

VALIDATION OF CONTENT OF AN INSTRUMENT FOR THE EVALUATION OF TRAINING IN CARDIOPULMONARY RESUSCITATION

VALIDAÇÃO DE CONTEÚDO DE UM INSTRUMENTO PARA AVALIAÇÃO DA CAPACITAÇÃO EM RESSUSCITAÇÃO CARDIOPULMONAR

VALIDACIÓN DE CONTENIDO DE UN INSTRUMENTO PARA EVALUACIÓN DE LA CAPACITACIÓN EN RESUSCITACIÓN CARDIOPULMONAR

Marina Germani Lucas ¹
Gabriela Vicher Nalin ¹
Ana Lúcia Gargione Galvão Sant'Anna ¹
Suelen Alves de Oliveira ¹
Regimar Carla Machado ¹

¹ Universidade Federal de São Carlos-UFSCar, Departamento de Enfermagem. São Carlos, SP – Brazil.

Corresponding author: Regimar Carla Machado. E-mail: regimarmachado@gmail.com
Submitted on: 2017/08/28 Approved on: 2018/08/01

ABSTRACT

The aim of this study was to validate the content of an instrument for the evaluation of training in cardiopulmonary resuscitation for health professionals. This is a validation of the content and appearance of a data collection instrument, consisting of the steps of assessment and preparation of the final version of the instrument. Five evaluators / judges participated and the representativeness of the items in relation to the content was measured using the Content Validity Index (CVI), calculated by the number of evaluators according to the item by the total number of evaluators. The adjustments of the instrument of data collection were carried out in agreement with the contributions coming from the evaluators and analysis of the scientific literature. The instrument, based on international guidelines for cardiopulmonary resuscitation, in its final version, after the content and appearance validation process, presents eighteen items aimed at assessing the impact and quality of training of health professionals in the care of the victims at standstill Cardiopulmonary resuscitation.

Keywords: Nursing; Validation Studies; Health Education; Cardiopulmonary Resuscitation.

RESUMO

O objetivo deste estudo foi realizar a validação de conteúdo de um instrumento para avaliação da capacitação em ressuscitação cardiopulmonar para profissionais da saúde. Trata-se de uma validação de conteúdo e aparência de um instrumento de coleta de dados, constituído pelas etapas de ajuizamento e elaboração da versão final do instrumento. Participaram cinco avaliadores/juízes e a representatividade dos itens em relação ao conteúdo abordado foi mensurada por meio do índice de validade de conteúdo (IVC), calculado pelo número de avaliadores concordante com o item pelo número total de avaliadores. Foram realizadas as readequações do instrumento de coleta de dados em concordância com as contribuições advindas dos avaliadores e análise da literatura científica. O instrumento elaborado com base nas diretrizes internacionais de ressuscitação cardiopulmonar, em sua versão final, após o processo de validação de conteúdo e aparência, apresenta 18 itens voltados para a avaliação do impacto e da qualidade das capacitações de profissionais da saúde no atendimento à vítima em parada cardiorrespiratória.

Palavras-chave: Enfermagem; Estudos de Validação; Educação em Saúde; Reanimação Cardiopulmonar.

RESUMEN

El objetivo de este estudio fue realizar la validación de contenido de un instrumento para evaluación de la capacitación en resucitación cardiopulmonar para profesionales de la salud. Se trata de la validación de contenido y apariencia de un instrumento de recogida de datos, constituido por las etapas de evaluación y elaboración de la versión final del instrumento. Participaron cinco evaluadores / árbitros y se midió la representatividad de los ítems en relación al contenido enfocado por el Índice de Validez de Contenido (IVC), calculado por el número de evaluadores concordante con el ítem por el número total de evaluadores. Se realizaron las correcciones del instrumento de recogida de datos en concordancia con las contribuciones provenientes de los evaluadores y análisis de la literatura científica. El instrumento, elaborado en base a las instrucciones internacionales de resucitación cardiopulmonar, en su versión final, después del proceso de validación de contenido y apariencia, presenta dieciocho ítems para evaluación del impacto y calidad de capacitación de profesionales de la salud en la atención a víctimas con parada cardiorrespiratoria.

Palabras clave: Enfermería; Estudios de Validación; Educación en Salud; Reanimación Cardiopulmonar.

How to cite this article:

Lucas MG, Nalin GV, Sant'Anna ALGG, Oliveira SA, Machado RC. Validation of content of an instrument for evaluation of training in cardiopulmonary resuscitation. REME – Rev Min Enferm. 2018[cited _____];22:e-1132. Available from: _____ DOI: 10.5935/1415-2762.20180061

INTRODUCTION

Cardiorespiratory arrest (CRA) is characterized by the sudden cessation of cardiac activity, with absence of palpable pulse and respiratory movements.¹ The American Heart Association (AHA) and the European Resuscitation Guideline bring the best recommendations for care to individuals in situations of cardiovascular emergencies, considering their efficacy, applicability and ease of integration with education.²⁻⁵ In addition, the standardization of CPR maneuvers provides health team autonomy and automation of the process to provide fast, effective and error-free assistance.²⁻⁵

It is assumed that periodic training with the health team contributes to adequate assistance in situations of higher emergency and critical care. However, health research needs to be based on scientific evidence to achieve interaction between knowledge and discernment in the best clinical decision making.⁶

Thus, it is important to emphasize that evaluation instruments of teaching strategies used in basic and advanced life skills training are fundamental to the appropriateness of the chosen approach.⁷ Above all, a data collection instrument, pre- and post-test type, deserves to be highlighted by the ease of use and effectiveness of analysis.⁵ This fact justifies its use as a guide for professional training in CPR, in which the effectiveness of the strategy used is reflected in the quality of professional training.^{2,6}

The theoretical content that structures this instrument should be based on the best scientific evidence, based on the guidelines of the AHA² and the European Resuscitation Guideline³⁻⁵, being re-adapted after validation of its content by specialists, so that the mixture of visions, cultures and scientific knowledge makes it appropriate to the proposed objectives.⁸

In general, the validity of a data collection instrument correlates with its accuracy in measuring the studied variable.⁹ There are several validation techniques, depending on relevance, completeness and accuracy, such as the validity of appearance and content, criterion and construct validity.¹⁰

The validation of appearance is a simple analysis, which infers if the apparent measure measures what is intended, being subjective and performed by a group of experts.¹¹ In the validation of content, one has the judgment of the instrument, as to the degree of specific domain of the content that one intends to measure.^{9,11,12} In the validation of criterion, the validity of the instrument is established, comparing it to some external criterion.⁹ On the other hand, construct validation is based on the ability of a test to measure a theoretical trait or construct, validating a body of theory underlying the testing of hypothetical relationships.^{13,14}

In this perspective, it is believed that the validation of a practical and systematized data collection tool based on international guidelines and the analysis of agreement between evaluators contributes to the effectiveness of basic and advanced life support training for the nursing team. Therefore,

the objective of the study was to validate the content of an instrument to evaluate training in cardiopulmonary resuscitation for health professionals.

METHOD

This is a methodological study aimed at evaluating the content and appearance of a data collection instrument for the evaluation of CPR training. The methodological trajectory of the study followed three stages: construction of the instrument; validation of the instrument by filing with experts; and agreement between *experts*/judges and the scientific literature.

The construction phase of the instrument occurred between May and July 2016, based on the AHA 2015 guidelines² and in the European Resuscitation *Guideline*³⁻⁵, consisting of two parts. The first one focused on the sociodemographic characterization of the subjects and the second one, with questions of multiple choices, referring to advanced life support: PCR recognition; requesting assistance by operating the emergency medical service (EMS); positioning of the victim and the rescuer; sequence of CPR maneuvers; carotid pulse evaluation; compression/ventilation ratio; use of the AED; administration of medications and post-CPR care.

The validation of the instrument to refine it in terms of scope, pertinence and clarity consisted of a filing bank with *experts* in the subject and that we fulfill inclusion criteria: be a nurse or doctor, specialist in cardiology and/or emergency and/or intensive therapy, with at least two years of experience in the subject. As for the exclusion criterion, it consisted in not respecting the period of 30 days of return of the completed data collection instrument. This step was held from March to May 2017.

The filing bank consists of the set of thoughts of professionals based scientifically to build or evaluate a context or practical situation.^{15,16}

According to the literature, there is no quantitative consensus of evaluators needed to validate an instrument.¹⁵ Thus, using snowball sampling, which consists of the strategy in which the initial participants indicate other subjects that meet the inclusion criteria of the study¹⁶, the sample universe was dependent on the intentionality of the participants who had the defining characteristics previously determined and possible to contact.

Twenty-one professionals were contacted by electronic mail, e-mail, through a formal invitation, informing the objectives and purpose of the study, however, five professionals participated in the research. The study was carried out from February to July 2017.

The evaluation of the instrument was performed using the Likert scale, with categories in four levels of importance and selection of a single response for each analyzed variable: completely adequate (4); adequate (3); partially adequate (2);

inadequate (1). This scale facilitates the evaluation of the instrument, as it provides a numerical score with different degrees of agreement regarding the affirmation and reaction of the subject, and its use is consolidated in the literature.^{15,16}

For the statistical treatment in this phase, the following categories were considered: completely adequate (CA) and adequate (A) excellent that obtained consensus $\geq 75\%$, being this index of agreement based on other validation studies.^{17,18} Also in this step, a space for suggestions and considerations was made available, in an observation column, for each item of the instrument.

The analysis of the second stage led to a reformulation and refinement of the content of the initial instrument. The data obtained was compiled into *Microsoft Excel* and statistical analysis was performed using the Epi-info7 program and SPSS 20.0 (SPSSInc, Chicago, USA). The quantitative variables were presented as means \pm standard deviation and medians and the categorical variables were in absolute and relative frequencies (percentage). The agreement of the experts regarding the representativeness of the items in relation to the content was measured by means of the content validity index (CVI), calculated by the number of evaluators agreeing with the item by the total number of evaluators. Regarding the psychometric criteria, the answers "yes" and the calculation of the percentage of agreement with the value above 75% with difference between the evaluators ($p < 0.001$) were considered for the variables considered pertinent to the instrument.

The third stage of the validation process carried out between June and August 2017 consisted of readjustments of the data collection instrument in agreement with the contributions coming from the judges' evaluations and analysis of the scientific literature, and its final validated version, composed of 18 items related to the advanced life support (Table 1).

Table 1 - Evaluation instrument for training in cardiopulmonary resuscitation for nurses. São Carlos, SP, 2017

<p>1. Choose the alternative that includes the correct sequence of CPR using the AED:</p> <p>I- Evaluate level of consciousness II-Ask for help, request the defibrillator III-Open airway and apply two rescue breaths IV- Evaluate carotid pulse V- Perform 30 chest compressions</p> <p>a) V, II, I, III, IV b) I, II, III, V, IV c) I, II, IV, V, III d) II, IV, I, III, V e) I do not know how</p>
<p>2. Check the appropriate alternative to the identification of the cardiorespiratory arrest:</p> <p>a) Patient does not respond to verbal requests and presents tachycardia b) Absence of breath and pulse c) Bradypnea and arterial hypotension d) Severe dyspnea e) I do not know how the answer</p>

Continue...

... continued

<p>3. Which alternative justifies the choice of carotid artery pulse check by the health professional in an adult patient?</p> <p>a) Because it is longer b) By allowing the evaluation of cerebral perfusion c) Because it is the last one to disappear in the CPR and the first to be reestablished in a reversal situation d) Because it is easier to palpate e) I do not know how the answer</p>
<p>4. Check the alternative that presents the best option regarding adequate surface and positioning of the victim to perform the CPR maneuvers:</p> <p>a) A rigid flat surface inclined in horizontal dorsal decubitus b) A flat non-rigid vertical surface in the horizontal dorsal decubitus position c) A rigid vertical flat surface in horizontal dorsal decubitus position d) A flat non-rigid surface in the horizontal dorsal decubitus position e) I do not know how the answer</p>
<p>5. What are the hand positions and depth of chest compressions during CRA care, according to the American Heart Association (AHA) 2015?</p> <p>a) In the left hemithorax near the heart and 1½ to 2 inches (approximately 4 to 5 cm) b) Approximately 2 cm above the sternal manubrium and 5 inches (approximately 5.5 to 8 cm) c) Lower half of the sternum and at least 2 inches (5 cm to 6 cm) d) None of the above e) I do not know how the answer</p>
<p>6. Indicate the alternative that shows how many compressions we should offer per minute during cardiorespiratory resuscitation:</p> <p>a) At least 100 compressions/minute b) From 100 to 120 compressions/minute c) 70 to 90 compressions/minute d) 60 compressions/minute e) 80 to 100 compressions/minute</p>
<p>7. What is the relationship between compression and ventilation in a patient without definite airway</p> <p>a) 30:2 with only two rescuers b) 15:2 with one or two rescuers c) 30:2 with one or two rescuers d) 15:2 with only one rescuer e) I do not know how the answer</p>
<p>8. In a non-traumatic victim, airway permeabilization can be done by:</p> <p>a) Elevation of the mento b) Heimlich Maneuver c) Aspiration of the airways d) Opening of the airways with the help of the oropharyngeal cannula (Guedel) e) I do not know how the answer</p>
<p>9. In a trauma victim, how to open the airway?</p> <p>a) Raise the head protecting the cervical spine b) Carefully tilt his/her head back c) Anteriorizing the mandible d) Raise the victim's chin without exerting pressure on the neck e) I do not know how the answer</p>
<p>10. What is the best way to ventilate the patient during CPR maneuvers until the arrival of the medical staff in the in-hospital environment?</p> <p>a) Orotracheal intubation b) Bag-valve-mask enriched with O₂ c) Mouth-mouth maneuver with the aid of the oropharyngeal cannula (Guedel) d) Glasses type nasal catheter e) I do not know how the answer</p>

Continue...

... continued

11. When performing automatic external defibrillation, check the alternative with the correct sequence:

- I- If the shock is indicated, press the button to trigger the shock
- II- Fix the self-adhesive paddles on the victim's chest
- III- Switch on the DEA
- IV - Move away the victim to the AED to analyze the rhythm

- a) III, II, I, IV
- b) III, I, II, IV
- c) III, II, IV, I
- d) III, IV, II, I
- e) I do not know how the answer

12. In cardiograph, what are the rhythm patterns found in CRA?

- a) Pulseless ventricular tachycardia (PVT)
- b) Ventricular fibrillation (VF) and Asystole
- c) Pulseless electrical activity (PEA)
- d) All of the above are correct
- e) I do not know how the answer

13. What is the time interval during which the heart rate is evaluated during CPR and VF?

- a) At every minute and after administration of the drugs
- b) Only after the compression/ventilation cycles
- c) Every 2 minutes of CPR from defibrillation
- d) At all times
- e) I do not know how the answer

14. What are non-"shockable" heart rhythms?

- a) VF and Asystole
- b) Asystole and pulseless electrical activity
- c) Pulseless TV and pulseless electrical activity
- d) Shock must be used in all PCR rhythms
- e) I do not know the answer

15. Indicate the alternative that indicates the electrical charge for defibrillation used in an AED or manual cardioverter, single-phase:

- a) 360 joules
- b) 300 joules
- c) 200 joules
- d) 120 joules
- e) 100 joules

16. Indicate the alternative that indicates the electrical charge for defibrillation used in an AED or manual cardioverter, two phases:

- a) 360 joules
- b) 300 joules
- c) 200 joules
- d) 120 joules
- e) 100 joules

17. If it is not possible to obtain venous access for the administration of the drugs, which other route(s) can be used?

- a) Arterial
- b) Intraosseous
- c) Intramuscular and Intradermal
- d) None of the above, only Endovenous
- e) I do not know how the answer

18. In relation to the drugs administered during cardiopulmonary resuscitation, it can be stated:

- a) Epinephrine is no longer used in electrical activity without a pulse
- b) Adenosine is used in cases requiring cardiac stimulation
- c) Amiodarone can be administered at a maximum dose of 300mg
- d) Vasopressin 40 IU, in a single dose, can be administered before the 1st or 2nd dose of adrenaline
- e) I do not know how the answer

the Research Ethics Committee under the number CAEE: 42678915.5.0000.5504.

RESULTS

The sample consisted of five nurses (100%), predominantly female (80%), mostly doctored (40%), followed by academic masters (20%) and specialists (20%). As for publications, 60% of them had articles dealing with areas of interest, published in journals with Qualis ≥ B1 and 20% in Qualis ≤ B2. Of all participants, only one did not answer any of the questions inherent in the professional characterization.

Regarding the variables of the study, the five experts evaluated the compound instrument for 18 items (Table 2).

DISCUSSION

Early identification of CRA is of great relevance for patient survival, since, with each passing minute, it is estimated a loss of 10% of survival probability. Therefore, the identification of CRA should be done quickly, through the simultaneous evaluation of three parameters: responsiveness, breathing and pulse.¹⁷

In this sense, for an efficient performance before a CRA, the extreme importance of the continuous training of health professionals is emphasized, so that they develop and increase their abilities, cognitive and psychomotor, so that the care of the victim of CRA is initiated as soon as it is identified.^{15,18}

In all training in the health area, the dimension of the teaching and learning process adopted, as well as the evaluation process, is emphasized. The teaching and learning process in the CPR procedure have a high degree of complexity. Likewise, the educational goal of this activity must be attained at its highest level. To assess the achievement of goals and objectives in the educational process, an evaluation practice of quality is necessary.^{5,6,18}

This practice must have at least two facets, the first of which is directed towards the learner, who can recognize the evaluation as a proof of what he has learned and the needs of support and study for the construction of new learning. The second facet is aimed at the facilitator of the educational process, who can evaluate the method practiced articulating this process, besides using the results as indicators. In this conception, the facilitator should elaborate both his educational plan and his evaluation method, based on clear guidelines and objectives.¹⁸

Thus, for evaluation to be considered a complementary mechanism of educational practice, it is important that it be conducted with certain scientific and technical rigor. Among so many forms of evaluation, the written test, when elaborated in an appropriate way, attends to the objectives presented in class, distributed in proportion to its relevance in the topic addressed. Its construction must be prepared in advance to enable learners to demonstrate their level of learning.¹⁹

The study complied with the formal requirements contained in the national and international standards regulating research involving human beings, and was approved by

Table 2 - Items of the data collection instrument validated by the evaluators/judges. São Carlos-SP, 2017

Variable	Yes		No		Total		CVI
	N	%	N	%	N	%	
1. Perform the correct CPR sequence with the use of the AED	4	80.0	1	20	5	100.0	0.80
2. Identify cardiorespiratory arrest	5	100.0	0	0	5	100.0	1.00
3. Check the carotid pulse	5	100.0	0	0	5	100.0	1.00
4. Positioning and placing the victim on a suitable surface to perform the CPR maneuvers	4	80.0	1	20	5	100.0	0.80
5. Properly position and deepen hands for chest compressions	5	100.0	0	0	5	100.0	1.00
6. Properly perform the rhythm of chest compressions	3	60.0	2	40	5	100.0	0.60
7. Carry out the compression/ventilation ratio	5	100.0	0	0	5	100.0	1.00
8. Permalize the airways in non-trauma patients	5	100.0	0	0	5	100.0	1.00
9. Opening airway in patients with trauma	4	80.0	1	20	5	100.0	0.80
10. Perform the ventilation maneuver until the arrival of the medical team	4	80.0	1	20	5	100.0	0.80
11. Install the automatic external defibrillator	5	100.0	0	0	5	100.0	1.00
12. Assess the CPR pace	5	100.0	0	0	5	100.0	1.00
13. Check heart rate time interval during CPR	5	100.0	0	0	5	100.0	1.00
14. Checking non-"shockable" heart rhythms	4	80.0	1	20	5	100.0	0.80
15. Pay attention to electrical charge with single-phase cardioverter	5	100.0	0	0	5	100.0	1.00
16. Pay attention to electric charge with biphasic cardioverter	5	100.0	0	0	5	100.0	1.00
17. Know the routes of drug administration	5	100.0	0	0	5	100.0	1.00
18. Managing Drugs During CPR	4	80.0	1	20	5	100.0	0.80

Likert scale: completely adequate or adequate = yes, partially adequate or inadequate = no; CVI = content validity index.

In health training, the test type assessment instrument can be applied in advance to verify the professionals' previous knowledge and after the training to gauge the knowledge learned by each of the participants, as well as the effectiveness of the educational method employed. Nevertheless, for its reliability, it must be submitted to validation as to content, appearance, criterion and construct.¹⁰ The instrument created and validated regarding the content in this study presented criteria that were evaluated as adequate or inadequate by the sample of evaluators.

Most of the items were evaluated as adequate and all items were judged relevant to the CPR training evaluation, however, some observations were scored by the evaluators and adapted according to suggestions.

The first item of the validated instrument corresponds to the correct sequence of CPR using the automatic external defibrillator (AED), present in the evaluation, which is necessary for the professional to be sure about this knowledge, so that the time between CPR and the application of the first shock by the defibrillator is minimized and, in this way, the continuous improvement and quality of care in PCR is guaranteed.^{2,3} However, the importance of training this item with health professionals demonstrates the relevance of being one of the evaluation criteria for teaching-learning processes in CPR.^{5,18,20}

The identification of CRA and palpation of the carotid pulse obtained the maximum agreement regarding the rele-

vance and content of the items. However, one of the experts suggested emphasizing why the carotid artery is considered the best choice for palpation of the wrist. The suggestion was accepted, and the item was retained, considering the relevance of this procedure. Studies show that health professionals have difficulty in detecting the pulse. As a result, pulse checking is no longer emphasized in the guidelines.^{18,20}

The adequate surface and the positioning of the victim to perform the maneuvers in CPR was considered pertinent by the evaluators, since the health professional, when encountering a victim in CRA, needs to be attentive to this item to guarantee quality in the chest compressions.^{2,4}

The items related to thoracic compression (5, 6, 7 and 8) were considered pertinent, since items 6 and 7 had their statements reformulated, since they presented confusion. After re-adaptation and approval, all items were maintained due to the importance of evaluating the ability of health professionals to perform chest compressions to meet the scientific literature.¹⁻⁴

In researches performed with medical and nursing professionals, previous knowledge assessments were performed with results related to unfavorable chest compressions and, after training, the results presented a much higher hit score.^{20,21} When considering chest compression one of the most important items in CPR, it is imperative that the professionals express conviction in the way of performing it.

The inclusion of the manual cardioversion between the items related to the use of the AED is considered pertinent by the evaluators, who emphasized the important professional competence when using the manual cardioversion. According to the normative opinion of the *Conselho Federal de Enfermagem* (Cofen-BR),²² in hospital settings with only manual defibrillators or cardioversions available, it is understood that only medical professionals can use them, so it is up to the nursing team to start CPR and wait for the arrival of these professionals.

Corroborating this study, in which the evaluators considered adequate the items referring to the adequate use of the AED, the literature establishes that, because it has a system capable of identifying the heart rhythms, the AED eliminates the need for interpretation of the ECG. Thus, nursing professionals can handle it and do not require the direct supervision of the nurse, thus guaranteeing immediate care and more chance of survival to the patient.^{1,2,18}

Regarding the routes of medication administration, the question was raised as to whether the intraosseous route is the only correct option available in the evaluation instrument, after the intravenous route, considering the intraosseous route of little (or none) use in most health services in the country, because they need training and adequate materials. However, even though this questioning was considered by the evaluators, they considered important the training of health professionals to administer intravenous drugs in the advanced life support, which is against the scientific literature, when emphasizing the importance of professionals having mastery of the technique of insertion, maintenance of the catheter, indications and contraindications of the insertion of the pathway.

The use of evaluation instruments of the teaching-learning process guarantees the quality of the teaching of CPR maneuvers,^{5,6,18} providing the health team with the best scientific evidence on CRA care, which is reflected in rapid, simultaneous and effective communication assistance.²⁻⁵ The achievement of the best patient prognosis correlates with the effectiveness of the multidisciplinary team, in which the success factor is the quality of teaching.^{1,5,18,20} It should be noted that the final instrument for the evaluation of training in CPR was composed of 18 items with strong validation evidences that should later be submitted to validation criteria studies to verify their effectiveness.

CONCLUSION

The instrument, based on international guidelines for cardiopulmonary resuscitation, in its final version, after the content and appearance validation process, presents 18 items aimed at assessing the impact and quality of training of health professionals in the care of victims of cardiorespiratory arrest.

ACKNOWLEDGMENTS

To the *Conselho Nacional de Desenvolvimento Científico e Tecnológico* (CNPq), for the financing for Marina Germani Lucas.

REFERENCES

- Gonzalez MM, Timerman S, Gianotto-Oliveira R, Polastri TF, Canesin MF, Schimidt A, et al. Diretriz de ressuscitação cardiopulmonar e cuidados cardiovasculares de emergência da Sociedade Brasileira de Cardiologia. *ArqBrasCardiol*. 2013[cited 2017 Jan 17];101(Supl.3):1-221. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0066-782X2013000200001
- American Heart Association (AHA). Atualização das diretrizes de RCP e ACE. Guideline 2015-2016. [cited 2017 Dec 16]. Available from: <https://ecguidelines.heart.org/wp-content/uploads/2015/10/2015-AHA-Guidelines-Highlights-Portuguese.pdf>
- Perkins GD, Handley AJ, Koster RW, Castréne M, Smyth MA, Olasveengen T, et al. European resuscitation council guidelines for resuscitation 2015: section 2. Adult basic life support and automated external defibrillation. *Resuscitation*. 2015[cited 2017 Jan 12];95:81-99. Available from: <http://erguidelines.elsevierresource.com/european-resuscitation-council-guidelines-resuscitation-2015-section-2-adult-basic-life-support-and/fulltext>
- Soar J, Nolan JP, Böttiger BW, Perkins GD, Lott C, Carli P, et al. European resuscitation council guidelines for resuscitation 2015: section 3. Adult advanced life support. *Resuscitation*. 2015[cited 2017 Feb 15];95:100-47. Available from: <http://erguidelines.elsevierresource.com/european-resuscitation-council-guidelines-resuscitation-2015-section-3-adult-advanced-life-support/fulltext>
- Greif R, Lockey AS, Conaghanc P, Lippert A, Vries W, Monsieurs KG, et al. European resuscitation council guidelines for resuscitation 2015: section 10. Education and implementation of resuscitation. *Resuscitation*. 2015[cited 2017 Mar 11];95:288-301. Available from: <http://erguidelines.elsevierresource.com/european-resuscitation-council-guidelines-resuscitation-2015-section-10-education-and-implementation/fulltext>
- Ferreira DF, Timerman A, Stapheton E, Timerman S, Ramires JAF. Aplicação prática do ensino em emergências médicas. *Rev SocCardiol*. 2011[cited 2017 Aug 17];11(2):505-11. Available from: http://www.scielo.br/pdf/reeusp/v49n6/pt_0080-6234-reeusp-49-06-0908.pdf
- Lima NDC, Silva VM, Beltrão BA. Construção e validação de conteúdo de instrumento de coleta de dados em unidade neonatal. *Rev Rene*. 2009[cited 2017 Jan 17];10(3):97-106. Available from: <http://www.revistarene.ufc.br/revista/index.php/revista/article/view/542/pdf>
- Natalio MA, Faria CDCM, Teixeira-Salmela LF, Michaelsen SM. Content validation of a clinical assessment instrument for stair ascent and descent in individuals with hemiparesis. *Braz J PhysTher*. 2014[cited 2017 June 10];18(4):353-63. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/25054384>
- Tannure MC, Chianca TCM, Bedran T, Werli A, Andrade CR. Validação de instrumentos de coleta de dados de enfermagem em unidade de tratamento intensivo de adultos. *REME - Rev Min Enferm*. 2008[cited 2017 Jan 22];12(3):370-80. Available from: <http://www.reme.org.br/artigo/detalhes/279>.
- Bellucci Júnior JA, Matsuda LM. Construção e validação de instrumento para avaliação do acolhimento com classificação de risco. *RevBrasEnferm*. 2012; 65(5):751-7. [cited 2017 Mar 30]. Available from: <http://bases.bireme.br/cgi-bin/wxislind.exe/iah/online/?IscScript=iah/iah.xis&src=google&base=BDEFN&lang=p&nextAction=lnk&exprSearch=16349&indexSearch=ID>
- Martins GA. Sobre confiabilidade e validade. *RBGN*. 2006[cited 2017 Dec 25];8(20):1-12. Available from: <http://www.redalyc.org/html/947/94782002/>
- Alexandre NMC, Coluci MZO. Validade de conteúdo nos processos de construção e adaptação de instrumentos de medidas. *Ciênc Saúde Coletiva*. 2011[cited 2017 July 14];16(7):3061-8. Available from: <http://www.redalyc.org/html/630/63019107006/>

13. Silva MAR, Vedovato TG, Lopes MHBM, Monteiro MI, Guirardello EB. Estudos de validação na enfermagem: revisão integrativa. *Rev Rene*. 2013[cited 2017 June 12];14(1):218-28. Available from: <http://www.redalyc.org/html/3240/324027985024/>
14. Ludikhuize J, Brunsveld-Reinders AH, Dijkgraaf MG, Smorenburg SM, Rooij SE, Adams R, *et al*. Outcomes associated with the nationwide introduction of rapid response systems in the netherlands. *CritCare Med*. 2015[cited 2017 July 17];43(12):2544-51. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/26317569>
15. Polit DF, Beck CT, Hungler BP. Fundamentos de pesquisa em enfermagem: avaliação de evidências para a prática de enfermagem. Porto Alegre: Artmed; 2011.
16. Sampieri RH, Collado CF, Lucio PB. Metodologia da pesquisa. Porto Alegre: AMGH; 2013.
17. Morais DA, Carvalho DV, Correa AR. Parada cardíaca extra hospitalar: fatores determinantes da sobrevida imediata após manobras de ressuscitação cardiopulmonar. *Rev Latino-Am Enferm*. 2014[cited 2017 Aug 27];22(4):562-8. Available from: http://www.scielo.br/pdf/rlae/v22n4/pt_0104-1169-rlae-22-04-00562.pdf
18. Kawakame PMG, Miyadahira AMK. Avaliação do processo ensino-aprendizagem de estudantes da área da saúde: manobras de ressuscitação cardiopulmonar. *Rev Esc Enferm USP* [Internet]. 2015[cited 2017 Aug 22];49(4):657-64. Available from: <https://www.revistas.usp.br/reesp/article/view/103402>
19. Carneiro VF, Pequeno AMC, Machado MFAS, Aguiar DML, Carneiro C, Carneiro RF. Avaliação da aprendizagem: concepções e olhares de docentes do curso de odontologia. *Rev Ibero-AmEst Educ*. 2017[cited 2017 Aug 22];12(esp):900-15. Available from: <http://seer.fclar.unesp.br/iberoamericana/article/view/8486>.
20. Meira Júnior LE, Souza FM, Almeida LC, Veloso GGV, Caldeira AP. Avaliação de treinamento em suporte básico de vida para médicos e enfermeiros da atenção primária. *Rev Bras Med Fam Comunidade*. 2016[cited 2017 Nov 18];11(38):1-10. Available from: <https://www.rbmf.org.br/rbmf/article/view/1231/815>
21. Kalhori RP, Jalali A, Naderipour A, Almasi A, Khavasi M, Rezaei M, *et al*. Assessment of Iranian nurses and emergency medical personnel in terms of cardiopulmonary resuscitation knowledge based on the 2010 guideline. *Irã J Nurs Midwifery Res*. 2017[cited 2017 Oct 15];22(3):184-9. Available from: <http://www.ijnmrjournal.net/article.asp?issn=1735-9066;year=2017;volume=22;issue=3;page=184;epage=189;aulast=Kalhori>
22. Miyadahira AMK. Capacidades motoras envolvidas na habilidade psicomotora da técnica de ressuscitação cardiopulmonar: subsídios para o processo ensino-aprendizagem. *Rev Esc Enferm USP*. 2001[cited 2018 Jan 21];35(4):366-73. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0080-62342001000400009&lng=pt.
23. Petitpas F, Guenezan J, Vendevre T, Scepim O, Oriot D, Mimosoz O. Use of intraosseous access in adults: a systematic review. *Crit Care*. 2016[cited 2017 Feb 21];20:102. Available from: <https://ccforum.biomedcentral.com/articles/10.1186/s13054-016-1277-6>