

The Knowledge and Acting of a Nursing Team from a Sector of Cardiorespiratory Arrest Urgent Care

Conhecimento e Atuação da Equipe de Enfermagem de um Setor de Urgência no Evento Parada Cardiorrespiratória

Conocimiento y Actuación del Equipo de Enfermería de un Sector de Urgencia en el Evento Parada Cardiorrespiratoria

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How to quote this article:

Moura JG, Brito MPS, Rocha GOS, *et al.* The Knowledge and Acting of a Nursing Team from a Sector of Cardiorespiratory Arrest Urgent Care. *Rev Fund Care Online*.2019. Apr./Jul.; 11(3):634-640. DOI: <http://dx.doi.org/10.9789/2175-5361.2019.v11i3.634-640>

ABSTRACT

Objective: The study's purpose has been to describe the knowledge and performance of an urgency nursing team of the University Hospital from the *Universidade Federal do Vale do São Francisco* in *Petrolina* city, *Pernambuco* State, with regards to the cardiorespiratory arrest event. **Methods:** It is a descriptive and cross-sectional study with a quantitative approach, which was carried out through a non-probabilistic sample of 101 nursing professionals who answered a questionnaire. Data were analyzed by observing the frequencies of each isolated response and the crossing of variables. **Results:** Twenty-three nurses and 78 nurse technicians were interviewed. Regarding the detection of a cardiorespiratory arrest, immediate conduct, and the actions of both the basic life support and advanced life support, most professionals answered in a partially correct way. **Conclusion:** The low percentage of totally correct answers evidences the need to update the entire nursing team, maintaining the uniformity of the professional performance, thus improving the care provided to the patient showing serious health condition.

Descriptors: Cardiac Arrest, Cardiopulmonary Resuscitation, Critical Care, Urgent Care.

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RESUMO

Objetivo: Descrever o conhecimento e atuação da equipe de enfermagem da urgência do Hospital Universitário da Universidade Federal do Vale do São Francisco de Petrolina/PE, perante o evento PCR. **Métodos:** Estudo quantitativo, descritivo e transversal por uma amostragem não probabilística de 101 profissionais de enfermagem que responderam a um questionário. Os dados foram analisados por meio da observação das frequências de cada resposta isolada e do cruzamento de variáveis. **Resultados:** Foram entrevistados 23 enfermeiros e 78 técnicos de enfermagem. Com relação à detecção de PCR, conduta imediata, ações de SBV e SAV, a maioria dos profissionais respondeu de maneira parcialmente correta. **Conclusão:** O baixo percentual de respostas totalmente corretas, evidencia a necessidade de atualização de toda a equipe de enfermagem, mantendo a uniformidade das condutas, melhorando assim o atendimento prestado ao paciente grave.

Descritores: Parada Cardíaca, Ressuscitação Cardiopulmonar, Cuidados Críticos, Atendimento de Urgência.

RESUMEN

Objetivo: Describir el conocimiento y actuación del equipo de enfermería de la urgencia del Hospital Universitario de la Universidad Federal del Valle del São Francisco de Petrolina / PE, ante el evento PCR. **Métodos:** Estudio cuantitativo, descriptivo y transversal por un muestreo no probabilístico de 101 profesionales de enfermería que respondieron a un cuestionario. Los datos fueron analizados por medio de la observación de las frecuencias de cada respuesta aislada y del cruce de variables. **Resultados:** Fueron entrevistados 23 enfermeros y 78 técnicos de enfermería. Con respecto a la detección de PCR, conducta inmediata, acciones de SBV y SAV, la mayoría de los profesionales respondió de manera parcialmente correcta. **Conclusión:** El bajo porcentaje de respuestas totalmente correctas, evidencia la necesidad de actualización de todo el equipo de enfermería, manteniendo la uniformidad de las conductas, mejorando así la atención prestada al paciente grave.

Descriptores: Parada Cardíaca, Resuscitación Cardiopulmonar, Cuidados Críticos, Atención de Urgencia.

INTRODUCTION

Cardiorespiratory Arrest (CRA) is clinically described as abrupt interruption of heart rate, respiratory movements and loss of consciousness, causing irreversible brain damage and death if Cardiopulmonary Resuscitation (CPR) maneuvers are not performed immediately.^{1,2,3} It is the most emergency situation attended in the prehospital and hospital environment, where approximately 95% of the patients with CRA die before they even reach hospital.⁴

Soon after a CRA, the performed maneuvers are called CPR and are intended to keep oxygenated blood flowing to the brain and other vital organs until the return of spontaneous circulation and the reestablishment of homeostasis. These well-executed and performed resuscitation maneuvers can double and even triple the patient's chance of survival since they are the best chance for recovery of cardiopulmonary and cerebral function.^{1,2,3}

Approximately 200,000 CRAs are estimated to occur annually in Brazil, of which 50% occur in the hospital service and the other 50% in the out-of-hospital setting.⁵

Considering the causes of CRA, 78% are diagnosed, and in 69% the professionals start the CPR as soon as possible.⁶

These data directly affect the performance of health professionals in the treatment of CRA, since they must be more and more prepared to act in extreme cases.⁷

In October 2015, the new recommendations of the American Heart Association (AHA) Guidelines for CPR and Cardiovascular Emergency Care (CEC) were published so that lay rescuers and health professionals who perform CPR maneuvers emphasis on resuscitation and its most relevant recommendations.⁸

In CRA, time is crucial, it is estimated that for each minute that the patient is left without CPR maneuvers, there is a reduction of approximately 10% in their chance of survival, leading to higher mortality in out-of-hospital settings without intervention of the Basic Life Support (BLS) and Advanced Life Support (ALS) maneuvers are essential to prevent patient deterioration and thus prevail in the maintenance of cerebral and coronary perfusion.⁹

Because CRA is an unexpected event, it requires the health professional to quickly recognize and initiate CRA maneuvers immediately. In order for the care provided to have an effective result, it is essential that the professionals must be aware of their role in patient care and that they act quickly and efficiently, with the necessary technical skills in the performance of the action.¹⁰

Because they spend more time with the patient providing care, nurses play an important role in CRA because they are often the first to come across the CRA situation and initiate resuscitation maneuvers.¹ Therefore, they must be technically prepared to act in response to this challenge, knowing how to recognize CRA and adequately provide the necessary assistance, considering that the prognosis of the patient is directly associated with the speed and effectiveness of the actions.⁹ The conducts performed by nurses in a CRA are still unsatisfactory, although they recognize the importance of the topic.⁶

Since the AHA guidelines for both CPR and CEC are reviewed every five years, it is necessary to conduct research that can evaluate the nursing team's knowledge of the maneuvers of CPR, since these professionals must keep constantly updated. Given the aforementioned, this study aims to describe the knowledge and performance of an urgency nursing team of the University Hospital (UH) from the *Universidade Federal do Vale do São Francisco (UNIVASF)* in *Petrolina* city, *Pernambuco* State, with regards to the cardiorespiratory arrest event.

METHODS

This is a quantitative, descriptive and cross-sectional study developed in the emergency and emergency sector of the UH-UNIVASF/EBSERH, located in *Petrolina* city, *Pernambuco* State, from February to May 2016. In this

sector, that the research was performed, the population of nurse technicians was 101 and nurses 26. Due to the small size of the population, no sample calculation was performed, and the study was carried out with all participants who agreed to collaborate with the study. The sample consisted of 101 professionals, of which 23 were nurses and 78 were nurse technicians who worked in the aforementioned sector, corresponding to 79.52% of the health professionals of this unit.

The inclusion criteria were: to work for at least 3 months in the urgency of UH-UNIVASF/EBSERH, since the Institution had undergone recent administrative changes by hiring new professionals and instability in the allocation of the servers in the various sectors. Exclusion criteria were, as follows: professionals who were away from activities due to vacations, prolonged leave or medical leave during the period of data collection.

For the data collection, a questionnaire structured with twenty-one questions was divided into two parts: part 01 addressed socio-demographic data, and part 02 addressed the issues related to CRA identification and CPR maneuvers. This questionnaire was adapted from the instrument validated by Bellan,¹¹ updating the questions considering the current guidelines of the AHA.⁸ The data were collected in a meeting room at the institution, individually, ensuring the confidentiality and confidentiality of the information during the hours professionals, in the morning, afternoon and evening shifts.

Each question had more than one correct alternative. The response pattern was evaluated considering the number of alternatives indicated in each question, categorized as correct answer when all the correct alternatives were pointed out; partially correct when one or more correct alternatives are no longer indicated; incorrect or did not know how to respond; considering the recent bibliography on the service to CRA. The data was tabulated with the help of Excel and Word software from Microsoft Office version 7.0 for Windows using descriptive statistics.

The analysis of the data was performed by observing the frequencies of each isolated response and the crossing of variables relating to the professional category, the time of action in the emergency and the previous qualification regarding the subject.

The project was approved by the Ethics and Deontology Committee on Studies and Research from the UNIVASF, under the *Certificado de Apresentação para Apreciação Ética (CAAE)* [Certificate of Presentation for Ethical Appraisal] No. 51387315.8.0000.5196. All participants signed the Free and Informed Consent Term.

RESULTS AND DISCUSSION

Considering the 101 professionals who participated in the research, 22.77% (n=23) were nurses and 77.23% (n=78) nurse technicians. With regards to the gender, we observed

a significantly female team with 89.11% (n=90) of the sample, and within the age group from 33 to 37 years old, then representing a percentage of 25.74% (n=26). Regarding the time of training of the nursing team, 73.27% (n=74) were formed more than 5 years, and the minority of the research participants had specialization in urgency and emergency/intensive care. Concerning the professional training to take care of a CRA event, 71.29% (n=72) had already participated, as observed in (Table 01).

Table 1 – Characterization of the nursing professionals' answers in relation to the socio-demographic profile. *Petrolina* city, *Pernambuco* State, Brazil, 2016.

Variable	Nurse		Nurse Technician	
	n	%	n	%
Research participants	23	22.77%	78	77.23%
Specialization in urgent and emergency/intensive care	6	26.09%	15	19.23%
Professional training to take care of a CRA event	19	82.61%	53	67.95%
Professional performance in the urgent care sector for more than 5 years	12	31.58%	37	47.44%

Regarding the knowledge of CRA detection through the identification of clinical signs, the majority of nurses and nurse technicians answered in a partially correct manner, and 73.26% (n=74) of the participants did not know to recognize the unconsciousness as a clinical sign of the CRA.

Considering the immediate behaviors after CRA recognition, 78.26% of the nurses and 91.03% of the technicians obtained partially correct answers (Table 02).

Concerning the possible heart rhythms found in CRA, only 39.13% (n=9) of the nurses and 1.28% (n=1) of the nurse technicians identified that without pulse ventricular tachycardia, ventricular fibrillation, electrical activity without a pulse and asystole, can be found in CRA. Furthermore, 8.97% (n=7) of the technicians did not know how to respond and 6.41% (n=5) left the question without an answer.

In the question that addresses which external rhythms are indicated, 47.83% (n=11) of the nurses and 3.85% (n=3) of the nurse technicians responded correctly, and 13.05% (n=3) of nurses and 41.02% (n=32) of nurse technicians

did not identify shocking heart rates. On the other hand, asystole with 19.80% (n=20) and Electrical Activity Without Pulse (EAWOP) with 20.79% (n=21) were cited among the shocking cardiac rhythms.

When approached about the BLS, the majority of nurses and nurse technicians answered partially correctly. Regarding the ALS, only 17.39% of the nurses and 1.28% of the technicians answered correctly (Table 02). Moreover, 30.67% (n=30) of the participants considered that the BLS corresponded only to the rapid recognition of CRA and 8.91% (n=9) of the professionals failed to indicate the alternative that included the defibrillator as part of the BLS.

Table 2 – Characterization of the nursing professionals' answers in relation to the detection of a CRA event, immediate conduct and identification of the maneuvers of both BLS and ALS. *Petrolina* city, *Pernambuco* State, Brazil, 2016.

Variable	Nurse		Nurse Technician	
	n = 23	100%	n = 78	100%
Detection of the CRA				
Partially correct	17	73.91	64	82.05
Correct	6	26.09	11	14.10
Incorrect	-	-	1	1.28
Did not answer	-	-	2	2.56
Immediate conduct				
Partially correct	18	78.26	71	91.03
Correct	5	21.74	6	7.69
Did not answer	-	-	1	1.28
Actions of the BLS				
Partially correct	20	86.96	67	85.90
Correct	3	13.04	3	3.85
Incorrect	-	-	5	6.41
Did not answer	-	-	3	3.85
Actions of the ALS				
Partially correct	4	82.61	71	91.03
Correct	19	17.39	1	1.28
Incorrect	-	-	6	7.69

When evaluating the response pattern according to the time of emergency action, it was observed in relation to the clinical signs for the detection of CRA that, the professionals with the shortest time of operation in the emergency had a higher frequency of correct responses when compared to those with longer time in the emergency. Regarding the actions of the ALS, regardless of the time of action, few participants correctly answered the question, as presented in Table 3.

Table 3 – Characterization of the nursing professionals' answers in relation to the detection of a CRA event, immediate conduct and identification of the maneuvers of both BLS and ALS, by considering the professional work time in the urgent care sector. *Petrolina* city, *Pernambuco* State, Brazil, 2016.

Variable	Professional work time in the urgent care sector							
	3 to 11 months		1 to 2 years		3 to 4 years		≥ 5 years	
	n=39	n=15	n=7	n=40	n=39	n=15	n=7	n=40
Detection of the CRA								
Partially correct	30	76.92	13	86.67	4	57.14	34	85
Correct	9	23.08	-	-	3	42.86	5	12.5
Incorrect	-	-	-	-	-	-	1	2.5
Did not answer	-	-	2	13.3	-	-	-	-
Immediate conduct								
Partially correct	32	82.05	14	93.33	7	100	36	90
Correct	7	17.95	1	6.67	-	-	3	7.5
Did not answer	-	-	-	-	-	-	1	2.5
Actions of the BLS								
Partially correct	33	84.62	14	93.33	7	100	33	82.5
Correct	3	7.69	1	6.67	-	-	2	5
Incorrect	1	2.56	-	-	-	-	4	10
Did not answer	2	5.13	-	-	-	-	1	2.5
Actions of the ALS								
Partially correct	35	89.74	13	86.67	6	85.71	36	90
Correct	2	5.13	1	6.67	1	14.29	1	2.5
Incorrect	2	5.13	1	6.67	-	-	3	7.5

Table 4 shows that the majority of professionals (71.29%) had prior training on the subject. Among those who performed previous training, the index of correct answers was higher when compared with those who had not performed any type of professional training.

Table 4 – Characterization of the nursing professionals' answers in relation to the detection of a CRA event, immediate conduct and identification of the maneuvers of both BLS and ALS, by considering the previous professional training. *Petrolina* city, *Pernambuco* State, Brazil, 2016.

Variable	Previous professional training			
	Yes		No	
	n=72	%	n=29	%
Detection of the CRA				
Partially correct	56	77.78	25	86.21
Correct	14	19.44	3	10.34
Incorrect	-	-	1	3.45
Did not answer	2	2.78	-	-
Immediate				

conduct				
Partially correct	64	88.89	25	86.21
Correct	8	11.11	3	10.34
Did not answer	-	-	1	3.45
Actions of the BLS				
Partially correct	63	87.5	24	82.76
Correct	5	6.94	1	3.45
Incorrect	2	2.78	3	10.34
Did not answer	2	2.78	1	3.45
Actions of the ALS				
Partially correct	64	88.89	23	89.66
Correct	5	6.94	-	-
Incorrect	3	4.17	3	10.34

Overall, when participants were questioned about ventilation maneuvers in the non-intubated patient, 51.49% (n=52) responded partially correctly, and 6.4% (n=5) of nurse technicians either did not know or did not answer the question. And in the ventilation maneuvers in the intubated patient, 57.43% (n=58) of the professionals also responded in a partially correct manner, and 7.69% (n=6) of the nurse technicians did not know or did not answer the question.

Concerning the correct positioning of the hands during external cardiac compression, 69.57% (n=16) of the nurses and 83.33% (n=65) of the technicians answered partially correct, in addition, 7.69% (n=6) of the nurse technicians did not know how to respond and 2.56% (n=2) left the question without an answer. Regarding adequate posture during cardiac compressions, only 8.91% (n=9) of the professionals obtained correct answers.

Regarding the initial load of defibrillation, 13.04% (n=3) of the nurses and 50.0% (n=39) of the nurse technicians did not know how to answer the question. Likewise, 30.43% (n=7) of the nurses and 17.95% (n=14) of the nurse technicians responded incorrectly. In addition to 3.96% (n=4) leave the question without an answer.

Considering the routes of administration for drugs, 93.59% (n=73) of the nurse technicians and 65.22% (n=15) of the nurses responded in a partially correct manner, failing to indicate the intraosseous routes, 55.44% (n=56) and intratracheal, 47.52% (n=48). Vis-à-vis the medicines used in resuscitation and post-resuscitation, 94.87% (n=74) of the nurse technicians and 91.30% (n=21) of the nurses answered partially correctly and still maintaining atropine and vasopressin as a choice of drugs in CPR.

When participants were approached about the composition of the emergency cart, 80.20% (n=81) responded partially correct. And with regards to the most recent update of the AHA guidelines, 49.50% (n=50) of the professionals answered the question incorrectly and 1.98% (n=3) left the question without an answer.

The results of this research confirm that the nursing team is formed in its majority by female professionals, as found in other studies.^{12,13,14} The most prevalent age group between 33 and 37 years old is also consistent with the findings of other authors.¹²

Among the participants of the study, the majority of nursing professionals were observed and this is related to the fact that the middle-level servants of the nursing field make up the largest workforce of the hospital service. Other research also corroborates this superiority in the number of nurse technicians.^{12,13}

When analyzing all the professionals involved in the research on the classical signs of recognition of a CRA, most responded in a partially correct way, failing to correctly identify all clinical signs. This differs from other studies.^{13,15} Here, the fact that unconsciousness as a clinical sign of an CRA is the least often indicated by professionals. This data was also found in another study.¹² Although unconsciousness is one of the clinical signs of CRA; it may be related to other alterations and, for this reason, may interfere with confirmation of the diagnosis of CRA.¹⁶

According to the new recommendations of the AHA guidelines for both CPR and CEC, the clinical signs of CRA are unconsciousness (lack of responsiveness), absent breathing or gasping, and absence of a pulse. The early recognition of these signs allows faster intervention with the immediate onset of resuscitation maneuvers, which provides greater survival to the affected individuals.⁸

Regarding the knowledge of the immediate conduct after CRA recognition, the majority of nurses and technicians presented partially correct answers. This data is relevant since the prognosis after the occurrence of CRA is directly linked to the early diagnosis and to the immediate conduct taken after its recognition. Therefore, when CRA is detected, the intervention is performed immediately, the survival rate is 75% for the first four minutes, 15% for four to 12 minutes, and only 5% after 15 minutes.¹⁵

In addition to the identification of clinical signs, the diagnosis of CRA involves the recognition of the cardiac rhythm of the arrest, its cause and the actions that will be taken to reverse the CRA.¹⁷ In this study, the minority of nurses and nurse technicians recognized all rhythms: non-pulse ventricular tachycardia, ventricular fibrillation, pulseless electrical activity, and asystole.⁸ What differs from another study, in which 60% of professionals answered correctly about the possible rhythms found in CRA.¹³

Recognition of the rhythm and clinical history of the patient enables immediate behavior without loss of time, since rapid actions are essential.¹⁷

Another important point that this study observed was the low level of knowledge of the nursing team regarding the heart rhythms that has indication of defibrillation and the initial load for this one. Moreover, asystole and EAWOP were frequently cited among shocking heart rates. These results may be related to the fact that the nursing team associates the

knowledge of these rhythms and the use of the defibrillator as the responsibility of the medical team.^{12,13}

It is critical that health care providers who are providing care for CRA victims also be able to identify the four heart rhythms, since, for the two shockable rhythms: pulseless ventricular tachycardia and ventricular fibrillation, defibrillation is essential and must be performed as soon as possible.

Herein, the minority of nurses and technicians knew the sequence of care for both BLS and ALS. Furthermore, few participants considered that BLS corresponds only to the rapid recognition of CRA. The rapid identification of the event together with the knowledge of how to act and the timing of the nursing team are elements that contribute to the success of CPR and patient survival. Therefore, it is essential that the team has skill and knowledge about the recommended sequence of attendance to CRA.¹⁵

The relationship between the time of training of the nursing team and the knowledge of these professionals about the signs of CRA was greater in the group that had between 3 and 4 years of work in the emergency, yet, the percentage of correct answers in relation to the and BLS maneuvers were higher in professionals with shorter actuation time. It is worth mentioning that, regarding the actions of ALS with a minimum number of professionals who had more than 5 years of acting in the emergency, it answered the question correctly. The data found in this research contrasts a study that refers to the fact that training time related to the time of service in emergency is a major factor in care, since it can help in the early identification of signs of worsening of patients and in the prevention of stressful events, as CRA/CPR, among the nursing team.⁴

Most of the professionals had previous training on the subject, and the index of correct answers was higher in this group when compared with those who had not performed any type of training. However, it is worth mentioning that the number of partially correct answers prevailed in all questions both among those who had participated in some training on the subject and those who had not participated. These data corroborate with a research that evidenced that this result must take into account the interval and the frequency that has been carried out updating of these capacities, since these actions go through periodic changes.¹²

Training should be carried out regularly, at intervals not exceeding six months, and the setting of knowledge and the maintenance of technical skills are directly linked to experience and application in practice.^{15,17} Furthermore, scientific knowledge and resourcefulness practice of nursing professionals are among the determinants of success in CPR.¹⁷

It is also important to highlight in this study the low percentage of correct responses in relation to ventilation maneuvers in the intubated and non-intubated patient, since in the emergency there are severe patients intubated in mechanical ventilation, which requires professionals working in this sector the knowledge of resuscitation maneuvers in this situation.¹² In the non-intubated patient, ventilation should be

performed manually (*Ambú*)[®] with mask and supplemental oxygen, in relation to 2 ventilations after 30 compressions, with each ventilation being administered in 1 second, causing elevation of chest. In the intubated patients the ventilation will also be performed manually (*Ambú*)[®] with supplemental oxygen, asynchronous with the compressions, administering 1 ventilation every 6 seconds (10 breaths per minute), while continuous chest compressions are applied.⁸

It is importantly to highlight that the majority of nursing professionals showed a low percentage of correct answers about chest compressions. Once CRA care is started, chest compressions are extremely important since they guarantee the supply of blood flow, bringing oxygen and energy to vital organs. Thus, chest compression is directly linked to the increase in the survival of CRA victims, when done in place, depth and correct frequency.¹⁵

In 2015 the new recommendations of the AHA Guidelines were launched with some changes, in which: they emphasize high quality and more emphasized CPR with appropriate chest compression depth and depth, allowing the chest to fully return between compressions, minimizing interruptions compressions and avoiding excessive ventilation.⁸

In relation to the routes of administration of the drugs and the medications used in resuscitation and post-resuscitation, a low success rate was also observed. Another important point in this study was that atropine and vasopressin were still mentioned as drugs used in CRA. Atropine is no longer recommended in the routine and in the treatment of electrical activity without pulse and asystole, being withdrawn from the ALS algorithm for CRA since 2010.¹⁸ In 2015 there was another change in the ALS algorithm for CRA in adult, vasopressin was also withdrawn, since, vasopressin provides no advantage over adrenaline alone.⁸

In the composition of the emergency cart, the majority of respondents answered partially correctly. Knowing what is contained in the emergency cart and the organization of the medicines, equipment, and materials that compose it, can mean the success of the service in CRA.¹⁶

Most respondents were not able to identify the frequency of updates to the resuscitation guidelines and did not recognize that the recommendations of the AHA guidelines for both CPR and CEC were updated in October 2015. These guidelines lead actions in emergency situations, then facilitating and improving the decision-making process in relation to CRA.⁵

CONCLUSIONS

CRA is an intercurrent that demands of the nursing professionals the scientific knowledge and the technical ability to act in such a situation since these professionals are the most often the first to identify and initiate the resuscitation maneuvers. In this sense, effective and properly performed resuscitation in a timely manner becomes a determining factor in survival rates in cases of CRA.

The low percentage of correct answers in this research evidenced the need to update the entire nursing team, with continuous and periodic theoretical and practical training on the actions performed before a CRA, with the objective of the professionals providing the assistance fast, safe and effective in what is recommended, maintaining the uniformity of the conducts between the teams and thus improving the care provided to the patient showing serious health condition. These results indicate the need for a permanent approach to the subject, as well as show necessity of searching for new knowledge and skills in the profession, in order to ensure the patient well-being and to provide quality care.

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Received on: 07/09/2017
Required Reviews: 09/04/2017
Approved on: 09/11/2017
Published on: 04/02/2019

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The authors claim to have no conflict of interest.