td>
<td>To the left</td>
</tr>
<tr>
<td></td>
<td>Paresthesia:</td>
<td>To the right</td>
<td>To the left</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>MOVEMENTS IN BED</strong></th>
<th>Active</th>
<th>Passive</th>
</tr>
</thead>
</table>

### NECESSITIES OF NUTRITION/HIDRACION

<table>
<thead>
<tr>
<th><strong>NUTRITION:</strong></th>
<th>Type of diet:</th>
<th>Enteral</th>
<th>Gastric</th>
<th>Zero</th>
<th>Oral</th>
<th>NPT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Type of probe:</td>
<td>SNE</td>
<td>SNG</td>
<td>SOE</td>
<td>SOG</td>
<td>Gastronomy</td>
</tr>
<tr>
<td></td>
<td>Nutritional state:</td>
<td>Cachexia</td>
<td>Obesity</td>
<td>Water balance</td>
<td>Water Balance -</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nausea</td>
<td>Vomiting</td>
<td>Pyrosis</td>
<td>Oral</td>
<td>Serotherapy</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>HIDRACION</strong></th>
<th>Oral</th>
</tr>
</thead>
</table>

### NECESSITY OF ELIMINATION

<table>
<thead>
<tr>
<th><strong>ABDOMEN:</strong></th>
<th>Intestinal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inspection:</td>
<td>Plain</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Auscultation (air-fluid noises):</td>
<td>Present</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Percussion:</td>
<td>Dullness</td>
</tr>
<tr>
<td>Palpation:</td>
<td>Normotensive</td>
</tr>
</tbody>
</table>

**English/Portuguese**

J Nurs UFPE on line. 2012 May;6(5):1118-29

**DOI:** 10.5205/reuol.2450-19397-1-LE.0605201221

**ISSN:** 1981-8963
The development and validation of instrument...