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REVIEW ARTICLE

Nurse skills in cardiorespiratory arrest

Habilidades de enfermería en parada cardiorrespiratoria

Competências do enfermeiro na parada cardiorrespiratória

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Abstract

The aim was to identify, in the light of literature, the main competencies of nurses in the face of cardiorespiratory arrest. This is an integrative review of the literature, data were collected through the databases Higher Education Personnel Improvement Portal and Scientific Electronic Library Online, as they are electronic libraries/databases that bring together national and international studies of scientific relevance. The inclusion criteria were studies published in full between 2017 and 2022, in Portuguese, theses, dissertations and articles not consistent with the objective of the research were excluded. Nine articles were analyzed that met the inclusion criteria, among them nine were carried out in Brazil, four published in 2018, one in 2019 and four in 2021. After reading the full in selected studies, representative categories were chosen, namely: knowledge, communication, skills, attitudes, and values. Cardiovascular diseases occupy the first place in the mortality ranking in the world, the nurse is an essential professional in the pre-hospital urgency and emergency team, playing an extremely important role in the assistance provided based on skills.

Descriptors: Nurse; Cardiopulmonary Arrest; Professional Qualification; Pre-Hospital Care; Nurse's Role.

Resumén

El objetivo fue identificar, a la luz de la literatura, las principales competencias del enfermero ante la parada cardiorrespiratoria. Se trata de una revisión integradora de la literatura, los datos fueron recolectados a través de las bases de datos Portal de Aperfeiçoamento de Pessoal de Ensino Superior y Scientific Electronic Library Online, por ser bibliotecas/bases de datos electrónicas que reúnen estudios nacionales e internacionales de ciencia. Relevancia. Los criterios de inclusión fueron estudios publicados íntegramente entre 2017 y 2022, en portugués, siendo excluidos tesis, disertaciones y artículos no coherentes con el objetivo de la investigación. Se analizaron nueve artículos que cumplieron con los criterios de inclusión, entre ellos nueve fueron realizados en Brasil, cuatro publicados en 2018, uno en 2019 y cuatro en 2021. Después de la lectura completa de los estudios seleccionados, representativos, se eligieron categorías, a saber: conocimientos, comunicación, habilidades, actitudes y valores. Las enfermedades cardiovasculares ocupan el primer lugar en el ranking de mortalidad en el mundo, la enfermera es un profesional imprescindible en el equipo de urgencia y emergencia prehospitalaria, desempeñando un papel sumamente importante en la asistencia brindada en base a habilidades.

Descriptores: Enfermera; Paro Cardiopulmonar; Cualificación Profesional; Atención Pre Hospitalaria; Papel de la Enfermera.

Resumo

Objetivou-se identificar a luz da literatura as principais competências do enfermeiro frente à parada cardiorrespiratória. Trata-se de uma revisão integrativa da literatura, os dados foram coletados atraves das bases de dados Portal de Aperfeiçoamento de Pessoal de Nível Superior e *Scientific Electronic Library Online*, pois se tratam de bibliotecas eletrônicas/bases de dados que reúnem estudos nacionais e internacionais de relevância cientifica. Os critérios de inclusão foram estudos publicados na integra entre 2017 e 2022, em português, foram excluidos teses, dissertação e artigos não condizentes com o objetivo da pesquisa. Analisou-se nove artigos que atenderam aos critérios de inclusão, dentre eles nove foram realizados no Brasil, quatro publicados no ano de 2018, um em 2019 e quatro em 2021. Após a leitura na integra dos estudos selecionados, foram elecadas categorias representativas a saber: o conhecimento, a comunicação, as habilidades, atitudes e valores. As doenças cardiovasculares acupam o primeiro lugar no raking de mortalidade no mundo, o enfermeiro é um profissional indispensável na equipe de urgência e emergência pré-hospitalar possuindo um papel de extrema relevancia na assistencia prestada pautada em competências.

Descritores: Enfermeiro; Parada Cardiorrespiratória; Formação Profissional; Atendimento Pré-Hospitalar; Papel do Enfermeiro.

Introduction

Cardiorespiratory arrest (CPA) consists of the cessation of the electrical and mechanical activities of the heart followed by the interruption of the breathing process[1], constitui a principal emergência cardiovascular multifatorial with a high prevalence of morbidity and mortality worldwide[1,2]. Among the main prevalent risk factors pointed out in the literature are: sedentary lifestyle, poor diet, high cholesterol levels, thrombus formation, high stress, and decreased quality of life followed by other comorbidities such as hypertension and diabetes[2,3].

In Brazil, records on CPA are still scarce, the Brazilian Society of Cardiology (SBC) estimates approximately 200,000 CPAs in Brazil, and half of the cases occur in extra-hospital environments such as homes, shopping malls, stadiums, airports[1,4].

More than 1,100 people die every day worldwide from cardiovascular diseases[1], about 46 people die every hour[1,4], in 2022 alone, more than 190 thousand people were registered victims of cardiorespiratory arrest in Europe[3,4].

In view of this scenario, it is urgent that health professionals are constantly trained to act in the face of CPA, since survival rates in Brazil are high when professionals approach within the first 5 minutes with early defibrillation.

The nurse is the professional who is part of the advanced intra and extra-hospital life support teams, providing urgent and emergency care frequently in various environments, such as: emergency room, emergency room, red room, intensive care unit and ambulances (mobile care), their performance is anchored in the Professional Practice Law No. 7,498/86[5].

In addition, it is up to this professional to provide direct care to critically ill patients at risk of death, which requires scientifically based knowledge and clinical reasoning, in addition to the ability to make immediate decisions acting in the recovery and rehabilitation of health, in addition to the fact that it is the nurse's role to coordinate the actions of the nursing team in the face of CPA.

The CPA care ranges from the recognition of signs of cardiorespiratory arrest to the performance of the most advanced maneuvers, which requires the nurse to concentrate on the first 30 minutes considered critical before and after resuscitation. Cardiopulmonary resuscitation (CPR) maneuvers, service activation, application of basic life support, early defibrillation, and advanced life support constitute the chain of survival[1].

From this perspective, despite the relevance of CPA for public health, the importance of the role of nurses working in urgencies and emergencies, and the prominence of health authorities in the development of updated guidelines, studies indicate that many nurses do not perform CPR protocols in their entirety and, among the main reasons, the following stand out: insufficient training in undergraduate courses, forgetfulness of theoretical input, nervousness and lack of experience in practice[3,5].

In view of this, it is also emphasized that one of the greatest educational challenges is the promotion of significant learning that seeks to bring theory and practice closer together, so that nurses develop possibilities of articulation and clinical reasoning, to be safely applied in the daily routine of urgencies and emergencies[5,6].

Thus, to improve educational processes and reduce the gaps that involve the association between theory and practice of higher education nursing professionals, the National Curriculum Guidelines (DCN) proposed, among other alternatives, competency-based teaching[5-7].

This teaching methodology is based on the principle that meaningful learning is permeated by three pillars, namely: knowledge, skills, attitudes and values[6]. Knowledge is understood as the learning acquired in the classroom as theoretical contents, while the skill requires observable doing, that is, experimentation, getting the "hands dirty" and, finally, the attitudes and values that refer the student in the search for ethical, bioethical, and human behaviors in the exercise of the profession[5].

In summary, the competency-based education of nurses is partially reduced by the traditional teaching format, an approach plastered with pre-defined and guided contents[8].

From this perspective, it is essential to identify, in the light of the literature, the main competencies of nurses in the face of CPA, once identified, they can corroborate the improvement of nursing education and, consequently, the quality of care provided in CPA.

Methodology

This is an integrative review of the literature, which allowed the synthesis of multiple published studies and allowed conclusions about the competencies of nurses in CPA[9].

From this perspective, the present research was developed from the following stages: development of the guiding question, search of studies in the databases, extraction of data from the studies evaluated, analysis and synthesis of the results, as proposed by study[9].

It should be noted, regarding the ethical aspects of the research, that as it was an integrative review of the literature, there was no need to submit the study to the Research Ethics Committee (REC) with Human Beings, however, all the ethical principles of the proposed research were followed, in accordance with the principles recommended by Resolution No.° 466/2012 of the National Health Council.

Initially, to direct the present study, the following guiding question was elaborated: What are the competencies of nurses in relation to out-of-hospital CPA?

The search and selection of studies were carried out electronically through the internet in April and May 2023, through the following databases: Portal for the Improvement of Higher Education Personnel (CAPES), and the Scientific Electronic Library Online (SciELO), as these are electronic libraries/databases that bring together national and international studies of scientific relevance.

The descriptors used were nurse, cardiorespiratory arrest, and professional training, combined as follows: "Nurse" *AND* "Cardiorespiratory Arrest"; "Nurse" *AND* "Vocational Training"; "Respiratory Arrest" *AND* "Professional Training", according to Chart 1.

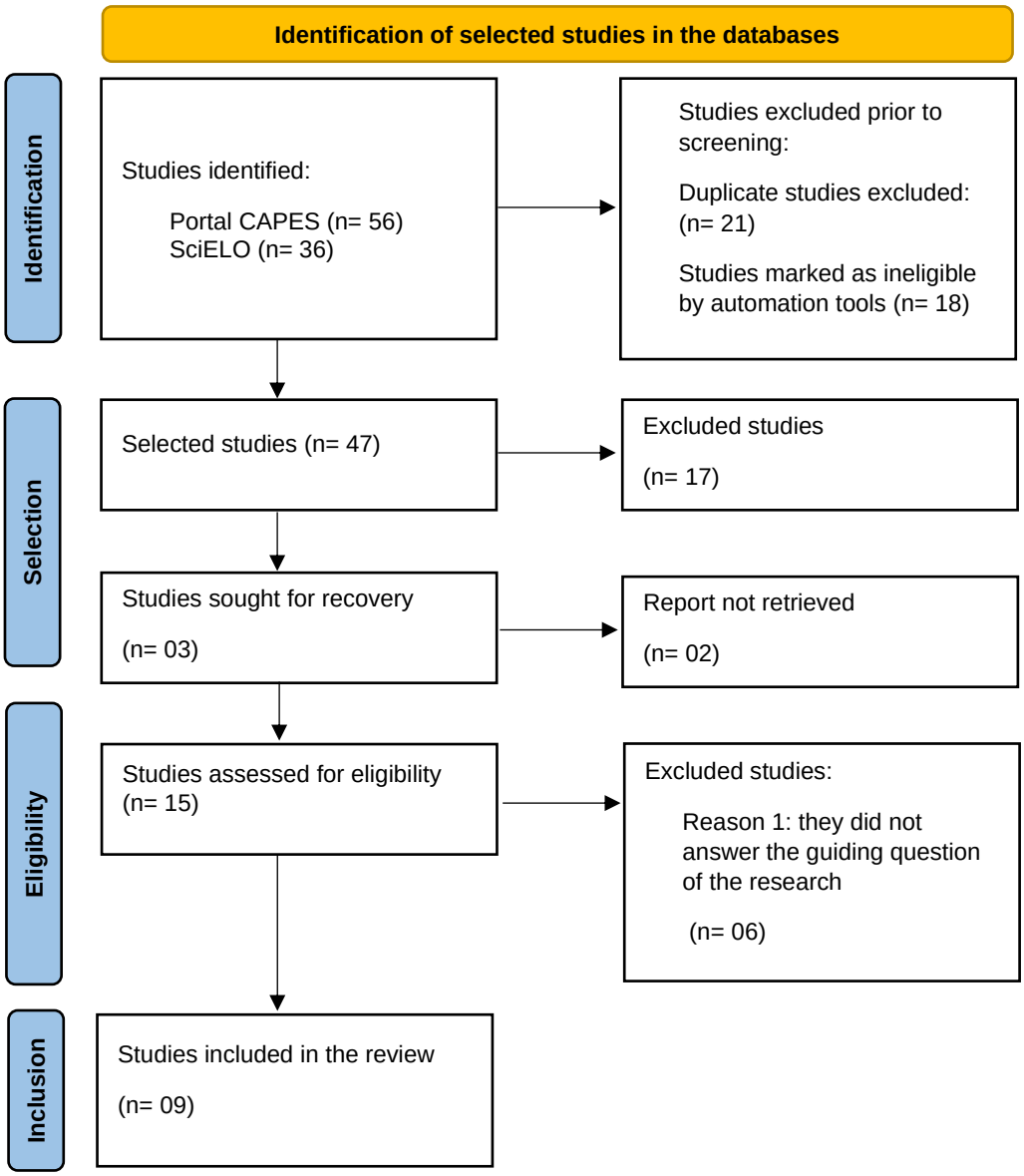
Chart 1. Cross-referencing of descriptors and selection of study articles. Serra, ES, Brazil, 2023

Crossover between descriptors - MeSH	Total Studies
"Nurse" AND "Cardiorespiratory Arrest"	92 articles
"Nurse" AND "Vocational Training"	**Deleted**
"Respiratory Arrest" AND "Vocational Training"	83 articles
Total	**09 articles**

The inclusion criteria for the pre-selection of studies were studies in Portuguese published in a national journal with a time frame of the last five years, period between 2017-2022 and addressing the main competencies of nurses in the face of cardiorespiratory arrest.

Studies that did not meet the research objective were excluded. The selection of studies was carried out by sequentially reading the titles, abstracts and, finally, reading the texts in full text.

Figure 1. Selection of studies. Serra, ES, Brazil, 2017-2022



The initial search allowed us to obtain a total of 92 articles that, after reading the titles, abstracts, and subsequent analysis of the texts in full, 83 studies were excluded, and nine articles related to the object of the research were selected.

The organization and analysis of the data were operationalized based on the definition of the information that was extracted from the selected studies.

The selected articles were read in their entirety to understand the main aspects addressed. In the interpretation of the results, a comparative reading between the articles was followed (vertical reading), verifying the similarities and proceeding to the grouping of common themes into axes to be explored (categorization).

Results and Discussion

In this integrative review, nine articles that met the previously established inclusion criteria were analyzed, and a general overview of the articles evaluated will be presented below.

Among the articles included in the integrative review, the nine studies were conducted in Brazil, four of which were published in 2018, one published in 2019, and four published in 2021.

After reading the selected studies in full, categories were listed that represent the main competencies of nurses in relation to CPA, namely: knowledge, communication, skills, attitudes, and values according to Chart 2.

Chart 2. Nurses' competencies in the face of out-of-hospital CPA. Serra, ES, Brazil, 2023

• Nurses' knowledge of out-of-hospital CPA
• Nurses' communication in the face of out-of-hospital CPA
• Nurses' skills in relation to out-of-hospital CPA
• Nurses' attitudes and values towards out-of-hospital CPA

Regarding the type of journal in which the articles included in the review were published, the following are as follows: Revista Eletrônica Actualiziza Saúde (1); ACTA Paulista Revista de Enfermagem (1); Family, Life Cycles and Health in the Social Context (1); Brazilian Journal of Cardiology (1); Electronic Journal of Health (1); Scientia Médica (1); Journal of the Brazilian Society of Cardiology of São Paulo (1); Journal of Nursing in Focus (1); Latin American Journal of Nursing (1).

There were no studies published in 2020 and 2022 regarding nurses' competencies in relation to out-of-hospital CPA, and one of the limitations of the research was the search for articles published only in Brazil. Chart 3 presents a summary of the articles included in this integrative review, ordered by journal, year, authors, title, and nurse's competence.

Chart 3. Synthesis of the studies selected in the integrative review. Serra, ES, Brazil, 2023

Journal/ Year	Authors	Title	Nurses' competencies in CPA identified in the studies
Revista Eletrônica. Atualiza Saúde 2021	Santos, APC; Marques, PB	Atuação do enfermeiro frente à parada cardiorrespiratória em ambiente extra-hospitalar	- Deficiency in theoretical knowledge. - Difficulty in team service.
ACTA Paulista Revista de Enfermagem 2021	Farias, ISA et al.	O conhecimento dos profissionais de enfermagem frente à parada cardiorrespiratória na emergência	- Poor ability to perform in CPA. -Lack of rapport in the dynamics of manual activities.
Revista Família, Ciclos de Vida e Saúde no Contexto Social 2021	Paula, CFB et al.	Parada cardiorrespiratória no atendimento pré-hospitalar	- Lack of attitude at the time of CPA. - Recognize limitations. - Do not attract the attention of a colleague in front of others.
Revista Brasileira de Cardiologia 2021	Mesquita, CT.	Parada Cardiorrespiratória Extra-Hospitalar durante a Pandemia da Doença por Coronavírus 2019 (COVID-19) no Brasil: A Mortalidade Oculta	- Recognize limitations and know how to deal with death.
HU Revista Eletrônica de Saúde 2019	Santos, APM et al.	Conhecimentos e habilidades dos profissionais da atenção primária à saúde sobre suporte básico de vida.	- Difficulty in manipulating the AED. - Difficulty communicating between team members.
Scientia Médica 2018	Nogueira, LS et al.	Avaliação dos conhecimentos e habilidades em ressuscitação cardiopulmonar assimilados por profissionais da atenção primária em saúde	- Good theoretical knowledge decreased after one year of training. -Demonstrated skill in the practice stations.
Revista da Sociedade de Cardiologia de São Paulo 2018	Guimarães, HP; Olivato, GB; Pispico, A.	Ressuscitação cardíaca pré-hospitalar, do pré-hospitalar à sala de emergência: minutos que salvam uma vida – suporte básico	- Difficulty in operationalizing the guidelines in practice. - Difficulty in passing the case.
Revista Enfermagem em Foco 2018	Barros, FRB; Neto, ML.	Parada e reanimação cardiorrespiratória: conhecimento do enfermeiro baseado nas diretrizes da American Heart Association	- The nurses showed little knowledge regarding the administration of vasoactive drugs.
Revista Latino-Americana de Enfermagem 2018	Moraes, DA; Carvalho, DV; Correia, AR	Parada cardíaca extra-hospitalar: fatores determinantes da sobrevida imediata após manobras de ressuscitação cardiopulmonar	- Lack of proactivity. - Recognize limitations and know how to deal with death. - Lack of management of technologies.

Nurses' knowledge of out-of-hospital CPA

Knowledge is an attribute resulting from what is expected from the teaching and learning process, it is through it that one has confidence to perform certain functions, especially the functions of nurses in the face of CPA, considered a phenomenon that requires knowledge about the main *guidelines* in force in our country[1,6].

In Brazil, the protocols of the American Heart Association (AHA) are used as a reference for care and a source of knowledge, which highlights the need for nurses to acquire theoretical-practical knowledge on the subject, in addition, it mentions that the protocols are updated every five years, which requires the nurse to update on the changes that occurred during this period[1].

Thus, the selected studies pointed out gaps related to nurses' knowledge of CPA, such as: forgetfulness of the theoretical contribution and knowledge about the vasoactive drugs used during CPA[11-13].

It is known that there is a great challenge for educational institutions in bringing theoretical knowledge closer to the epistemological foundations of practice, this idea is expressed by Ordinance No. 2048/2002, still in force, which considers the curricular workload of subjects that involve the knowledge framework regarding out-of-hospital PCR, such as urgency and emergency and first aid[14].

He also mentions that the subjects offered in their entirety are unable to fully achieve the skills expected of the apprentices, among the reasons the following stand out: insufficient workload to work on many contents related to the theme, lack of equipment (discharge dummies, medium and high fidelity, monitors, defibrillators, cardioverters, etc.) available for practice in laboratories, reducing the number of teachers with skills and up-to-date with AHA protocols, in addition to teaching strategies that favor evidence-based learning[1,7].

Another aspect highlighted in the studies found in this research was the difficulty in associating the mechanisms of action of the main vasoactive drugs used in out-of-hospital CPA with the critical condition of the patient in CPA. Among the most cited drugs we have norepinephrine, amiodarone and adenosine[1,6,10].

It is known that the construct of knowledge that modulates the professional's action is anchored, firstly, in learning that involves basic notions of pharmacology, semiotic and semiotic practices, PCR protocols and clinical reasoning[8].

For study[6], the skills to be developed in the professional field, in this case, in nursing training, must above all include a set of knowledge, skills, attitudes and values, in a way that allows the professional to be the protagonist of their objective and subjective professional experiences.

In this assumption, the need to acquire knowledge is recognized, not only as a mere unidirectional transmission of content about CRP, but an exchange of experiences that take into account the nurse's prior knowledge in order to promote inspiring environments that support learning situations that allow the professional to move from their comfort zone to a situation of dependence and the need for knowledge about CRP as a prerequisite for acting as a professional in emergency and out-of-hospital emergencies[13,14].

Given this scenario, it was possible to see that studies pointed to permanent, continuing education and competency-based training as indispensable requirements for good nurse training mediated by health and educational institutions.

Nurse communication regarding out-of-hospital PCR

Communication between the team of professionals working in an out-of-hospital PCR is fundamental to the success of the assistance provided, however, studies have shown difficulties in communication between team members during cardiopulmonary resuscitation maneuvers, among the difficulties cited that not all nurses know the international phonetic code, as well as the “Q” code and “closed loop” communication[15,16].

For communication to be effective, it is necessary that all parties involved understand the message to be transmitted. Although it may seem like a simple concept, in practice it is often a difficult objective to achieve and can result in undesirable and even harmful consequences. Therefore, closed-loop communication can be fundamental for this objective to be achieved[16].

The international phonetic code as well as the Q code were developed in a military environment, specifically in wars where there was a need to communicate in a few words since time was scarce and the environment was hostile. However, the literature points out that closed-loop communication is an effective form of communication between nurses and team members, since the sender issues the command and the receiver repeats it, confirming the action, that is, it corroborates the certification of the message sent and therefore reducing possible communication errors that could affect the team's response time[11,16].

Nurse skills when dealing with out-of-hospital CPA

To effectively care for victims of out-of-hospital cardiac arrest, certain skills are necessary, such as early recognition of the situation, rapid activation of the system and prompt performance of Cardiopulmonary Resuscitation maneuvers[1].

In the present review, opportunities for improvement were identified during the assistance provided to victims of out-of-hospital CPA, such as: low skill in CPR maneuvers and difficulty in handling technologies[12,13].

Regarding the low skill of nurses in performing CPR maneuvers, the need to provide these professionals with learning situations that allow them to “do observables” repeatedly to “refine” the technique stands out[6,17,18].

Only the transmission of knowledge through expository and dialogued classes does not cover the development of these skills, such as handling multiparametric monitors, electrocardiogram devices, infusion pumps for administering medications, number of compressions and ventilations. necessary, depth of compressions and chest return, etc[1,6,18].

In the author's view[6], to develop competency-based teaching, it is necessary for education and health institutions, through permanent education services and realistic simulation environments, to bring nursing students and/or care nurses closer together, with a view to developing skills that promote safety, improving the quality of care and reducing the possibilities of iatrogenic acts.

Attitudes and values towards out-of-hospital CPA

Understanding nursing as a social practice means going beyond its technical-operative dimensions, resulting from the direct application of biotechnological knowledge, and seeing it as one of the many practices of society, with which it shares responsibility for health. Nursing, therefore, is seen as an integral part of the health production process, correlating with the social purpose of work and social institutions[7,11,14].

In this integrative review, the need for improvement in attitudes and values regarding extra-hospital CA was identified through studies. In professional practice, values constitute axes around which nurses' activities revolve, as they are constructions, the values can be understood through interpretative looks, gestures, attitudes that permeate ethical conduct[15-17].

In this sense, out-of-hospital PCR is carried out in a non-controllable and often hostile environment, so nurses are required to have an ethical stance with respect to the various out-of-hospital PCR cases attended to, a form of treatment with the population and their peers. in search of a harmonious, safe, and productive environment[4].

Final Considerations

Cardiovascular diseases occupy the first place in the mortality ranking in the world, among the main causes are out-of-hospital CPA with statistical relevance in the world and in Brazil.

The nurse is an essential professional in the pre-hospital urgency and emergency team, playing an extremely important role in the assistance provided to patients suffering from cardiac arrest.

However, despite the morbidity and mortality of out-of-hospital CPAs and the importance of the nurse as a member of the care team, the training of this professional still involves gaps that distance theory from practice, thus arising the need for new educational strategies that seek to integrate nurse training.

In this sense, we sought, through an integrative review of the literature, to identify the main skills necessary for nurses working in out-of-hospital CPA, to contribute to their training and therefore reflect on high-quality care practice. The competencies found were knowledge, communication, skills, attitudes, and values of nurses in the face of out-of-hospital CPA.

The search for articles published nationally was considered as a limitation of the study, however it is expected that the competencies identified in this study may awaken in professional nurses an interest in seeking the best practices in CPA care, in a way that contributes to improvement the quality of assistance provided to the population.

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