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REVIEW ARTICLE

# The importance of the risk classification and chest pain protocol in an emergency care unit

*La importancia de la clasificación de riesgo y protocolo de dolor torácico en una unidad de urgencias*

*A importância do protocolo de classificação de risco e dor torácica em unidade de pronto atendimento*

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**Abstract**

The aim was to understand and emphasize the importance of the risk classification and chest pain protocol in hospital institutions. This is an integrative literature review with descriptive analysis and a qualitative approach. carried out between August and September in the year 2022, with a search in the databases Medical Literature Analysis and Retrieval System Online, Latin American and Caribbean Literature in Health Sciences, Nursing Database and Scientific Electronic Library Online. For the search strategy, the following descriptors were used: Chest Pain, Emergency Room, Nursing, Emergency and their synonyms. Of the 132 articles found, 14 were selected to compose the sample. It was evidenced that risk classification and chest pain protocols are instruments that optimize patient care time, and in addition to guiding the team, offer autonomy to nurses and guarantee quality and effectiveness in care.

**Descriptors:** Chest Pain; Emergency Medical Services; Nursing; Emergencies; Review.

**Resumén**

El objetivo fue comprender y enfatizar la importancia de la clasificación de riesgo y el protocolo del dolor torácico en las instituciones hospitalarias. Se trata de una revisión integrativa de la literatura con análisis descriptivo y enfoque cualitativo. realizada entre agosto y septiembre del año 2022, con una búsqueda en las bases de datos Medical Literature Analysis and Retrieval System Online, Latin American and Caribbean Literature in Health Sciences, Nursing Database y Scientific Electronic Library Online. Para la estrategia de búsqueda se utilizaron los siguientes descriptores: Chest Pain, Emergency Room, Nursing, Emergency y sus sinónimos. De los 132 artículos encontrados, 14 fueron seleccionados para componer la muestra. Se evidenció que los protocolos de clasificación de riesgo y de dolor torácico son instrumentos que optimizan el tiempo de atención al paciente, y además de orientar al equipo, ofrecen autonomía a los enfermeros y garantizan calidad y eficacia en la atención.

**Descriptores:** Dolor em el Pecho; Servicios Médicos de Urgencia; Enfermería; Urgencias Médicas; Revisión.

**Resumo**

Objetivou-se compreender e enfatizar a importância do protocolo de classificação de risco e de dor torácica nas instituições hospitalares. Trata-se de uma revisão integrativa da literatura com análise descritiva e abordagem qualitativa. realizada entre agosto e setembro no ano de 2022, com busca nas bases de dados Medical Literature Analysis and Retrieval System Online, Literatura Latino-Americana e do Caribe em Ciências da Saúde, Base de Dados de Enfermagem e Scientific Electronic Library Online. Para a estratégia de busca foram utilizados os descritores: Dor Torácica, Pronto Socorro, Enfermagem, Emergência e seus sinônimos. Dos 132 artigos encontrados, 14 foram selecionados para compor a amostra. Evidenciou-se que os protocolos de classificação de risco e de dor torácica, são instrumentos que otimizam o tempo de atendimento ao paciente, e além de nortear a equipe, oferece autonomia ao enfermeiro e garante qualidade e efetividade na assistência.

**Descritores:** Dor no Peito; Serviços Médicos de Emergência; Enfermagem; Emergências; Revisão.

## Introduction

The risk classification protocol was designed to help the population in a humane way, identifying the levels of complexity of care. This triage is a model of the method used by American soldiers in the wars of the 20th century. In Brazil, the most used risk classification protocol is the Manchester Protocol, consisting of five colors in order to identify the level of care for each patient. In general they are: red, orange, yellow, green and blue[1].

This method brought a new concept to health care, as well as numerous benefits and is currently used in several health institutions, aiming to improve care, with efficiency, agility and reduction of care time in the most serious cases, in addition to improving processes in general. Its use is crucial in treating chest pain, especially in institutions that do not have a specific protocol for chest pain. Thus, its application can positively or negatively impact the outcome of cases related to this diagnosis[2].

The risk classification must be carried out by a professional qualified to attend entrance doors, identifying signs and symptoms, and knowing their severity[2].

Chest pain is one of the most frequent causes of seeking hospital care in emergency rooms, characterized by the feeling of pain or discomfort, which is located in the anterior region of the chest and corresponds to 5% of visits to emergency units[3].

Within the framework of chest pain, it is observed that the pain symptom may be related to coronary disease, diseases of the respiratory system or digestive system[4,5]. Faced with this patient, some questions are necessary, such as: the location of the pain, if it is a pain that radiates, its characteristic, time of onset, vulnerability factors and factors that improve or worsen the intensity of the pain[6]. Another important aspect of chest pain is to understand the possible extent of pain irradiation, which can go from the mandible to the navel, including the upper limbs and posterior region of the thorax[4,5].

Faced with the fragility of care for patients with chest pain, the need for a protocol was identified that would guide care for patients with this symptom, in addition to the Manchester classification[7].

The “Chest Pain Protocol” is an instrument that helps identify and treat patients with Acute Coronary Syndrome (ACS) and avoid unnecessary hospitalization or release for early discharge, and within this protocol there are risk stratification scales that help in taking of decision of the best therapeutic choice, therefore, it helps the nurse in the triage of the patient with chest pain. However, not all hospital institutions use this tool[7].

The protocol begins with the withdrawal of the service password by the patient, where the nurse applies the Risk Classification, classifies it as urgent, and then performs the electrocardiogram. The patient must be seen by the doctor within 10 minutes of arrival[7].

After medical care, a decision is made whether the patient will continue to be included in the protocol. If you choose to continue in the protocol, you must request the collection of a myocardial necrosis marker, classify the pain, and estimate the probability of acute coronary syndrome, and follow the institutional flow[7].

Considering the importance of chest pain and its different etiologies, it is necessary to use protocols that guide care, its understanding and correct application, in order to guarantee quality and effectiveness in care.

Therefore, the present study aimed to understand the importance of the risk classification and chest pain protocol in emergency care units.

## Methodology

This is an integrative literature review with descriptive analysis and a qualitative approach. This study went through 06 stages: (1) formulation of the research question and definition of the problem for the construction of the review, (2) choice of criteria for inclusion and exclusion of studies, (3) explanation of the information taken from the studies selected in the moment of information collection, (4) critical analysis of studies, reaching from the research, (5) comparison and interpretation of studies for discussion of results and (6) presentation of the review in a detailed and easy to understand way[8].

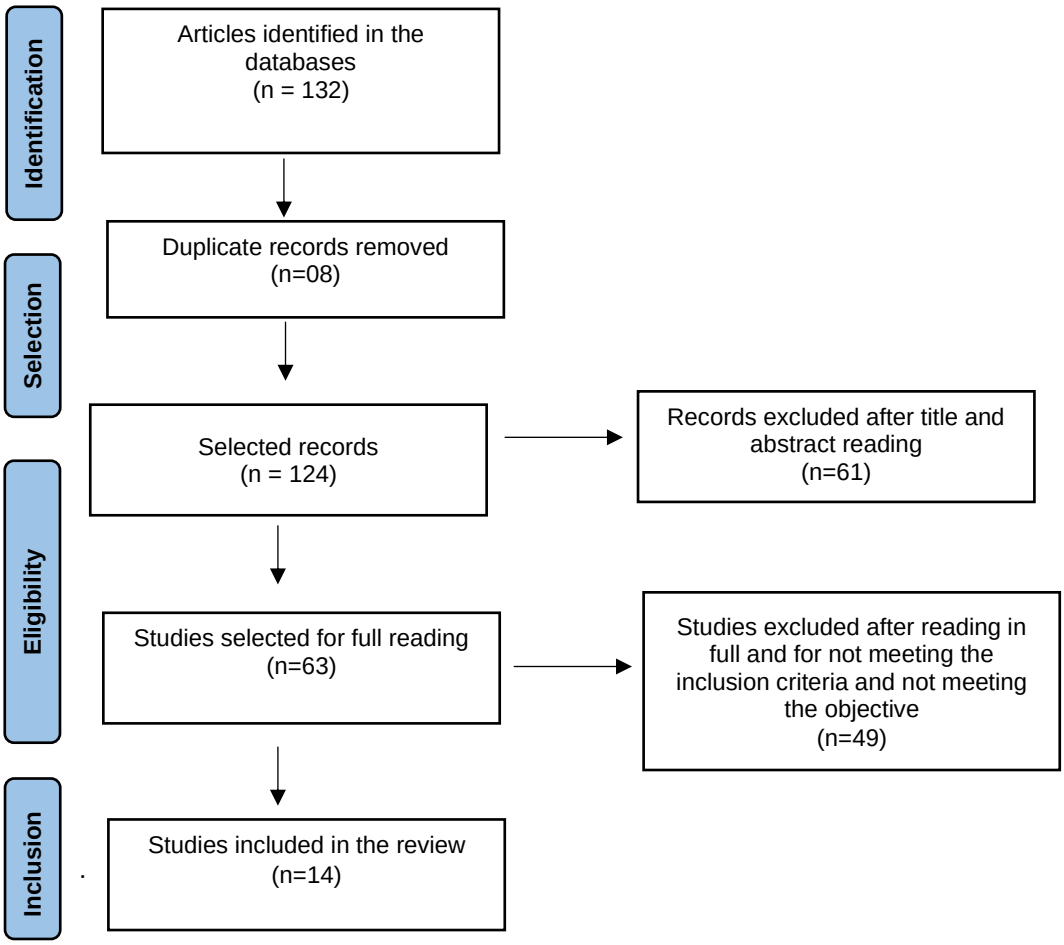
Faced with the fragility of care for patients with chest pain, the guiding question of this study was: What is the importance of the risk classification and chest pain protocol in hospital institutions?

Data collection took place in August and September 2022, using the following databases: Medical Literature Analysis and Retrieval System Online (MedLine), Latin American and Caribbean Literature in Health Sciences (LILACS), Database Nursing Data (BDEnf) and Scientific Electronic Library Online (SciELO). For data grouping, the following Health Science Descriptors (DeCS) Emergency, Thoracic Pain, Nursing and Emergency Room and their synonyms were used, being crossed with the Boolean operator “AND” and “OR”.

Primary studies published in Portuguese, English or Spanish, from January 2013 to August 2022 were included. Editorials, letters, reviews, theses and dissertations, duplicate articles and articles that did not address the theme of the review were excluded.

The articles were analyzed in order to identify the studies that met the selection criteria. After identifying the studies that met the inclusion criteria, the data were extracted and organized and then entered into a Microsoft Excel© spreadsheet. The extracted data were: author, year and country of publication, title, objective, methodology and main findings.

**Figure 1.** Flowchart of search and selection of studies according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)[9]. Campinas, SP, Brazil, 2022




## Results

With the descriptors used, 132 articles were identified. Eight articles were excluded due to duplicity and 61 after reading the title and abstract. Of the articles selected for reading in full, 75 studies were excluded for not meeting the selection criteria, resulting in the selection of 14 articles.

Chart 1 summarizes the studies analyzed in terms of author, year and country of publication, title, objective, methodology and main findings..

As for the place where the studies were carried out, 11 (78.57%) are from Brazil, one (7.14%) from Chile, one (7.14%) from Iran and one (7.14%) from the USA. As for the temporal chronological order, it was found that of the 14 articles selected, four (28.58%) were published in 2013, two (14.28%) in 2014, two (14.28%) in 2016, three (21.42%) in 2017, two (14.28%) in 2018 and one (7.14) in 2019.

Regarding the study designs, two (14.28%) exploratory studies, three (21.42%) descriptive studies, two (14.28%) qualitative studies, one (7.14%) retrospective observational study, three ( 21.42%) cross-sectional studies, one (7.14%) observational study, one (7.14%) multicenter perspective study, one (7.14%) retrospective study.

**Chart 1.** Description of selected articles according to author, year, country, title, objective, methodology and main findings. Campinas, SP, Brazil, 2022

| Author, Year and Country | Title | Objective | Methodology | Main Findings |
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| Alves, 2013[10]<br><br>Brazil | Atuação do enfermeiro no atendimento emergencial aos usuários acometidos de infarto agudo do miocárdio | Analyze the emergency assistance provided by nurses to users affected by Acute Myocardial Infarction (AMI). | Exploratory, descriptive and qualitative study | The research envisaged the need for improvement, adequacy of the welcoming physical structure of users with Acute Myocardial Infarction (AMI). Although some professionals have adequate knowledge, it is important to emphasize the qualification of human resources in order to minimize the consequences generated by the infarction. |

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| Santos, 2013[1]<br><br>Brazil | Desafios para a gerência do cuidado em emergência na perspectiva de enfermeiros | Analyze the challenges for managing care in an emergency hospital service, based on the perspective of nurses. | Qualitative, exploratory study | Such challenges and strategies represent an impetus for the development of new practices through collaborative work and articulation with the emergency care network. |
| Souza, 2013[11]<br><br>Brazil | Nurses' perception about risk classification in an emergency service | Know the perception of nurses about risk classification in the emergency service. | Qualitative, descriptive study | Risk classification offers an opportunity for professional autonomy insofar as it is the person primarily responsible for regulating care at the doors of emergency services. |
| Marcolino, 2013[12]<br><br>Brazil | Implantação da Linha de Cuidado do Infarto Agudo do Miocárdio no Município de Belo Horizonte | Evaluate the implementation of the AMI Care Line in Belo Horizonte, Minas Gerais, and its impact on hospital mortality due to AMI. | Retrospective observational study | The implementation of the AMI Care Line allowed greater access of the population to adequate treatment and, consequently, a reduction in hospital mortality due to AMI. |
| Abiuso, 2014[13]<br><br>Chile | Dolor torácico en el Servicio de Urgência | This article presents an approach focused on Emergency Medicine perspective in hopes of offering the clinician a strategy focused on ruling out life-threatening conditions first and then setting the patient's disposition efficiently and safely. | Descriptive study | Having a good doctor-patient-family relationship, listening to their concerns and reassessing the patient every time they show changes in their symptoms. only with a clinical and human approach of excellence, we will achieve that our patients are satisfied with our care. |
| Gomes, 2014[14]<br><br>Brazil | Dor torácica na admissão em uma emergência cardiológica de referência | Check the presentation of chest pain in a reference unit in cardiology emergency in Recife, PE. | Cross-sectional, descriptive study | The delay in reaching the reference unit impairs the diagnosis and the possibility of starting reperfusion therapy in pre-hospital care should be considered. |
| Vieira, 2016[15]<br><br>Brazil | Percepção dos enfermeiros de emergência na utilização de um protocolo para avaliação da dor torácica | Identify the perception of nurses in the emergency department of a hospital in southern Brazil on the use of a nursing protocol to classify chest pain, a protocol that has already been implemented in a private hospital located in the southeastern region of Brazil. | Qualitative, descriptive study | As negative considerations point out to be extensive and time-consuming. For nurses, the protocol is applicable to the service, as it provided support in their conduct. |
| Chianca, 2016[16]<br><br>Brazil | Tempos de espera para atendimento usando sistema de triagem de Manchester em um hospital de urgência | The Manchester Triage System (STM) is used in emergency services to determine the clinical priority of patients, optimizing the waiting time for medical care. | Descriptive study | The nurse is classifying the patient in the time recommended by the MTS. Most patients classified as orange and 41.8% of those classified as yellow waited for medical care longer than recommended by the MTS, indicating the need to establish care flows to minimize waiting times and adapt them to those recommended by the MTS. |
| Santos, 2017[17]<br><br>Brazil | Habilidade dos enfermeiros na interpretação do eletrocardiograma de 12 derivações | Evaluate the ability of nurses to recognize immediate intervention electrocardiographic alterations and compare their performance in the face of arrhythmias, according to the type of unit in which they work. | Cross-sectional study | Nurses are skilled enough to identify changes in heart rhythm. There was no difference in relation to performance, when compared to the type of unit. |
| Duro, 2017[18]<br><br>Brazil | Opinião de enfermeiros sobre classificação de risco em serviços de urgência | Evaluate the opinion of nurses about risk classification in emergency services. | Descriptive study | It was concluded that nurses strengthen their care practice in the risk classification of patients, however, it is necessary to develop strategies to overcome structural difficulties. |
| Marconato, 2017[19]<br><br>Brazil | Prioridades da classificação de risco em uma unidade de emergência e desfecho do atendimento | Associate the proposed priorities of the institutional risk classification protocol with care outcomes in the | Observational study | The risk classification protocol demonstrated good sensitivity for predicting serious situations that may progress to death or hospitalization. |

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| | | emergency unit and evaluate the care profile. | | |
| Davarani, 2018[20]<br><br>Iran | Do Patients with Chest Pain Benefit from Installing Triage System in Emergency Department? | Compare primary care delivery time for patients with chest pain before and after the application of the triage system in the ED. | Cross-sectional study | It is likely that patients with chest pain referred to the ER will benefit from the installation of the triage system regarding the performance of some nursing care, including performing an ECG, starting cardiac monitoring and inserting. |
| Pertesew, 2018[21]<br><br>Brazil | Gerenciamento do protocolo de dor torácica no setor de emergência | Evaluate the adherence of emergency physicians to the application of a chest pain protocol and the impact on the mortality rate due to acute myocardial infarction. | Retrospective study | The management of this protocol allows mapping the process, as well as checking effectiveness, strengths and weaknesses, and risks. |
| Mirzaei, 2019[22]<br><br>USA | The quality of symptoms in women and men presenting to the emergency department with suspected acute coronary syndrome | Describe the quality of symptoms (breast, description of discomfort/pain, location/radiation and general discomfort of symptoms) reported by women and men included and excluded for ACS in OS. | Multicenter perspective study | Higher levels of symptom distress can help emergency personnel make the decision to evaluate a patient for ACS, and the presence of chest pressure can help make a differential diagnosis of ACS. |

**Discussion**

With the significant increase in the demand for care in emergency units, it led to an increase in the demand for health care, within this scenario, there was a need to reformulate care strategies to organize the work process. The risk classification (CR), through the humaniza SUS program in 2004, was a strategy proposed by the Ministry of Health, with the purpose of strengthening the bond between health care professionals and users, providing care by degree of complexity and humanized health care . In several countries, this care model has proven to be effective and an important instrument for organizing emergency care sectors. The CR is a guide that determines care by degree of complexity that contributes to the quality of care and the reduction in morbidity and mortality rates. Risk classification does not confer a medical diagnosis through screening[11,16-19].

The CR is applied by the professional nurse, for this it is important that he is properly trained and qualified, knowing how to develop some skills if necessary, such as: having qualified listening, clinical knowledge, professional experience, strengthening effective communication between professionals and users, developing the ability to manage conflicts[18]. The study emphasizes the intuitive ability in line with professional experience, as these skills help in making difficult decisions, and clinical knowledge is also a skill developed by nurses, as it traces the care provided in the emergency service. Some obstacles portrayed the relevant impact on the process of implementing the CR, such as the scarce workforce of nurses, the deficiency of primary health care and the lack of knowledge of the population, are factors that corroborate with overcrowding, which makes the service time in the CR is increased[16-19].

The high demand for emergency room care presents statistical data that show the prevalence of care for patients with chest pain, which corresponds to 5 to 15% of care in emergency room units, and the number of deaths, which corresponds to 32% due to cardiovascular diseases, leading the statistical indices in Brazil[15].

The chest pain protocol is an instrument that aims to identify patients with Acute Coronary Syndrome (ACS), ensuring that the patient is not released early, as well as unnecessary hospitalizations, in addition to contributing to the medical care through the RC being carried out in 10 minutes, however, for there to be effectiveness in the application of the chest pain protocol, the care flow must be based on guidelines with proven scientific evidence[14-21].

Classifying patients with chest pain is challenging, as nurses need to understand the different etiologies of chest pain, which correspond to diseases of the respiratory system, digestive system and circulatory system, and the pain can radiate from the mandible, upper limbs and abdomen , have the knowledge and ability to recognize that chest pain may be related to (ACS) Acute Coronary Syndrome, including Acute Myocardial Infarction (AMI), early diagnosis and contribute to the reduction of mortality from (AMI)[14 -21].

Knowing how to identify the difference between precordial pain and other types of pain is one of the main skills required and to be developed by nurses in RA, considering that this factor was included as the fifth vital sign, measuring this symptom requires observation, qualified listening, and believe in the intensity of the pain complaint presented, for this the use of protocols and care flows become indispensable, according to the American Heart Association[14-21].

The quality of the symptoms presented by men and women with suspected (ACS), it is observed that the female public takes longer to seek care, potentiating greater complications and increasing the hospital mortality rate. Intense and prolonged precordial pain that radiates to the left shoulder, neck and jaw in men aged between 41 and 70 years, is indicative of (AMI), in women the pain radiates to the jaw, neck, throat, chest pressure, the latter mentioned symptom, was a predictor in the diagnosis of (ACS) in

women, and that in this public, pressure is a more serious symptom than pain[22].

The implementation of the chest pain protocol gives the nurse autonomy to perform the electrocardiogram (ECG) within 10 minutes of the patient's arrival, reducing the time for medical diagnosis, considered golden time for the beginning of adequate treatment[18]. Emphasizes in his study the importance of nurses knowing how to identify normality and abnormal patterns in the electrical tracing (ECG), thus contributing to immediate interventions and reducing the potential for lethal events to the patient, after the medical diagnosis, with the request for exams at hand , it is up to the nurse to direct his team to care, ensure multiparameter monitoring, as well as the provision of large-caliber peripheral venous access, collection of laboratory tests and offer oxygen to the patient[10,13-17].

The care protocols favor the organization of the service, organization of the work process of the multidisciplinary team, reduce the time of care, facilitate the identification of risk factors, grant autonomy to the nurse, define the next steps of the flow of care, enable the care humanized, contributes to patient safety, the implementation of care protocols, relies on the knowledge and commitment of the professional, so that it is applied correctly, however, in some services the use of care protocols is not enough to alleviate wear and tear caused by overcrowding, and the quality of care is compromised, some evidenced obstacles say it is possible to provide quality emergency care, however, the maintenance of basic care is unfeasible, patients occupying beds in the emergency room should have predestined hospitalization beds, as , the physical structure and service profile of the sector does not support this type of care, since the vision of this unit is to prioritize care for the most serious patients, this factor has negative impacts on the functioning of the sector, it also mentions the burden exhaustive working hours by professionals, precarious input and equipment resources, and the commitment to the quality of care provided and the updating of professional training by the absent permanent education[1,15].

Two studies brought experience in the implementation of care protocols. One of the articles analyzed in its study the implementation of the care line for patients with chest pain in Belo Horizonte, with the intention of facilitating access to health care for patients affected by this symptom. The process had an agreement between public health care services, organized training in all units that would be references for this type of care, provided access to hemodynamics laboratories[12].

The implementation of clinical protocols and flowcharts, were based on international guidelines and scientific evidence, which contemplates the teleelectrocardiogram through software integrated into the network, capable of forwarding the exam to cardiology centers for medical analysis. This method enables the transfer in less time of the patient affected by (ACS) with ST-segment elevation, thrombus lysis time, balloon door time, and approach to care in (AMI), and was developed with the participation of the multidisciplinary team, involved in the line of care[20].

The impacts after the implementation of this line of care were not found in the literature. In an article published in Iran, reports the implementation of the triage system in the emergency room, the method chosen was an international protocol, "Emergency Severity Index (ESI)", this method contemplates that all patients seeking care must be classified by the professional nurse or doctor within 3 minutes, and the classification is made according to vital signs and the patient's main complaint, the author reports that the classification is done in five stages and emphasizes that this method provides necessary resources for each user, it is easy to apply and easy to replicate for the team involved, the higher the score the lower the patient's degree of complexity[20].

The patient with chest pain contemplates level two of this scale, where care begins with the (ECG) of twelve leads in 10 minutes, the professional ensures the insertion of the intravenous device and monitoring with multiparameters. The author reports that before implementing the risk classification protocol, patients were treated on a first-come, first-served basis, preventing patients with a high degree of complexity from being treated in a timely manner, offering a risk of death. The study observed the impacts generated before the implantation and post-implantation of the protocol, where the time of arrival of the patient in the emergency room with chest pain and beginning of the interventions was measured, it was evidenced that the time of (ECG), the installation of intravenous device, and multiparameter monitoring, had significantly lower results after the implementation of the protocol, and the time of care by the physician remained[20].

As a limitation, we highlight the lack of recent studies that measure the impacts generated for the multidisciplinary team, and the quality of care in relation to the use of care protocols.

**Conclusion**

The study enabled the analysis and understanding of the importance of risk classification protocols and chest pain protocol, as well as the benefits that both present in the quality of care provided, organization of the service, reduction of waiting time, care by degree of complexity, decrease in morbidity and mortality rates and the obstacles encountered.

There was a need for more articles that measure the perception of nurses about the protocols, as these were considered in most studies as essential for the application of protocols and active participants in the clinical outcome of patients, however, the need to permanent training of these professionals, in the application of the risk classification protocol and chest pain protocol in urgent and emergency care, caused by chest pain.

Studies show that lack of physical structure, lack of equipment and inputs, lack of skilled labor, lack of agreement between health services, lack of education in health promotion by primary health care, are factors that negatively impact , causing overcrowding, consequently implying in the good performance of the risk classification.

In view of the above, there is a need for more work that demonstrates the implementation of care protocols, as well as the nurse's performance and perception in applying the protocols, since these were considered in most studies as essential for the application of the protocols , therefore, considered as active participants in the clinical outcome of patients and the need to carry out permanent training of these professionals, in the application of the risk classification protocol and chest pain protocol.

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