● **Original article**

CULTURAL ADAPTATION OF THE CRITICAL NURSING SITUATION INDEX FOR THE BRAZILIAN CULTURE*

Anderson Neri Guido[1], Edinêis de Brito Guirardello[2]

ABSTRACT: Objective: to translate and adapt the Critical Nursing Situation Index for the Brazilian culture. **Method:** methodological study that used the stages of translation, synthesis of translations, back-translation, evaluation by committee of judges and pre-test with the participation of 30 nurses. Performed in the period from August 2016 to April 2017 in an Intensive Care Unit in the city of Campinas-SP. **Results:** the Brazilian version of the instrument was obtained. Assessment of semantic, idiomatic, cultural and conceptual equivalence by the committee resulted in a concordance rate ≥80%. Of the 84 items that comprise the instrument, four underwent modifications. The mean completion time of the instrument in the pre-test stage was 16.7 minutes (Standard deviation ±7.4). **Conclusion**: The methodological process of translation and cultural adaptation of the Critical Nursing Situation Index was completed successfully, and the instrument presented a satisfactory degree of global comprehension and applicability.
KEYWORDS: Intensive care; Patient safety; Nursing; Translation; Service indicators.

ADAPTAÇÃO CULTURAL DO *CRITICAL NURSING SITUATION INDEX* PARA A CULTURA BRASILEIRA

RESUMO: Objetivo: traduzir e adaptar o *Critical Nursing Situation Index* para a cultura brasileira. **Método:** estudo metodológico que empregou as etapas de tradução, síntese das traduções, retro tradução, avaliação por comitê de juízes e pré-teste com a participação de 30 enfermeiros. Realizado no período de agosto de 2016 a abril de 2017 numa Unidade de Terapia Intensiva na cidade de Campinas-SP. **Resultados:** obteve-se a versão brasileira do instrumento. Avaliação das equivalências semântica, idiomática, cultural e conceitual pelo comitê resultou em uma taxa de concordância ≥ 80%. Dos 84 itens que compõem o instrumento, quatro sofreram modificações. O tempo médio de preenchimento do instrumento na etapa de pré-teste foi de 16,7 minutos (Desvio-padrão ± 7,4). **Conclusão:** O processo metodológico de tradução e adaptação cultural do *Critical Nursing Situation Index* foi concluído com sucesso, e o instrumento apresentou grau satisfatório de compreensão global e aplicabilidade.
DESCRITORES: Cuidados críticos; Segurança do paciente; Enfermagem; Tradução; Indicadores de serviços.

EADAPTACIÓN CULTURAL DEL *CRITICAL NURSING SITUATION INDEX* A LA CULTURA BRASILEÑA

RESUMEN: Objetivo: Traducir y adaptar el *Critical Nursing Situation Index* a la cultura brasileña. **Método:** Estudio metodológico aplicando las etapas de traducción, síntesis de las traducciones, retrotraducción, evaluación por comité de expertos y prueba piloto, con participación de 30 enfermeros. Realizado en el período de agosto de 2016 a abril de 2017 en una Unidad de Terapia Intensiva en la ciudad de Campinas-SP. **Resultados**: Se obtuvo la versión brasileña del instrumento. La evaluación de equivalencias semántica, idiomática, cultural y conceptual por parte del comité arrojó una tasa de concordancia ≥ 80%. De los 84 ítems que integran el instrumento, 4 sufrieron modificaciones. El tiempo promedio de completado del instrumento en la etapa de prueba piloto fue de 16,7 minutos (Desvío Estándar ± 7,4). **Conclusión**: El proceso metodológico de traducción y adaptación cultural del *Critical Nursing Situation Index* concluyó con éxito, y el instrumento obtuvo grado satisfactorio de comprensión global y aplicabilidad.
DESCRIPTORES: Cuidados Críticos; Seguridad del Paciente; Enfermería; Traducción; Indicadores de Servicios.

*Manuscript derived from the dissertation entitled: Cultural Adaptation and Validation of the Critical Nursing Situation Index for the Brazilian Culture. State University of Campinas - UNICAMP, 2017.

[1]Nurse, MSc in Healthcare Sciences, Faculty of Nursing. Manager of the surgical center of the Dr. Mario Gatti Municipal Hospital. Campinas-SP-Brazil.
[2]Nurse, PhD in Nursing. Associate Professor, Faculty of Nursing, State University of Campinas. Campinas-SP-Brazil.

Corresponding Author:
Anderson Neri Guido
Universidade Estadual de Campinas, Faculdade de Enfermagem
R. Tessália Vieira de Camargo, 126. Cidade Universitária - Campinas, SP – Brazil – CEP – 13083887
E-mail: anderson_neri@hotmail.com

Received: 06/09/2017
Finalized: 08/02/2018

INTRODUCTION

Nursing plays an important role in promoting patient safety[1]. This responsibility intensifies in the Intensive Care Unit (ICU) environment as the professionals who work there need to pay attention to both the severity of the patient and the complexity and variety of the innumerable pieces of equipment inherent to this environment[2]. Due to these characteristics, intensive care services rely on a series of protocols that guide treatment and care activities[3]. The use of these resources favors the quality of care, reduces the length of hospitalization and, as a consequence, the service costs[4]. A protocol is understood as a clear structure or algorithmic approach to care that provides the members of the multiprofessional team with precise instructions to be followed, constituting individual actions or bundles as a way to organize the care or establish a clinical pathway[5].

The use of protocols can significantly reduce the care risks, as demonstrated by Pronovost (2006) and his colleagues, who, after establishing a bundle of five clinical evidence-based care actions, such as hand washing, maximum barrier precaution for central catheter insertion, skin cleansing with chlorhexidine solution, avoidance of the femoral site if possible and immediate removal of unnecessary catheters, recommended by the Center for Disease Control (CDC), reduced the incidence rate of bloodstream infection from 0.62 to 0.34 in 18 months[6].

A US study estimated that 82,000 bloodstream infections associated with the central catheter occur annually, with 31,665 deaths attributed to this type of adverse event. This situation generates an mean annual cost per case ranging from $ 11,971 to $ 56,000 for care for patients who develop this type of infection[7], therefore, using this bundle, in addition to providing better care, allows for savings of resources by avoiding such a harmful condition for the patient. Another study highlighted that errors related to healthcare may constitute the third largest cause of death in the United States[8]. Therefore, in order to guarantee safe patient care, it is necessary to measure the performance of the health team through valid and reliable methods capable of measuring the quality of the care provided[9].

During the performance of their daily activities, nursing professionals make constant visits to the patient's bedside, and because they occupy this privileged position in healthcare, these professionals have the capacity to identify and correct several situations considered critical in the nursing care[10]. These situations are defined as any observed event, which does not correspond to or is in disagreement with nursing protocols and standards considered to be good clinical practices, adopted in the context of the execution of intensive care activities[11].

The Critical Nursing Situation Index (CNSI) is an instrument that aims to measure critical nursing situations during adult patient care[11]. Developed for use in the adult ICU and later adapted for the pediatric ICU[12], this instrument is considered to be one of the pillars of the safety first initiative of the Erasmus MC - Sophia Children's Hospital, for providing evaluation and updating of intensive care protocols, in addition to judging the impact of adherence or non-adherence to these protocols on the incidence related to healthcare-associated adverse events[13].

The instrument is composed of 84 descriptions of critical nursing situations, divided into eight domains: basic nursing care in ICUs (14 items), mechanical ventilation (20 items), venous access (infusion and measures) (10 items), administration of fluids (5 items), cardiac rhythm and circulation (10 items), enteral nutrition (6 items), hygiene care and control of devices (11 items)[11]. The response options for each observed item are: true (presence of critical situation), false (absence of critical situation) or not applicable. The sum of the items classified as true reflects the number of critical situations, while the sum of the items identified as true and false determines the number of risk items. The instrument generates an index, which is the percentage of true items in relation to the risk items. The higher the index, the more protocol deviations were found and, consequently, the lower the quality of care provided[11].

With the aim of providing a tool capable of evaluating adherence to institutional protocols and instrumentalizing the intensive care nursing teams to perform such evaluations, the present study aimed to perform the translation and cultural adaptation of the Critical Nursing Situation Index (CNSI) for the Brazilian culture.

METHOD

This was a methodological study of the translation and cultural adaptation of the CNSI for the Brazilian reality. For the translation and cultural adaptation process, the steps of translation, synthesis of the translations, back translation, evaluation by committee of judges and pre-test were followed[14].

In the first stage of the process of cultural adaptation, the instrument was translated by two independent translators, both fluent in English, with Brazilian Portuguese as their first language. It should be noted that one of the translators did not receive information about the objectives and concepts related to the instrument. This step resulted in two versions (T1 and T2). Next, the synthesis of the versions was performed by the researchers, obtaining the synthesis-version (T12).

The back-translation was performed by two independent translators, with fluency in Brazilian Portuguese and English as their first language. They translated the synthesis-version back into English. The purpose of this procedure was to check the validity of the translation and to verify the existence of discrepancies in the meaning and content between the original instrument and the translated instrument[14].

The versions produced were submitted to evaluation by a committee of six judges, composed of a methodologist, a linguist, two nurses working in intensive care and two physiotherapists specialized in intensive care. The aim of this stage was to evaluate the semantic, idiomatic, conceptual and cultural equivalences between the original version and the synthesis-version, also obtaining the validation of the content of the instrument.

Semantic equivalence refers to the transfer of meanings between languages, taking into account grammar and vocabulary, in order to achieve a similar effect with subjects who use different languages. Language equivalence is an unfolding of semantic equivalence and considers the adaptations necessary to translate expressions that have no meaning in their literal sense, are colloquial, informal or slang expressions, which are often difficult or impossible to translate literally. The conceptual and cultural equivalences refer to exploring the main concepts and their definitions in the target populations[15].

The judges received a formal invitation with guidelines on the work to be performed, as well as a table containing all the versions produced in the previous stages. They were asked to quantitatively evaluate the 84 items of the instrument by judging the equivalences on a scale divided in four degrees of agreement (1 - item not equivalent, 2 - impossible to evaluate without revision of item, 3 - equivalent, but needs changes, 4 - absolutely equivalent). A degree of consensus ≥80%[16] was established for each item evaluated.

The items that did not at first achieve this rate of concordance were then discussed at a meeting with the judges, revised and modified, until consensus was reached. In addition, the judges evaluated the instrument qualitatively, thus defining its content validity. At the end of this stage, the pre-final version of the instrument was generated.

In the pre-test stage, 30 nurses from the ICU of a university hospital of the state of São Paulo received specific instructions for the application of the pre-final version of the instrument. They were asked to evaluate the completion time and the applicability of the instrument. In addition, they were asked to express their opinions on items that needed revision.

This study obtained authorization from the author of the instrument to carry out the translation and cultural adaptation procedure, as well as the approval of the research ethics committee of the State University of Campinas (UNICAMP), with authorization No. 1.693.664.

● RESULTS

The initial stages of translation, synthesis and back-translation were carried out without difficulties, with only four items that obtained a percentage of concordance below 80%. Items 17 and 63 presented 50% concordance in all the equivalences evaluated, while item 4 presented concordance of 67% in the semantic-idiomatic equivalences; and the title of the eighth domain (T8) achieved 67% concordance in the cultural equivalence category (Figure 1).

Figure 1-Modification of the CNSI items after the face-to-face meeting of the judges. Campinas, SP, Brazil, 2017

items	Critical Nursing Situation Index	Synthesis-version	Final version
4	Entrance of the isolation room is not marked as such	The precaution room does not have signaling according to protocol of the institution	The precaution room (isolation) is not identified as such
17	No manual inflation according to protocol	Without respiratory physiotherapy according to protocol	Absence of manual insufflation (maneuver with AMBU®) according to protocol
63	No supported continuous flush infusion in patient with cardiogenic medication	No continuous infusion for supported lavage in patients with cardiogenic medication	Absence of continuous infusion for supported lavage in patients receiving vasoactive drug(s)
T8	Hygienic care and control of parts and devices items	Hygiene care and control of parts and devices	Hygiene care and control of devices

The items presented in Table 1 were modified after a face-to-face meeting with the members of the judges and researchers committee, allowing them to evaluate the items qualitatively.

Regarding item 4, the questions raised were regarding the words precaution and isolation, since both words have different meanings in Brazil. It was then suggested to add the word "isolation" in parentheses to facilitate the comprehension of the item. Item 17 presented similar difficulty, since in Brazil it is very common to use the AMBU® trademark to describe the bag device - unidirectional valve - mask used to perform procedures that require manual inflation. Thus, the explanatory parenthesis was chosen, maintaining the trademark of this type of equipment. Item 63 presented difficulties as it is an uncommon practice in Brazil, with it being necessary to consult the author of the original version of the instrument in order to obtain more information about this protocol, to obtain the pre-final version of the translation and cultural adaptation process. Finally, the judges observed that the use of the word 'parts' in the title of the eighth domain did not correspond to the common usage in Brazilian culture, choosing to remove this word from the translation. After these adjustments, the revised items achieved 100% consensus, and the modifications were incorporated into the pre-final version of the instrument, which was submitted to the pre-test.

During the pre-test, some nurses reported difficulty in recognizing that the evaluation of the items that make up the mechanical ventilation domain was within their competence. The mean completion time of the instrument was 16.7 minutes (*sd*±7.4), with minimum completion time of 5 and maximum of 35 minutes.

The comprehension of the instructions for applying the instrument and the ease of understanding and marking its items are shown in Table 1, and the items that make up the version of the instrument are presented in Figure 2.

Table 1 - Results of the evaluation of applicability of the instrument in the pre-test stage. Campinas, SP, Brazil, 2017

Questions	Completely Disagree		Partially Disagree		I do not have an opinion		Partially Agree		Completely Agree	
	n	%	n	%	n	%	n	%	n	%
I found it easy to understand the instructions of the instrument	0	0	4	13.3	1	3.4	12	40	13	43.4
I found it easy to understand the items of the instrument	0	0	2	6.7	0	0	21	70	7	23.3
I found it easy to mark the items of the instrument	0	0	4	13.3	1	3.3	8	26.7	17	56.7

Figure 2 - Critical Nursing Situation Index (Brazilian version). Campinas, SP, Brazil, 2017. (continues)

Cuidados Básicos de Enfermagem em UTI	
1	Ausência de histórico/registro de culturas bacterianas após transferência de outro hospital
2	Cultura bacteriana atrasada por mais de 2 horas (apesar de pedido por escrito)
3	Ausência de avaliação de risco para úlceras por pressão
4	O quarto em precaução (isolamento) não está identificado como tal
5	Os olhos do paciente estão visivelmente contaminados
6	Uso incorreto da Escala de Coma de Glasgow
7	O paciente não é mobilizado de acordo com as instruções
8	A posição do paciente não está de acordo com as instruções
9	Ausência de evacuação por mais de 3 dias e sem nenhuma intervenção no 4º dia
10	Ausência de controle do débito urinário para avaliação do balanço hídrico
11	Ausência de registro do turno anterior
12	Ausência de registro sobre família ou parentes
13	Ausência de registro sobre a altura e peso do paciente nos formulários da UTI
14	Ausência de registro atualizado de temperatura (últimas 48 horas)
Ventilação Mecânica	
15	Discrepância entre o registro e o ajuste real dos parâmetros de ventilação mecânica
16	Ausência de registro da PEEP intrínseca, de hora em hora, durante ventilação de pressão controlada
17	Ausência de insuflação manual (manobra com AMBU®) de acordo com o protocolo
18	Ausência de aspiração endotraqueal de acordo com o protocolo
19	Ausência de registro claro de mudanças nos parâmetros de ventilação mecânica
20	Reposicionamento do tubo endotraqueal em desacordo com o protocolo
21	Ausência de amostra de gasometria arterial em até 1hora após remoção do tubo endotraqueal
22	Terapia de inalação durante ventilação mecânica não está de acordo com as instruções
23	Cabeceira do leito do paciente não está de acordo com o protocolo
24	Condensado visível (água ou secreção) entre a conexão do circuito respiratório e o tubo endotraqueal
25	Condensado acumulado (água ou secreção) no circuito respiratório
26	Condensado visível (água ou secreção) no circuito inspiratório da ventilação mecânica
27	O sistema de umidificação não funciona (está desligado)
28	Ausência de monitorização da saturação de oxi-hemoglobina periférica (oximetria de pulso) e capnografia do paciente em posição prona
29	Ausência de sistema fechado de aspiração endotraqueal em pacientes na posição prona
30	Ausência de umidificador conectado ao fluxômetro de oxigênio na configuração básica do painel da UTI (suporte no caso de mau funcionamento do ventilador)

31	Ausência de sistema de aspiração endotraqueal completo (e funcionando) na configuração básica do painel da UTI
32	Ausência de solução estéril de NaCL 0,9% para *flush* endotraqueal na configuração básica do painel da UTI
33	Ajuste de fluxo incorreto durante a ventilação mecânica no modo assistido
34	O ajuste máximo de pressão da ventilação mecânica excede os limites prescritos (seguros)
Acessos Endovenosos (infusão e medidas)	
35	Ausência de registro da inserção do cateter venoso central
36	Ausência de registro da inserção do cateter arterial
37	Cateter de Swan-Ganz *in situ* por mais de 4 dias
38	Cateter central *in situ* em desacordo com o protocolo (tempo de permanência ou condição)
39	Cateter arterial *in situ* em desacordo com o protocolo (tempo de permanência ou condição)
40	Uma ou mais tampas faltando no acesso arterial
41	Uma ou mais tampas faltando no cateter de Swan-Ganz
42	Uma ou mais tampas faltando no acesso venoso periférico
43	Bolsa de soro vazia no sistema de bolsa pressórica
44	Pressão insuficiente no sistema de bolsa pressórica
Administração de Fluidos	
45	Ausência de avaliação de balanço hídrico de acordo com o protocolo
46	Bolsa de sangue sem número de registro está instalada no paciente
47	Bolsa de sangue não foi conferida e checada por um segundo profissional de enfermagem
48	Volume de fluidos utilizado para lavagem (*flush*) não foi mensurado (ou está incorreto) no formulário de balanço hídrico da UTI
49	Nem todas as infusões administradas no paciente estão registradas no formulário da UTI
Ritmo Cardíaco e Circulação	
50	Ausência do ECG de rotina feito na admissão
51	Pressão arterial invasiva não conferida com esfigmomanômetro de acordo com o protocolo
52	Ausência de estudo hemodinâmico realizado em pacientes com cateter de Swan-Ganz
53	Monitoramento incorreto do ritmo cardíaco (frequência)
54	Alarme sonoro do ritmo cardíaco está permanentemente desligado
55	Alarme sonoro para curvas de pressão está permanentemente desligado
56	Limites de alarme do ritmo cardíaco e pressão arterial não estão ajustados adequadamente
57	Ponto de referência e dispositivo de pressão invasiva não está nivelado na altura correta
Medicação	
58	Medicações prescritas não foram administradas ou não estão checadas
59	Medicação endovenosa prescrita para infusão prolongada não conectada
60	Discrepância entre a taxa de infusão de medicação endovenosa prescrita e real
61	Medicação endovenosa de infusão prolongada conectada ao paciente não está anotada no formulário da UTI
62	Medicação endovenosa preparada sem dupla verificação e checagem de acordo com o protocolo
63	Ausência de infusão contínua para lavagem de suporte em pacientes recebendo droga(s) vasoativa(s)
64	Via de acesso não utilizada não está tampada
65	Medicação endovenosa conectada no lúmen errado
66	Medicação endovenosa de via exclusiva combinada com outra medicação
67	Medicação endovenosa contínua combinada com medicação endovenosa intermitente
Nutrição Enteral	
68	Ausência de registro de introdução do cateter enteral
69	Ausência de mensuração do resíduo gástrico durante terapia de nutrição enteral
70	Ingestão de menos de 75% da alimentação enteral prescrita sem razão específica
71	Cateter enteral pós-pilórico não lavado de acordo com as instruções

72	Troca do frasco de dieta enteral excede o tempo permitido
73	Paciente com cabeceira do leito horizontal enquanto recebe dieta enteral
Cuidados de Higiene e Controle de Dispositivos	
74	Dispositivo de dreno de tórax em aspiração vazando ar
75	Selo d'água do dispositivo de dreno de tórax ausente ou insuficiente
76	Dispositivos de inalação não trocados de acordo com o protocolo
77	Sistema fechado de aspiração traqueal não trocado de acordo com o protocolo
78	Equipamento de ventilação mecânica não trocado de acordo com o protocolo
79	Sistema de infusão de nutrição parenteral não trocado de acordo com o protocolo
80	Curativo do cateter venoso central não trocado de acordo com o protocolo
81	Curativo do cateter arterial não trocado de acordo com o protocolo
82	Sistema de mensuração de pressão venosa central (PVC) ou pressão arterial invasiva não trocados de acordo com o protocolo
83	Equipo de soro não trocado de acordo com o protocolo
84	Curativo de inserção de cateteres periféricos não trocados de acordo com o protocolo

● DISCUSSION

Measuring instruments developed in other languages and other cultures cannot simply be translated due to important cultural and linguistic differences. Therefore, the process of translation and cultural adaptation requires following the recommended steps of the model adopted[14], considering the linguistic, semantic, cultural and conceptual aspects[15].

In this study, the stages of translation, synthesis, back-translation, evaluation by committee of judges and pre-test were carried out satisfactorily. During the face-to-face meeting, the multidisciplinary composition of the committee of judges allowed for a rich discussion of the items and their translation. The evaluation of equivalences was carried out both quantitatively, when establishing the concordance, and qualitative, since all the judges gave their opinions on the translation of the items of the instrument, providing valuable suggestions for the composition of the pre-final version.

Only item 63, "Absence of continuous infusion for supported lavage in patients receiving vasoactive drug(s)", had to be approached with the corresponding author of the original instrument, as well as demanding more discussion during the face-to-face meeting with the judges. This item refers to a technique mainly used with syringe infusion pump systems, coupled to a volumetric infusion pump, which contains saline solution that acts as a vehicle for the highly concentrated vasoactive medications contained in the syringes. However, this practice is not common in the Brazilian culture, and this item led to several notes, by the nurses participating in the pre-test, regarding the meaning of this practice.

It is important to note that the CNSI can and should be modified according to the reality of the institution where it will be applied. Such adaptations are necessary, since institutional protocols have particularities and vary between institutions of the same country. These adjustments do not compromise the validity of the tool and are recommended by the author of the instrument, since the principle of the CNSI is based on the measurement of observable and avoidable deviations or errors in nursing care, not an unchanging list of items that should be rigorously copied for use in other healthcare institutions[16].

Regarding the applicability of the instrument, the majority of the nurses agreed partially or completely that it was easy to understand the instructions and respond to the items of the instrument. The mean time of 16.7 minutes for completion of the instrument can be explained by the fact that the nurses completed the instrument while performing their activities during working hours and therefore had to deal with the usual interruptions and demands that arose during the shift.

Regarding the "mechanical ventilation" domain, it was highlighted by some nurses that this assessments should be performed by the physiotherapy team, as many stated "not knowing" or "not mastering" the information or parameter settings used in the mechanical ventilator. This particularity can be explained

by the fact that the complex ICU environment needs quality continuing education for the nursing team, including the use of equipment such as the ventilator[17]. A study carried out in Brazil highlighted that the main difficulties reported by the nursing team when providing care to critical patients on mechanical ventilation were lack of knowledge about the care, lack of safety in handling the ventilator and lack of further training courses[18].

It should be noted that the CNSI, in addition to filling the gap of instruments that allow the nurse to quantify the adherence or not of the team to the institutional protocols in the Brazilian culture, favors the provision of safe patient care. The need for additional tests to evaluate the psychometric properties, through the use of other reliable and valid measures of evaluation, should be emphasized, considering that the present work only assured the validity of the content of the tool.

● CONCLUSION

This study performed the cultural adaptation of the CNSI for the Brazilian culture in a satisfactory way. It is a tool capable of assessing and quantifying the adherence of the intensive care nursing team to the institutional protocols, in order to identify failures that may jeopardize the safety of the patients attended in these units.

The process of cultural adaptation followed the methodological framework recommended by the literature, achieving the proposed goal of elaborating the Brazilian version of the instrument. The need for additional tests to evaluate the psychometric properties, through the use of other reliable and valid measures of evaluation, should be emphasized, considering that the present work only assured the validity of the content of the instrument.

● REFERENCES

1. Te Beest H, van der Starre C, Tibboel D, van Dijk M. Nursing protocol violations: detect, correct and communicate. Nurs Crit Care. [Internet] 2013;18(2) [accessed on 13 Aug 2015]. Available at: http://dx.doi.org/10.1111/j.1478-5153.2012.00533.x.

2. Zeraati M, Alavi NM. Designing and validity evaluation of Quality of Nursing Care Scale in Intensive Care Units. J Nurs Meas. [Internet] 2014;22(3) [accessed on 13 Aug 2015]. Available at: https://doi.org/10.1891/1061-3749.22.3.461.

3. de Vos M, Graafmans W, Keesman E, Westert G, van der Voort PHJ. Quality measurement at intensive care units: which indicators should we use? J Crit Care. [Internet] 2007;22(4) [accessed on 13 Aug 2015]. Available at: http://dx.doi.org/10.1016/j.jcrc.2007.01.002.

4. Hammond JJ. Protocols and guidelines in critical care: development and implementation. Curr Opin Crit Care. [Internet] 2001;7(6) [accessed on 13 Aug 2015]. Available at: https://doi.org/10.1097/00075198-200112000-00017.

5. LeBlanc JM, Kane-Gill SL, Pohlman AS, Herr DL. Multiprofessional survey of protocol use in the intensive care unit. J Crit Care. [Internet] 2012;27(6) [accessed on 13 Aug 2015]. Available at: https://doi.org/10.1016/j.jcrc.2012.07.012.

6. Pronovost P, Needham D, Berenholtz S, Sinopoli D, Chu H, Cosgrove S, et al. An intervention to decrease catheter-related bloodstream infections in the ICU. N Engl J Med. [Internet] 2006;355(26) [accessed on 13 Aug 2015]. Available at: https://doi.org/10.1056/NEJMoa061115.

7. Pronovost PJ, Watson SR, Goeschel CA, Hyzy RC, Berenholtz SM. Sustaining Reductions in Central Line-Associated Bloodstream Infections in Michigan Intensive Care Units A 10-Year Analysis. Am J Med Qual. [Internet] 2015;31(3) [accessed on 13 Aug 2015]. Available at: http://doi.org/10.1177/1062860614568647.

8. Makary MA, Daniel M. Medical error-the third leading cause of death in the US. BMJ. [Internet] 2016;353 [accessed on 19 Oct 2017]. Available at: https://doi.org/10.1136/bmj.i2139.

9. Pronovost PJ, Berenholtz SM, Ngo K, McDowell M, Holzmueller C, Haraden C, et al. Developing and pilot testing quality indicators in the intensive care unit. J Crit Care. [Internet] 2003;18(3) [accessed on 13 Aug 2015]. Available at: https://doi.org/10.1016/j.jcrc.2003.08.003.

10. Wassenaar A, Boogaard M, Hooft T, Pickkers P, Schoonhoven L. 'Providing good and comfortable care by building a bond of trust': nurses views regarding their role in patients' perception of safety in the Intensive Care Unit. J Clin Nurs. [Internet] 2015;24(21-22) [accessed on 13 Aug 2015]. Available at: https://doi.org/10.1111/jocn.12995.

11. Binnekade JM, de Mol BA, Kesecioglu J, de Haan RJ. The Critical Nursing Situation Index for safety assessment in intensive care. Intensive Care Med. [Internet] 2001;27(6) [accessed on 13 Aug 2015] Available at: https://doi.org/10.1007/s001340100947.

12. de Neef M, Bos AP, Tol D. Safety as a criterion for quality: The Critical Nursing Situation Index in paediatric critical care, an observational study. Intensive Crit Care Nurs. [Internet] 2009;25(6) [accessed on 13 Aug 2015]. Available at: https://doi.org/10.1016/j.iccn.2009.08.002.

13. Van der Starre C, Van der Tuijn Y, Tibboel D. Patient safety management system in pediatric ICUs. Springer. [Internet] 2006 [accessed on 13 Aug 2015] Available at: https://doi.org/10.1007/3-540-33396-7_70.

14. Beaton D, Bombardier C, Guillemin F, Ferraz MB. Recommendations for the cross-cultural adaptation of the DASH & QuickDASH outcome measures. Institute for Work & Health. [Internet] 2007;1(1) [accessed on 13 Aug 2015] Available at: http://www.dash.iwh.on.ca/sites/dash/files/downloads/cross_cultural_adaptation_2007.pdf

15. Epstein J, Santo RM, Guillemin F. A review of guidelines for cross-cultural adaptation of questionnaires could not bring out a consensus. J Clin Epidemio. [Internet] 2015;68(4) [accessed on 20 Aug 2016] Available at: https://doi.org/10.1016/j.jclinepi.2014.11.021.

16. Binnekade JM, Vroom MB, de Mol BA, De Haan RJ. The quality of intensive care nursing before, during, and after the introduction of nurses without ICU-training. Heart Lung. [Internet] 2003;32(3) [accessed on 13 Aug 2015]. Available at: https://doi.org/10.1016/S0147-9563(03)00032-3.

17. Guilhermino MC, Care GCC, Inder KJ, Epid GDC, Sundin D, Kuzmiuk L, et al. Nurses' perceptions of education on invasive mechanical ventilation. J Contin Educ Nurs. [Internet] 2014;45(5) [accessed on 20 Jun 2016]. Available at: https://doi.org/10.3928/00220124-20140417-01.

18. Melo EM, Teixeira CS, Oliveira RT, Almeida DT, Veras Jeglf FNM. Cuidados de enfermagem ao utente sob ventilação mecânica internado em unidade de terapia intensiva. Rev Enf Ref. [Internet] 2014;4(1) [accessed on 13 Aug 2015]. Available at: http://www.scielo.mec.pt/scielo.php?script=sci_abstract&pid=S0874-02832014000100007&lng=pt&nrm=i http://dx.doi.org/10.12707/RIII1316.