Journal of Nursing

Revista de Enfermagem

UFPE On Line

ISSN: 1981-8963

INTEGRATIVE REVIEW ARTICLE

SIGNS, SYMPTOMS AND COMPLICATIONS OF ACUTE MYOCARDIAL INFARCTION

SINAIS, SINTOMAS E COMPLICAÇÕES DO INFARTO AGUDO DO MIOCÁRDIO SIGNOS, SÍNTOMAS Y COMPLICACIONES DEL INFARTO AGUDO DEL MIOCADIO

Renata Soares Passinho¹, Walckiria Garcia Romero Sipolatti², Mirian Fioresi³, Cândida Caniçali Primo⁴

ABSTRACT

Objective: to analyze the scientific productions regarding the frequency of signs, symptoms and complications of acute myocardial infarction. **Method:** integrative review, with search publications between 2010 to 2014, in the databases LILACS, MEDLINE and CINAHL. The process of analysis of the 122 articles selected was based on the exploratory and critical reading of the titles, abstracts and results of the research, in which the AMI-related phenomena (signs, symptoms and complications) were searched. **Results:** chest pain (N = 75), heart failure (N = 52), dyspnea (N = 24) and arrhythmia (N = 20) were the most common signs and symptoms. **Conclusion:** chest pain is the most frequent symptom of the disease. The early recognition of these phenomena will contribute to the improvement of the prognosis of the affected person. **Descriptors:** Nursing Care; Nursing diagnosis; Acute Myocardial Infarction; Classification; Nurses and Nurses; Cardiology.

RESUMO

Objetivo: analisar as produções científicas a respeito da frequência dos sinais, sintomas e complicações do infarto agudo do miocárdio. **Método:** revisão integrativa, com busca publicações entre 2010 a 2014 nas bases de dados LILACS, MEDLINE e CINAHL. O processo de análise dos 122 artigos selecionados deu-se por meio da leitura exploratória e crítica dos títulos, resumos e dos resultados das pesquisas, onde se buscaram os fenômenos relacionados ao IAM (sinais, sintomas e complicações). **Resultados:** A dor no peito (N = 75), a insuficiência cardíaca (N = 52), a dispneia (N = 24) e a arritmia (N = 20) foram os sinais e sintomas mais encontrados. **Conclusão:** a dor no peito é o sintoma mais frequente da doença. O reconhecimento precoce desses fenômenos irá contribuir para a melhoria do prognóstico da pessoa acometida. **Descritores:** Cuidados de Enfermagem; Diagnóstico de Enfermagem; Infarto Agudo do Miocárdio; Classificação; Enfermeiras e Enfermeiros; Cardiologia.

RESUMEN

Objetivo: analizar las producciones científicas acerca de la frecuencia de los signos, síntomas y complicaciones del infarto agudo de miocardio. **Método:** revisión integrativa, con búsqueda publicaciones entre 2010 a 2014, en las bases de datos LILACS, MEDLINE y CINAHL. El proceso de análisis de los 122 artículos seleccionados se dio por medio de la lectura exploratoria y crítica de los títulos, resúmenes y de los resultados de las investigaciones, donde se buscaron los fenómenos relacionados al IAM (signos, síntomas y complicaciones). **Resultados:** el dolor en el pecho (N = 75), la insuficiencia cardíaca (N = 52), la disnea (N = 24) y la arritmia (N = 20) fueron los signos y síntomas más encontrados. **Conclusión:** el dolor en el pecho es el síntoma más frecuente de la enfermedad. El reconocimiento precoz de estos fenómenos contribuirá a la mejora del pronóstico de la persona acometida. **Descriptor:** Cuidados de Enfermería; Diagnóstico de Enfermería; Infarto Agudo de Miocardio; Clasificación; Enfermeras y Enfermeros; Cardiología.

¹Master, Postgraduate Program in Nursing, Federal University of Espírito Santo. Vitória (ES), Brazil. E-mail: renatapassinho@gmail.com
ORCID iD: <https://orcid.org/0000-0003-0605-1610>; ²PhD, Postgraduate Program in Nursing, Federal University of Espírito Santo / PPGENF / UFES. Vitória (ES), Brazil. E-mail: walckiriagr@uol.com.br ORCID iD: <https://orcid.org/0000-0002-1365-4797>; ³PhD, Postgraduate Program in Nursing, Federal University of Espírito Santo / PPGENF / UFES. Vitória (ES), Brazil. E-mail: mirianfioresi@hotmail.com ORCID iD: <https://orcid.org/0000-0002-8560-4385>; ⁴PhD, Postgraduate Program in Nursing, Federal University of Espírito Santo / PPGENF / UFES. Vitória (ES), Brazil. E-mail: candida.primo@ufes.br ORCID iD: <https://orcid.org/0000-0001-5141-2898>

INTRODUCTION

In Brazil, cardiovascular diseases have been the main cause of death since the 1960s, representing a relevant percentage of all hospitalizations in the country.¹ Acute myocardial infarction (AMI) was the leading cause of death throughout the country world, accounting for 8.76 million of all deaths by 2015.² According to the Department of Information Technology of the National Health System (DATASUS), in 2016, 107,409 hospitalizations and 12,215 deaths were recorded for AMI.³

The third universal definition of AMI, in terms of pathological features, is the death of cardiomyocytes due to prolonged ischemia.⁴ The most common symptom of AMI is thoracic discomfort, which is manifested in 75% to 80% of patients. patients, in the form of "burning, indigestion, weight, tightness, oppression, suffocation, pain or pressure", that can last for about 30 minutes and can be constant and disappear, or be relieved with eructation.⁵

According to the American Heart Association, among the main causes of cardiovascular disease are poor living habits and health behavior, especially for AMI and Stroke, which include: smoking / tobacco use, obesity, sedentary lifestyle, high fat and sodium diets, family history and genetics of heart disease, high levels of cholesterol and other blood lipids, systemic arterial hypertension, diabetes mellitus and metabolic syndrome.⁶

Given the relevance of the theme and the character of increasing morbidity and mortality in Brazil, this integrative review of the literature will contribute to the knowledge related to the early identification of the disease (both among health professionals, and in the population in general), subsidizing clinical Nursing practice.

OBJECTIVE

- To analyze the scientific productions regarding the frequency of signs, symptoms and complications of acute myocardial infarction.

METHOD

Integrative review made from six stages: identification of the theme and selection of the guiding questions of the research; establishment of criteria for inclusion and exclusion of studies; definition of the phenomena related to acute myocardial infarction to be extracted from the results of the original articles; evaluation of selected

articles in the integrative review; interpretation of results; presentation of the knowledge evidenced by the integrative review.⁷

The integrative literature review can be defined as a broad review method that includes experimental and non-experimental research, aiming at the best understanding about a phenomenon and allowing the summary of the state of knowledge about a specific subject, indicating, from that scientific gaps that need to be met with the execution of new research.⁷⁻⁸

The purpose of this review was to identify the terms related to the signs, symptoms and complications of AMI being guided by the following guiding questions: What are the antecedent signs and symptoms of AMI? What are the signs and symptoms related to AMI complications?

A search was performed between August 2015 and December 2015 in the Latin American and Caribbean Literature on Health Sciences (LILACS), Medical Literature Analysis and Retrieval System Online (MEDLINE) and Cumulative Index to Nursing & Allied Health Literature (CINAHL) with the descriptors: "Nursing care", "Nursing diagnosis", "classification" and "acute myocardial infarction", two to two in Portuguese, English and Spanish. The temporal cut used was the selection of scientific articles extracted from these databases between 2010 and 2014. The criteria for inclusion of the articles were: original articles, presenting, in their results, signs, symptoms or complications of AMI and have abstracts available in the databases. Exclusion criteria were: papers presented at congresses, dissertations, monographs, theses, letters to the editor, reflection studies, articles on other topics or on AMI, but that did not bring signs, symptoms or complications and articles without a summary available.

We found 1187 articles divided into the following databases: 51 articles in LILACS, 951 in MEDLINE and 185 in CINAHL. Of this total, 68 were excluded because they were without the abstract available. Thus, 1119 articles were selected for reading the abstracts. Of these, 33 were excluded because they were repeated, leaving 1086 articles remaining. Then, another 966 articles were also excluded because they did not meet the inclusion and exclusion criteria. Finally, 122 articles were included in this integrative review (ten with qualitative design and 112 with quantitative) (Figure 1).

Figure 1. PRISMA flowchart of the search process and selection of studies included in the integrative review. Vitória (ES), Brazil, 2015.

The researches were carried out, independently, by two researchers (the main author of the study and its counselor). The selection of the studies was made from the analysis of the titles, abstracts and full texts of the publications. It is worth mentioning that, in situations of divergence, they were resolved through consensus. The articles included in the review that were not initially available in the databases were obtained in the full text format on the Coordination of Improvement of Higher Education Personnel Portal (CAPES).

The organization of the data was made from the elaboration of a structured instrument containing the database; the name of the magazine; the type of study; the study sample; the country in which it was carried out; and the level of evidence. The process of analysis of the 122 articles selected was based on the exploratory and critical reading of the titles, abstracts and results of the research, in which the AMI-related phenomena (signs, symptoms and complications) were searched.

Regarding the evidence of the studies, they were classified, considering the hierarchy of evidence for intervention studies,⁹ in: Level I

- systematic review or meta-analysis; Level II - controlled and randomized studies; Level III - controlled studies without randomization; Level IV - case-control or cohort studies; Level V - systematic review of qualitative or descriptive studies; Level VI - qualitative or descriptive studies and Level VII - opinions or consensuses.

When considering the analysis of the original articles and excluding the integrative or systematic reviews of the literature, as well as articles of expert opinions, as mentioned in the inclusion and exclusion criteria, only articles with levels of evidence II, III, IV I heard.

RESULTS AND DISCUSSION

Most articles were found in the MEDLINE database, with 104 articles (85.24%), followed by CINAHL and LILACS, with nine articles and eight articles, respectively (7.37%, 6.55%). Of this total of 122 articles selected, only 13 were conducted in Brazil, 26 studies were conducted in the United States and the rest in several European, Asian and South American countries, as shown in figure 2.¹⁰⁻¹³¹

Data Base		Journal		Country	Level of evidence
E1 ¹⁰	MEDLINE	JAMDA		Germany	IV
E2 ¹¹	MEDLINE	RMMG		Brazil	IV
E3 ¹²	MEDLINE	SMW		Switzerland	VI
E4 ¹³	MEDLINE	JC		Japan	VI
E5 ¹⁴	MEDLINE	ARYA Atheroscler		Iran	VI
E6 ¹⁵	MEDLINE	General Psychiatry	Hospital	4 northern countries of the Netherlands	IV
E7 ¹⁶	MEDLINE	Arch Cardiovasc Dis		Multinational (37 countries)	II
E8 ¹⁷	MEDLINE	Am. J. Med		Denmark	IV
E9 ¹⁸	MEDLINE	Eur Heart J Suppl		United Kingdom	IV
E10 ¹⁹	MEDLINE	J Am Soc Echocardiogr		Netherlands	VI
E11 ²⁰	MEDLINE	Heart		Serbia	VI
E12 ²¹	MEDLINE	J Zhejiang Univ Sci B		China	VI
E13 ²²	MEDLINE	AMIA Annu Symp Proc.		U.S	VI
E14 ²³	MEDLINE	J Magn Reson Imaging		Paris	IV
E15 ²⁴	MEDLINE	Eur Heart J Suppl		United States, Belgium and Poland	IV
E16 ²⁵	MEDLINE	Med J Aust		Australia and New Zealand	VI
E17 ²⁶	MEDLINE	Radiology		Spain	IV
E18 ²⁷	MEDLINE	Clin. Cardiol.		Taiwan	IV
E19 ²⁸	MEDLINE	Psychosom Med		Belgium	IV
E20 ²⁹	MEDLINE	J. Am. Coll. Cardiol.		U.S	VI
E21 ³⁰	MEDLINE	Theor Biol Med Mode		Will	VI
E22 ³¹	MEDLINE	Circ Cardiovasc Qual Outcomes		U.S	VI
E23 ³²	MEDLINE	BMJ Open		United Kingdom	VI
E24 ³³	MEDLINE	Circulation		U.S	VI
E25 ³⁴	MEDLINE	Psychosom Med		Netherlands	II
E26 ³⁵	MEDLINE	JACC: cardiovasc interv		United Kingdom	VI
E27 ³⁶	MEDLINE	Wiley Periodicals		U.S	IV
E28 ³⁷	MEDLINE	Am. J. Med.		Denmark	IV
E29 ³⁸	MEDLINE	BMJ Open		Italy, the Netherlands and Denmark	VI
E30 ³⁹	MEDLINE	J Invasive Cardiol		U.S	IV
E31 ⁴⁰	MEDLINE	Eur Heart J Suppl		United Kingdom, Belgium and Poland	IV
E32 ⁴¹	MEDLINE	J. Clin. Lab. Anal.		Turkey	IV
E33 ⁴²	MEDLINE	Circulation		U.S	IV
E34 ⁴³	MEDLINE	Crit Pathw Cardiol		U.S	IV
E35 ⁴⁴	MEDLINE	Circ. J.		Taiwan	IV
E36 ⁴⁵	MEDLINE	Int Urol Nephrol		Israel	VI
E37 ⁴⁶	MEDLINE	Am J Emerg Med		Spain	IV
E38 ⁴⁷	MEDLINE	J Am Heart Assoc		Australia	VI
E39 ⁴⁸	MEDLINE	Eur J Prev Cardiol		Norway	IV
E40 ⁴⁹	MEDLINE	AJC online		U.S	VI
E41 ⁵⁰	MEDLINE	AJC online		Italy	VI
E42 ⁵¹	MEDLINE	Am. Heart J.		Italy	IV
E43 ⁵²	MEDLINE	Kardiol Pol		Germany	IV
E44 ⁵³	MEDLINE	Coron. Artery Dis.		Turkey	VI
E45 ⁵⁴	MEDLINE	Emerg Med J		Australia	IV
E46 ⁵⁵	MEDLINE	Jecg Online		Germany	VI
E47 ⁵⁶	MEDLINE	BMC Res. Notes		Qatar	VI
E48 ⁵⁷	MEDLINE	Am. J. Med		Switzerland	VI
E49 ⁵⁸	MEDLINE	Eur Heart J Cardiovasc Imaging		Italy	IV

E50 ⁵⁹	MEDLINE	Cardiovasc J Afr.	Czech Republic and Bulgaria	IV
E51 ⁶⁰	MEDLINE	Acad Emerg Med	U.S	IV
E52 ⁶¹	MEDLINE	Circ Cardiovasc Qual Outcomes	U.S	VI
E53 ⁶²	MEDLINE	Chin. Med. J.	China	II
E54 ⁶³	MEDLINE	AJC online	U.S	IV
E55 ⁶⁴	MEDLINE	Emerg Med Australas	Australia	IV
E56 ⁶⁵	MEDLINE	Acad Emerg Med	U.S	IV
E57 ⁶⁶	MEDLINE	Acad Emerg Med	France	VI
E58 ⁶⁷	MEDLINE	Clin. Cardiol.	Spain	VI
E59 ⁶⁸	MEDLINE	J Cardiovasc Nurs	U.S	VI
E60 ⁶⁹	MEDLINE	Cardiology	Israel	VI
E61 ⁷⁰	MEDLINE	AJC online	U.S	VI
E62 ⁷¹	MEDLINE	Kardiol Pol	Turkey	VI
E63 ⁷²	MEDLINE	J Public Health	United Kingdom	IV
E64 ⁷³	MEDLINE	Atherosclerosis	Brazil	VI
E65 ⁷⁴	MEDLINE	Acta Med Iran	Will	VI
E66 ⁷⁵	MEDLINE	J Pak Med Assoc	Pakistan	VI
E67 ⁷⁶	MEDLINE	Clin. Sci.	England	IV
E68 ⁷⁷	MEDLINE	J Cardiopulm Rehabil Prev.	U.S	VI
E69 ⁷⁸	MEDLINE	Clin. Cardiol	Germany	VI
E70 ⁷⁹	MEDLINE	Clin. Chem.	Switzerland	VI
E71 ⁸⁰	MEDLINE	Eur J Clin Invest	Spain	IV
E72 ⁸¹	MEDLINE	Eur Heart J Suppl	Denmark	II
E73 ⁸²	MEDLINE	Rev. salud pública	Colombia	IV
E74 ⁸³	MEDLINE	PLoS One	Belgium	IV
E75 ⁸⁴	MEDLINE	Kardiol Pol	Poland	VI
E76 ⁸⁵	MEDLINE	Am J Emerg Med	Bahrain, Kuwait, Qatar, Oman, United Arab Emirates and Yemen	IV
E77 ⁸⁶	MEDLINE	Chin Med	China	II
E78 ⁸⁷	MEDLINE	Clin Med Insights Cardiol	Will	VI
E79 ⁸⁸	MEDLINE	J Med Dent Sci	Japan	VI
E80 ⁸⁹	MEDLINE	Eur J Echocardiogr	Japan	VI
E81 ⁹⁰	MEDLINE	Acad Emerg Med	U.S	IV
E82 ⁹¹	MEDLINE	Clin. Cardiol	Italy	VI
E83 ⁹²	MEDLINE	J Electrocardiol.	U.S	II
E84 ⁹³	MEDLINE	Br J Psychiatry Suppl	U.S	IV
E85 ⁹⁴	MEDLINE	Psychol Med	Netherlands	VI
E86 ⁹⁵	MEDLINE	Circ. J.	Korea	VI
E87 ⁹⁶	MEDLINE	J Adv Nurs	Australia	IV
E88 ⁹⁷	MEDLINE	Open Nurs J	Switzerland	VI
E89 ⁹⁸	MEDLINE	Nurs Res Pract	Finland	VI
E90 ⁹⁹	MEDLINE	J Clin Nurs	Sweden	VI
E91 ¹⁰⁰	MEDLINE	RGE	Brazil	VI
E92 ¹⁰¹	MEDLINE	Qual Health Res	Sweden	VI
E93 ¹⁰²	MEDLINE	ESC	Sweden	VI
E94 ¹⁰³	MEDLINE	Scand J Caring Sci	Sweden	VI
E95 ¹⁰⁴	MEDLINE	Nurs Res	Canada	II
E96 ¹⁰⁵	MEDLINE	J Invasive Cardiol	China	II
E97 ¹⁰⁶	MEDLINE	HSR: Health Serv Res	U.S	VI
E98 ¹⁰⁷	MEDLINE	Br J Nurs	United Kingdom	VI
E99 ¹⁰⁸	MEDLINE	JMI	Japan	VI
E100 ¹⁰⁹	MEDLINE	Int J Qualitative Stud Health Well-being	Sweden	VI
E101 ¹¹⁰	MEDLINE	Esc Anna Nery	Brazil	VI
E102 ¹¹¹	MEDLINE	Rev. Latino-Am. Enfermagem	Brazil	VI
E103 ¹¹²	MEDLINE	Rev Esc Enferm USP	Brazil	VI
E104 ¹¹³	MEDLINE	J Adv Nurs	Greece	VI
E105 ¹¹⁴	MEDLINE	Issues Ment Health Nurs	U.S	VI
E106 ¹¹⁵	LILACS	Rev Bras Cardiol	Brazil	VI

E107 ¹¹⁶	LILACS	Acta Paul Enferm	Brazil	VI
E108 ¹¹⁷	LILACS	Esc Anna Nery	Brazil	VI
E109 ¹¹⁸	LILACS	Texto Contexto Enferm	Brazil	VI
E110 ¹¹⁹	LILACS	Rev enferm UERJ	Brazil	VI
E111 ¹²⁰	LILACS	R. Enferm. Cent. O. Min	Brazil	VI
E112 ¹²¹	LILACS	Rev. Enfermeria	Cuba	VI
E113 ¹²²	LILACS	Rev Assoc Med Bras	Brazil	VI
E114 ¹²³	CINAHL	Res Nurs Health	U.S	IV
E115 ¹²⁴	CINAHL	J Cardiovasc Nurs	U.S	VI
E116 ¹²⁵	CINAHL	Prehosp Emerg Care	Australia	VI
E117 ¹²⁶	CINAHL	Am J Crit Care	U.S	VI
E118 ¹²⁷	CINAHL	Crit Care Med	Belgium	II
E119 ¹²⁸	CINAHL	Aust Health Rev	Australia	VI
E120 ¹²⁹	CINAHL	J Cardiovasc Nurs	U.S	IV
E121 ¹³⁰	CINAHL	Int Emerg Nurs	Australia	VI
E122 ¹³¹	CINAHL	CJE/M	Canada	IV

Figure 2. Distribution of the scientific production regarding the signs, symptoms and complications of AMI in the databases (2010-2014). *And study. Vitória (ES), Brazil, 2015.

Concerning the level of evidence of the selected articles, only nine presented level II (controlled and randomized studies), in which an experiment was performed with individuals previously randomized to a treatment group or a control group.⁹

Levels of evidence IV (observational case-control or cohort studies) and VI (qualitative or descriptive studies) prevailed, being found in, respectively, 41 and 72 studies.

Despite the large number of articles selected in the databases on AMI, only 21 were published in Nursing journals.

After reading the articles, the signs and symptoms and similar complications in the clinical manifestations were grouped and, as regards the frequency of appearance in the articles, the most found were (Figure 3).

Signs, symptoms and complications of AMI	N
Pain / discomfort chest / chest / angina / angina / rest / effort / retrosternal / type tightness or pressure / stitching / burning / laceration / weight	75
Congestive heart failure (CHF) / Chronic heart failure / Signs and symptoms associated with complicated HF: Pulmonary eardrums; Presence of third heart heart; (moderate or severe heart failure, pulmonary rales, presence of third heart, tachycardia, acute lung edema, and cardiogenic shock), and pulmonary edema / pulmonary congestion / systolic ventricular dysfunction / acute pulmonary edema / / Reinfarction / Left ventricular remodeling / Myocardial revascularization / Decreased cardiac output / Decreased ventricular ejection fraction / Cardiomegaly / Mechanical complications / Septal defects / Cardiogenic shock / hemodynamic instability	52
Dyspnoea / hyperventilation / Respiratory insufficiency	24
Arrhythmia / Conduction Disorders (others) / Atrioventricular block / bradyarrhythmia / Tachyarrhythmia / Supraventricular tachycardia / Ventricular tachycardia / Atrial fibrillation / Ventricular fibrillation / Palpitation	20
Irradiation of myocardial ischemic pain: Headache / Abdominal / epigastric pain / Arm discomfort / Hand numbness / Jaw pain / maxillary discomfort / teeth / Back pain / Neck pain	18
Fatigue	12
Anxiety / Affliction / Negative affectivity / Adapting to the new reality / Hopelessness / Despair / Feeling of physical or mental pressure / Feelings of shame and guilt / Sadness	11
Anxiety / Anxiety Disorder	9
Cardiorespiratory / cardiac arrest	8
Syncope / Fall / Dizziness / Tremor / Disturbed sensory perception	8
Sweating / diaphoresis	7
Fear / fear of death	6
Nausea	6
Physical discomfort / malaise	5
Heartburn / Eructation / Loss of appetite	4
Confusion / Mental Confusion	4
Vomiting	4
Weakness	3
Impaired urination / Hyperuricemia	2
Sexual dysfunction	1
Insomnia	1
Lethargy	1
Disturbed sensory perception	1
Ineffective tissue perfusion	1
Heat sensation	1

Figure 3. Absolute frequency of signs, symptoms and complications of AMI found in the integrative review of the literature and grouped according to their clinical similarities. Vitória (ES), Brazil, 2015.

Chest pain was the most frequent symptom in the articles of this review (75 times). It was also termed chest pain, precordial pain or precordialgia. Described as tight, oppressive, with irradiation to the upper limbs, mandible, dorsum or epigastrium, being accompanied or not by dyspnoea (24 times), cold sweating (seven times), nausea (six times) and vomiting (four times)). Such pain is of ischemic origin and is characterized by the sign of Levine (the patient places his hand flat on the center of the precordium). The common discomfort in pain is retrosternal and diffuse. Although it is impossible to characterize the myocardial wall affected by tissue ischemia solely by the location of the pain and its irradiation, there has already been an association between epigastric pain and infarction in the myocardial inferior wall.¹³²

Patients presenting with atypical chest discomfort that are similar to the causes of musculoskeletal, postural or pleuritic origin

are usually the elderly, diabetics, and women. Diabetics may exhibit the following atypical signs and symptoms: generalized weakness, syncope, dizziness or altered level of consciousness. Some women who have acute coronary syndrome describe a vague chest discomfort that may go away. In addition, they frequently manifest dyspnoea, weakness, unusual fatigue, cold sweating, dizziness, nausea and vomiting, and are twice as likely to die and reinfart in the first few weeks after AMI compared to men. However, not all individuals will present chest pain, such as, some diabetics (due to sensory and autonomic neuropathy), some women and the elderly.⁵

In-hospital mortality due to cardiovascular diseases is higher among patients with known type II diabetes mellitus and with worse glycemic control.¹³³

Heart failure is one of the most frequent complications after AMI, evidenced 52 times in this review. In relation to the onset of heart

failure and the functional severity of AMI, it is worth mentioning the elaboration of the clinical classification of Thomas Killip III and John T. Kimball, which was first published in 1967 with the purpose of describing the results of the treatment of 250 patients with AMI admitted to a coronary unit at a university hospital in the United States. It was presented based on clinical evidence of heart failure and cardiogenic shock. Thus, functional severity was related to the morbidity and mortality of AMI being classified as: Killip I - no signs of cardiac decompensation; Killip II - with pulmonary crackles, presence of third heart and elevated jugular venous pressure; Killip III - with acute pulmonary edema; and Killip IV - with cardiogenic shock or hypotension and peripheral vasoconstriction.¹³⁴⁻⁵

Dyspnea was found in 24 articles of this review and means "shortness of breath." It is a subjective sensation of respiratory discomfort, consisting of qualitatively distinct sensations and varying in intensity. It can be perceived in different ways, such as tightness in the chest, suffocation, shortness of breath or inability to fill the air lung. It is classified as mild, moderate, moderately intense or intense and is considered an anginal equivalent with regard to the manifestations of myocardial ischemia.¹³⁶⁻⁸

One of the causes of dyspnea in AMI is left ventricular dysfunction, which may be evidenced due to the presence of pulmonary crepitations (or rales), more common in dependent lobes (right and left lung bases). Pulmonary crepitation is caused by sudden reinflation of groups of alveoli and increased fluid in small airways. Sound is like "cellophane crushing" and are more heard during the end of inspiration.¹³⁹⁻¹⁴⁰

Arrhythmic manifestations (including tachycardia and bradycardia) are also anginal equivalents of myocardial ischemia and were evidenced 20 times in this review. Bradycardia may occur due to decreased heart rate during ischemia (resulting from hyperactivity of the parasympathetic nervous system) or its drug treatment. It may occur during the management of myocardial ischemia pain with opioid medications or during the prevention of arrhythmias with the use of beta-blockers. Sinus bradycardia may occur in lower-wall infarcts, vagal reflexes or even ischemia of the sinus node. It occurs in the form of symptoms of low cardiac output such as syncope or pre-syncope, dizziness, empty headache, weakness, fatigue, decreased level of consciousness, shortness of breath and chest discomfort or pain, in addition to sweating, congestion pulmonary, orthostatic

and arterial hypotension, evident heart failure or pulmonary edema, and ventricular tachycardia or frequent premature ventricular complexes related to bradycardia. Tachycardia usually accompanies chest pain and is caused by hyperactivity of the sympathetic nervous system (as well as sweating and hypertension).^{132,139,141}

Signs and symptoms arising from the irradiation of myocardial ischemic pain were found 18 times in this review. Chest discomfort in AMI can radiate to the neck, jaw, teeth, arms, shoulders and in the epigastric region. This reflects the common origin of sensory neurons supplying the heart and these areas from the posterior horn of the spinal cord.¹⁴⁰

In a study carried out with a population of 255 elderly Frenchmen diagnosed with AMI and aged 75 years or older, it was identified that the digestive symptoms, as an atypical presentation of the disease, were present in 9.8% of the sample.¹⁴²

Esophageal pain, caused by acid reflux in the stomach, spasm, obstruction, or injury in general is difficult to differentiate from the ischemic chest pain of acute coronary syndrome because the heart shares efferent vagal innervations with the esophagus. In addition, esophageal or abdominal pain may also be related to lower-wall AMI during right ventricular infarction, which is an anginal equivalent of myocardial ischemia.^{140,131}

Radiating pain in the jaw / teeth / jaw, observed in people affected by AMI, occurs due to the visceral nociceptive cardiac distribution through the convergence with the trigeminal nerve afferents in the cephalic segment, stimulating the second order trigeminal neurons that also carry sensorial information from the teeth. Therefore, heart pain can be interpreted as tooth or face pain. Characterized as strong to strong and palpation of masticatory muscles does not alter pain (differential diagnosis for pain due to temporomandibular dysfunction).¹⁴³

Nausea (six times in the review) and vomiting (four times in the review), are manifested as atypical signs and symptoms of myocardial ischemia, and occur due to reflex stimulation of the center of vomiting due to pain or due to vasovagal reflexes initiated in the infarcted myocardial area.¹³⁹

AMI is a condition that interferes in the musculoskeletal system and its associated pathways and compromises an individual's ability to mobilize properly, especially as a result of the signs, symptoms and complications associated with this disease.¹⁴³

Fatigue (12 times in review) is conceptualized as a negative emotion. They are feelings of decreased strength and endurance, exhaustion, mental or physical fatigue; lassitude with diminished aptitude for physical or mental work.¹³⁶

Weakness (four times in review) is an attribute of fatigue and is conceptualized as synonymous with asthenia (weakness, organic weakness).¹⁴⁵ Weakness, weakness, tremor, and activity intolerance are non-specific symptoms of AMI and evidence the reduction in the pumping capacity of the patient heart.¹⁴⁰

A secondary analysis study of 1270 women with AMI in the United States showed that 48.6% of those in the group classified as having "mild" symptoms presented extreme fatigue and one unusual fatigue.¹²⁹

In a phenomenological study in Sweden, with respect to the experience of 17 adults under 55 years of age who had AMI, it was evident that, after survival, there was an intense physical and mental fatigue related to the difficulty of performing the activities they did previously. In addition, the study showed that, in the face of an AMI, regardless of the age at which it occurs, there is a serious danger related to the patient's daily life, leaving him in an uncertain and vulnerable daily situation.¹⁰¹

In addition to clinical repercussions, AMI has significant changes in quality of life after the occurrence of the acute event. The impairment of the quality of life of these patients is mainly due to limitations in the performance of daily activities. A study conducted in 2012 evaluated the incidence of loss of independence and the decline in physical function after one year of hospitalization in 2002 in patients who underwent AMI in the United States to identify patients vulnerable to declining health status after illness. 43% of the patients studied experienced a decline in their health status; 12.8% lost their independence; 15.2% had physical function decline; and 15% presented a decline in the latter two, concomitantly.¹⁴⁶

In a population-based cohort study, conducted in 2014 with participants who had functional and cognitive limitations after hospitalization for stroke (n = 432) and AMI (n = 450), it was evidenced that most hospital admissions for these diseases were associated with significant increases in patients' functional disability at the time of the event and in the subsequent decade. Functional disability assessed included activities of daily living - ADL (walking, dressing, bathing, eating and going from bed to the bathroom) and

instrumental activities of daily living - AIVD (preparing a hot meal, doing shopping at the grocery store, making phone calls, ingesting drugs, and managing one's own money).

The signs, symptoms and complications of AMI found in this integrative review are important for the early identification of the disease, and will thus contribute to reduce the risks of morbidity and mortality in the adult population. Other signs and symptoms and complications were also found in this study, but, less frequently.

As a limitation of the research, it is possible to point out the non-inclusion of articles written in languages other than Portuguese, Spanish and English.

CONCLUSION

The analysis of the frequency of signs, symptoms and complications of AMI showed that the early recognition of these phenomena in the person affected by the disease, especially chest pain and its ischemic equivalents, will improve the prognosis of the individual with this morbidity.

The results found in this integrative review will contribute to the anticipation of the complications of AMI, both during admission, and in the clinical or mechanical treatment of the disease, providing, nurses, with scientific subsidies to provide quality care based on the integrality and reduction of the sequelae of the disease. morbidity and mortality, through an evidence-based practice.

REFERENCES

1. Ribeiro AL, Duncan BB, Brant LC, Lotufo PA, Mill JG, Barreto SM. Cardiovascular health in Brazil: trends and perspectives. *Circulation*. 2016 Jan;133(4):422-33. Doi: [10.1161/CIRCULATIONAHA.114.008727](https://doi.org/10.1161/CIRCULATIONAHA.114.008727)
2. World Health Organization. Media Centre. The top 10 causes of death [Internet]. 2017 Jan [cited 2017 Mar 10]. Available from: <http://www.who.int/mediacentre/factsheets/fs310>
3. Ministério da Saúde (BR). DATASUS. Informações de Saúde. Morbidade Hospitalar do SUS - Por local de internação. - Brasil [Internet]. Brasília: Ministério da Saúde; 2016 [cited 2017 Mar 15]. Available from: <http://tabnet.datasus.gov.br/cgi/tabcgi.exe?sih/cnv/niuf.def>
4. Thygesen K, Alpert JS, Jaffe AS, Simoons ML, Chaitman BR, White HD. Terceira definição universal de enfarte do miocárdio. *Rev Port Cardiol*. 2013;32(7-8):643.e1-643.e16. Doi: [doi:10.1093/eurheartj/ehr184](https://doi.org/10.1093/eurheartj/ehr184)

5. Aehlert B. Advanced Cardiac Life Support. Emergências em cardiologia: suporte avançado de vida em cardiologia: um guia para estudo. 4th ed. Rio de Janeiro: Elsevier; 2013.
6. Mozaffarian D, Benjamin EJ, Go AS, Arnett DK, Blaha MJ, Cushman M, et al. Heart disease and stroke statistics - 2015 update a report from the American Heart Association. *Circulation*. 2015 Jan;131(4):e29-322. Doi: [10.1161/CIR.000000000000152](https://doi.org/10.1161/CIR.000000000000152)
7. Mendes KDS, Silveira RCCP, Galvão CM. Integrative literature review: a research method to incorporate evidence in health care and nursing. *Texto contexto-enferm*. 2008 Oct/Dec;17(4):758-64. Available from: Doi: <http://dx.doi.org/10.1590/S0104-07072008000400018>
8. Almeida MA, Lucena AF, Franzen E, Laurent MC. Processo de enfermagem na prática clínica. Porto Alegre: Artmed; 2011.
9. Melnyk BM, Fineoct-Overholt E. Making the case for evidence-based practice. In: Melnyk BM, Fineoct - Overholt E, editors. Evidence-based practice in nursing and healthcare: a guide to best practice. Philadelphia: Lippincott Williams and Wilkins; 2005. p. 3-24.
10. Bahrman P, Christ M, Bahrman A, Rittger H, Heppner HJ, Achenbach S, et al. A 3-hour diagnostic algorithm for non-ST-elevation myocardial infarction using high-sensitivity cardiac troponin T in unselected older patients presenting to the emergency department. *J Am Med Dir Assoc*. 2013 June ;14(6):409-16. Doi: [10.1016/j.jamda.2012.12.005](https://doi.org/10.1016/j.jamda.2012.12.005)
11. Marino BCA, Nascimento GA, Rabelo W, Marino MA, Marino RL. Myocardial infarction without ST segment elevation: clinical and angiographic characteristics, and evolution of inpatients. *Rev Med Minas Gerais [Internet]*. 2012 Mar [cited 2015 Aug 20];22(1):1-128. Available from: <http://www.rmmg.org/artigo/detalhes/126>.
12. Witassek F, Schwenkglenks M, Erne P, Radovanovic D. Impact of body mass index on mortality in Swiss hospital patients with ST-elevation myocardial infarction: does an obesity paradox exist?. *Swiss Med Wkly*. 2014 Aug;144:w13986. Doi: [10.4414/smw.2014.13986](https://doi.org/10.4414/smw.2014.13986)
13. Fujii T, Masuda N, Suzuki T, Trii S, Murakami T, Nakano M, et al. Impact of transport pathways on the time from symptom onset of ST-segment elevation myocardial infarction to door of coronary intervention facility. *J Cardiol*. 2014 July;64(1):11-8. Doi: [10.1016/j.jjcc.2013.11.008](https://doi.org/10.1016/j.jjcc.2013.11.008)
14. Mohammadian-Hafshejani A, Sarrafzadegan N, Hosseini S, Baradaran HR, Roohafza H, et al. Seasonal pattern in admissions and mortality from acute myocardial infarction in elderly patients in Isfahan, Iran. *ARYA Atheroscler*. 2014 Jan;10(1):46-54. PMID: 24963314
15. Jonge P, Zuidersma M, Bültmann U. The presence of a depressive episode predicts lower return to work rate after myocardial infarction. *Gen Hosp Psychiatry*. 2014 July/Aug;36(4):363-7. Doi: [10.1016/j.genhosppsych.2014.03.006](https://doi.org/10.1016/j.genhosppsych.2014.03.006)
16. Carillo S, Zhang Y, Fay R, Angioi M, Vincent J, Sutradhor SC, et al. Heart failure with systolic dysfunction complicating acute myocardial infarction – differential outcomes but similar eplerenone efficacy by ST-segment or non-ST-segment elevation: a post hoc substudy of the EPHEsus trial. *Arch Cardiovasc Dis*. 2014 Mar;107(3):149-57. Doi: [10.1016/j.acvd.2014.01.010](https://doi.org/10.1016/j.acvd.2014.01.010)
17. Saaby L, Poulsen TS, Diederichsen AC, Hosbond S, Larsen TB, Schmidt H, et al. Mortality rate in type 2 myocardial infarction: observations from an unselected hospital cohort. *Am J Med*. 2014 Apr;127(4):295-302. Doi: [10.1016/j.amjmed.2013.12.020](https://doi.org/10.1016/j.amjmed.2013.12.020)
18. Laan AMVD, Horst ENT, Delewi R, Begieneman MPV, Krijnen PAJ, Hirsch A, et al. Monocyte subset accumulation in the human heart following acute myocardial infarction and the role of the spleen as monocyte reservoir. *Eur Heart J*. 2014 Feb;35(6):376-85. Doi: [10.1093/eurheartj/eh331](https://doi.org/10.1093/eurheartj/eh331)
19. Abate E, Hoogslag GE, Leong DP, Bertini M, Antoni ML, Nucifora G, et al. Association between multilayer left ventricular rotational mechanics and the development of left ventricular remodeling after acute myocardial infarction. *J Am Soc Echocardiogr*. 2014 Mar;27(3):239-48. Doi: [10.1016/j.echo.2013.12.009](https://doi.org/10.1016/j.echo.2013.12.009)
20. Matic DM, Milasinovic DG, Asanin MR, Mrdovic IB, Marinkovic JM, Kocic NI, et al. Prognostic implications of bleeding measured by Bleeding Academic Research Consortium (BARC) categorisation in patients undergoing primary percutaneous coronary intervention. *Heart*. 2014 Jan; 100(2):146-52. Doi: [10.1136/heartjnl-2013-304564](https://doi.org/10.1136/heartjnl-2013-304564)
21. Sheng QH, Hsu chih-chi, Li Jian-ping, Hong T, Yong, H. Correlation between fragmented QRS and the short-term prognosis of patients with acute myocardial infarction. *J Zhejiang Univ Sci B*. 2014 Jan;15(1):67-74. Doi: [10.1631/jzus.B1300091](https://doi.org/10.1631/jzus.B1300091)
22. Zheng J, Yarzebski J, Ramesh BP, Goldberg RJ, Yu H. Automatically Detecting

Acute Myocardial Infarction Events from EHR Text: A Preliminary Study. AMIA Annu Symp Proc. 2014 Nov;2014:1286-93. PMID: PMC4419972

23. Laissy JP, Gaxotte V, Ironde-Laissy E, Klein I, Ribert A, Bendriss A, et al. Cardiac diffusion-weighted MR imaging in recent, subacute, and chronic myocardial infarction: a pilot study. J Magn Reson Imaging. 2013 Dec ;38(6):1377-87. Doi: [10.1002/jmri.24125](https://doi.org/10.1002/jmri.24125)

24. Buysschaert I, Carruthers KF, Dunbar DR, Peuteman G, Rietzschel E, Belmans A, et al. A variant at chromosome 9p21 is associated with recurrent myocardial infarction and cardiac death after acute coronary syndrome: the GRACE Genetics Study. Eur Heart J. 2010 May;31(9):1132-41. Doi: [10.1093/eurheartj/ehq053](https://doi.org/10.1093/eurheartj/ehq053)

25. Chew DP, French J, Briffa TG, Hammett CJ, Eli CJ, Ranasinghe I, et al. Acute coronary syndrome care across Australia and New Zealand: the SNAPSHOT ACS study. Med J Aust. 2013 Aug;199(3):185-191. Doi: PMID: 23909541

26. Romero-Farina G, Aguadé-Bruix S, Candell-Riera J, Pizzi MN, Pineda V, Figueras J et al. Acute myocardial infarction: estimation of at-risk and salvaged myocardium at myocardial perfusion SPECT 1 month after infarction. Radiology. 2013 Nov; 269(2):577-84. Doi: [10.1148/radiol.13122324](https://doi.org/10.1148/radiol.13122324)

27. Chua SK, Hung HF, Shyu KG, Cheng JJ, Chiu CZ, Chang CM, et al. Acute ST-elevation myocardial infarction in young patients: 15 years of experience in a single center. Clin Cardiol. 2010 Mar;33(3):140-8. Doi: [10.1002/clc.20718](https://doi.org/10.1002/clc.20718)

28. Denollet J, Pedersen SS, Vrints CJ, Conraads VM. Predictive value of social inhibition and negative affectivity for cardiovascular events and mortality in patients with coronary artery disease: the type D personality construct. Psychosom Med. 2013 Nov/Dec;75(9):873-81. Doi: [10.1097/PSY.0000000000000001](https://doi.org/10.1097/PSY.0000000000000001)

29. Epstein AE, Abraham WT, Bianco NR, Kern KB, Mirro M, Rao SV, et al. Wearable cardioverter-defibrillator use in patients perceived to be at high risk early post-myocardial infarction. J Am Coll Cardiol. 2013 Nov ;62(21):2000-7. Doi: [10.1016/j.jacc.2013.05.086](https://doi.org/10.1016/j.jacc.2013.05.086)

30. Salari N, Shohaimi S, Najafi F, Nallappan M, Karishnarajah I. Application of pattern recognition tools for classifying acute coronary syndrome: an integrated medical modeling. Theor Biol Med Model. 2013;10:57. Doi: [10.1186/1742-4682-10-57](https://doi.org/10.1186/1742-4682-10-57)

31. Anderson ML, Peterson ED, Peng SA, Wang TY, Ohman EM, Bhatt DL, et al. Differences in the profile, treatment, and prognosis of patients with cardiogenic shock by myocardial infarction classification a report from NCDR. Circ Cardiovasc Qual Outcomes. 2013 Nov;6(6):708-15. Doi: [10.1161/CIRCOUTCOMES.113.000262](https://doi.org/10.1161/CIRCOUTCOMES.113.000262)

32. Liu A, Castillo MG, Capewell S, Lucy J, O'Flaherty M. Reduction in myocardial infarction admissions in Liverpool after the smoking ban: potential socioeconomic implications for policymaking. BMJ Open. 2013 ;3:e003307. Doi: 10.1136/bmjopen-2013-003307

33. Hess CN, Shah BR, Peng SA, Thomas L, Roe MT, Peterson ED. The Association of early physician follow-up and 30-day readmission after non-ST-segment elevation myocardial infarction among older patients. Circulation. 2013 Sept;128(11):1206-13. Doi: [10.1161/CIRCULATIONAHA.113.004569](https://doi.org/10.1161/CIRCULATIONAHA.113.004569)

34. Denollet J, Freedland KE, Carney RM, Jonge P, Roest AM. Cognitive-affective symptoms of depression after myocardial infarction: different prognostic importance across age groups. Psychosom Med. 2013 Sept ;75(7):701-8. Doi: [10.1097/PSY.0b013e31829dbd36](https://doi.org/10.1097/PSY.0b013e31829dbd36)

35. Rao SV, McCoy LA, Spertus JA, Krone RJ, Singh M, Fitzgerald S, Peterson ED. An updated bleeding model to predict the risk of post-procedure bleeding among patients undergoing percutaneous coronary intervention: a report using an expanded bleeding definition from the National Cardiovascular Data Registry CathPCI Registry. JACC Cardiovasc Interv. 2013 Sept;6(9):897-904. Doi: [10.1016/j.jcin.2013.04.016](https://doi.org/10.1016/j.jcin.2013.04.016)

36. Hanson I, Kahn J, Dixon S, Goldstein J. Angiographic and clinical characteristics of type 1 versus type 2 perioperative myocardial infarction. Catheter Cardiovasc Interv. 2013 Mar;82(1):622-8. Doi: 10.1002/ccd.24626

37. Saaby L, Poulsen TS, Hosbond S, Larsen TB, Pyndt Diederichsen AC, Hallas J et al. Classification of myocardial infarction: frequency and features of type 2 myocardial infarction. Am J Med. 2013 Sept;126(9):789-97. Doi: [10.1016/j.amjmed.2013.02.029](https://doi.org/10.1016/j.amjmed.2013.02.029)

38. Coloma PM, Valkhoff VE, Mazzaglia G, Nielsson MS, Pedersen L, Molokhia M, et al. Identification of acute myocardial infarction from electronic healthcare records using different disease coding systems: a validation study in three European countries. BMJ Open. 2013 June;3(6):e002862. Doi: [10.1136/bmjopen-2013-002862](https://doi.org/10.1136/bmjopen-2013-002862)

39. Cavender MA, Rajeswaran J, DiPaola L, Houghtaling P, Kiernan MS, Rassi AN et al. Outcomes of culprit versus multivessel PCI in patients with multivessel coronary artery disease presenting with ST-elevation myocardial infarction complicated by shock. *J Invasive Cardiol.* 2013 May;25(5):218-24. Doi: PMID: 23645045
40. Wauters E, Carruthers KF, Buysschaert I, Dunbar DR, Peuteman G, Belmans A, et al. Influence of 23 coronary artery disease variants on recurrent myocardial infarction or cardiac death: the GRACE Genetics Study. *Eur Heart J.* 2013 Apr;34(13):993-1001. Doi: [10.1093/eurheartj/ehs389](https://doi.org/10.1093/eurheartj/ehs389)
41. Toker A, Aribas A, Yerlikaya FH, Tasyurek E, Akbuga K. Serum and Saliva Levels of Ischemia-Modified Albumin in Patients with Acute Myocardial Infarction. *J Clin Lab Anal.* 2013 Mar;27(2):99-104. Doi: [10.1002/jcla.21569](https://doi.org/10.1002/jcla.21569)
42. Fosbol EL, Granger CB, Jollis JG, Monk L, Lin L, Lytle BL, et al. The impact of a statewide pre-hospital STEMI strategy to bypass hospitals without percutaneous coronary intervention capability on treatment times. *Circulation.* 2013 Feb;127(5):604-12. Doi: [10.1161/CIRCULATIONAHA.112.118463](https://doi.org/10.1161/CIRCULATIONAHA.112.118463)
43. Maroon S, Chang AM, Lee B, Salhi R, Hollander JE. HEART score to further risk stratify patients with low TIMI scores. *Crit Pathw Cardiol.* 2013 Mar;12(1):1-5. Doi: [10.1097/HPC.0b013e31827377e1](https://doi.org/10.1097/HPC.0b013e31827377e1)
44. Hsieh MJ, Chen YC, Chen CC, Wang CL, Wu LS, Wang CC. Renal dysfunction on admission, worsening renal function, and severity of acute kidney injury predict 2-year mortality in patients with acute myocardial infarction. *Circ J.* 2013 ;77(1):217-23. PMID:22987074
45. Shacham Y, Leshem-Rubinow E, Ziv-Baran T, Gal-Oz A, Steinvil A, Ben Assa E, et al. Incidence and mortality of acute kidney injury in acute myocardial infarction patients: a comparison between AKIN and RIFLE criteria. *Int Urol Nephrol.* 2014 Dec;46(12):2371-7. Doi: [10.1007/s11255-014-0827-6](https://doi.org/10.1007/s11255-014-0827-6)
46. García-Paredes T, Aguilar-Alonso E, Arboleda-Sánchez JA, Vera-Almazán A, Arias-Verdú MD, Oléa-Jiménez V, et al. Evaluation of prognostic scale Thrombolysis In Myocardial Infarction and Killip. An ST-elevation myocardial infarction new scale. *Am J Emerg Med.* 2014 Nov;32(11):1364-9. Doi: [10.1016/j.ajem.2014.08.026](https://doi.org/10.1016/j.ajem.2014.08.026)
47. Idris H, Lo S, Shugman IM, Saad Y, Hopkins AP, Mussap C, et al. Varying definitions for periprocedural myocardial infarction alter event rates and prognostic implications. *J Am Heart Assoc.* 2014 Oct;3 (6):e001086. Doi: [10.1161/JAHA.114.001086](https://doi.org/10.1161/JAHA.114.001086)
48. Langorgren J, Ebbing M, Igland J, Vollset SE, Nordrehaug JE, Tell GC, et al. Implications of changing definitions of myocardial infarction on number of events and all-cause mortality: the WHO 1979, ESC/ACC 2000, AHA 2003, and Universal 2007 definitions revisited. *Eur J Prev Cardiol.* 2014 Nov;21(11):1349-57. Doi: [10.1177/2047487313493056](https://doi.org/10.1177/2047487313493056)
49. Bengtson LG, Chen LY, Chamberlain AM, Michos ED, Whitsel EA, Lutsey PL, et al. Temporal trends in the occurrence and outcomes of atrial fibrillation in patients with acute myocardial infarction (from the atherosclerosis risk in communities surveillance study). *Am J Cardiol.* 2014 Sept;114(5):692-7. Doi: [10.1016/j.amjcard.2014.05.059](https://doi.org/10.1016/j.amjcard.2014.05.059)
50. Corrada E, Ferrante G, Mazzali C, Barbieri P, Merlino L, Merlini P, et al. Eleven-year trends in gender differences of treatments and mortality in st-elevation acute myocardial infarction in northern Italy, 2000 to 2010. *Am J Cardiol.* 2014 Aug;114(3):336-41. Doi: [10.1016/j.amjcard.2014.05.007](https://doi.org/10.1016/j.amjcard.2014.05.007)
51. Ortolani P, Marino M, Melandri G, Guastaroba P, Corzani A, Berti E, et al. Recent temporal trends for first-time hospitalization for acute myocardial infarction. Treatment patterns and clinical outcome in a large cohort study. *Am Heart J.* 2013 Nov;166(5):846-54. Doi: [10.1016/j.ahj.2013.08.026](https://doi.org/10.1016/j.ahj.2013.08.026)
52. Kübler P, Jankowski EA, Ferenc M, Ponikowski P, Banasiak W, Reczuch K. Comparison of drug-eluting stents to bare-metal stents in ST-elevation myocardial infarction in long-term follow-up. *Kardiol Pol.* 2013;71(1):25-31.
53. Sahin DY, Gür M, Elbasan Z, Kuloglu O, Seker T, Krivrak A, et al. SYNTAX score is a predictor of angiographic no-reflow in patients with ST-elevation myocardial infarction treated with a primary percutaneous coronary intervention. *Coron Artery Dis.* 2013 Mar;24(2):148-53. Doi: [10.1097/MCA.0b013e32835c4719](https://doi.org/10.1097/MCA.0b013e32835c4719)
54. Kelly AM. What is the incidence of major adverse cardiac events in emergency department chest pain patients with a normal ECG, thrombolysis in myocardial infarction score of zero and initial troponin <=99th centile: an observational study? *Emerg Med J.* 2013 Jan;30(1):15-8. Doi: [10.1136/emered-2011-200810](https://doi.org/10.1136/emered-2011-200810)
55. Sarafoff N, Schuster T, Vochem R, Fichtner S, Martinoff S, Schwaiger M, et al. Association of ST-elevation and non-ST-

elevation presentation on ECG with transmural and size of myocardial infarction as assessed by contrast-enhanced magnetic resonance imaging. *J Electrocardiol.* 2013 Mar/Apr;46(2):100-6. Doi:

[10.1016/j.jelectrocard.2012.12.017](https://doi.org/10.1016/j.jelectrocard.2012.12.017)

56. Khafaji HA, Bener AB, Rizk NM, Al Suwaidi J. Elevated serum leptin levels in patients with acute myocardial infarction; correlation with coronary angiographic and echocardiographic findings. *BMC Res Notes.* 2012 May 29;5:262. Doi: [10.1186/1756-0500-5-262](https://doi.org/10.1186/1756-0500-5-262)

57. Reichlin T, Twerenbold R, Reiter M, Steuer S, Bassetti S, Balmelli C, et al. Introduction of high-sensitivity troponin assays: impact on myocardial infarction incidence and prognosis. *Am J Med.* 2012 Dec;125(12):1205-1213.e1. Doi:

[10.1016/j.amjmed.2012.07.015](https://doi.org/10.1016/j.amjmed.2012.07.015)

58. Canali E, Masci P, Bogaert J, Ducci CB, Francone M, McAlindon E et al. Impact of gender differences on myocardial salvage and post-ischaemic left ventricular remodelling after primary coronary angioplasty: new insights from cardiovascular magnetic resonance. *Eur Heart J Cardiovasc Imaging.* 2012 Nov;13(11):948-53. Doi:

[10.1093/ehjci/jes087](https://doi.org/10.1093/ehjci/jes087)

59. Knot J, Kala P, Rohac FP, Petr R, Kova DB, Widimsky P, et al. Comparison of outcomes in ST-segment depression and ST-segment elevation myocardial infarction patients treated with emergency PCI: data from a multicenter registry. *Cardiovasc J Afr.* 2012 Oct;23(9):495-500. Doi: [10.5830/CVJA-2012-053](https://doi.org/10.5830/CVJA-2012-053)

60. Poku JK, Bellamkonda-Athmaram VR, Bellolio MF, Nestler DM, Stiell IG, Hess EP. Failure of prospective validation and derivation of a refined clinical decision rule for chest radiography in emergency department patients with chest pain and possible acute coronary syndrome. *Acad Emerg Med.* 2012 Sept;19(9):E1004-10. Doi: [10.1111/j.1553-2712.2012.01428.x](https://doi.org/10.1111/j.1553-2712.2012.01428.x)

61. Somma KA, Bhatt DL, Fonarow GC, Cannon CP, Cox M, Laskey W, et al. Guideline adherence after ST-segment elevation versus non-ST-segment elevation myocardial infarction. *Circ Cardiovasc Qual Outcomes.* 2012 Sept;5(5):654-61. Doi:

[10.1161/CIRCOUTCOMES.111.963959](https://doi.org/10.1161/CIRCOUTCOMES.111.963959)

62. Zhang H, Tian NL, Hu ZY, Wang F, Chen L, Zhang YJ, et al. Three hours continuous injection of adenosine improved left ventricular function and infarct size in patients with ST-segment elevation

myocardial infarction. *Chin Med J (Engl).* 2012 May;125(10):1713-9. PMID:22800889

63. Wood FO, Leonowicz NA, Vanhecke TE, Dixon SR, Grines CL. Mortality in patients with ST-segment elevation myocardial infarction who do not undergo reperfusion. *Am J Cardiol.* 2012 Aug;110(4):509-14. Doi: [10.1016/j.amjcard.2012.04.019](https://doi.org/10.1016/j.amjcard.2012.04.019)

64. Kelly AM. How useful are the Heart Foundation risk criteria for assessment of emergency department patients with chest pain? *Emerg Med Australas.* 2012 June;24(3):260-5. Doi: [10.1111/j.1742-6723.2012.01536.x](https://doi.org/10.1111/j.1742-6723.2012.01536.x)

65. Miller CD, Thomas MJ, Hiestand B, Samuel MP, Wilson MD, Sawyer J, et al. Cholesteryl esters associated with acat2 predict coronary artery disease in patients with symptoms of acute coronary syndrome. *Acad Emerg Med.* 2012 June;19(6):673-82. Doi: [10.1111/j.1553-2712.2012.01378.x](https://doi.org/10.1111/j.1553-2712.2012.01378.x)

66. Charpentier S, Maupas-Schwalm F, Cournot M, Elbaz M, Botella JM, Lauque D. Combination of copeptin and troponin assays to rapidly rule out non-ST elevation myocardial infarction in the emergency department. *Acad Emerg Med.* 2012 May;19(5):517-24. Doi: [10.1111/j.1553-2712.2012.01350.x](https://doi.org/10.1111/j.1553-2712.2012.01350.x)

67. Palau P, Núñez J, Sanchis J, Husser O, Bodí V, Núñez E, et al. Differential prognostic effect of revascularization according to a simple comorbidity index in high-risk non-ST-segment elevation acute coronary syndrome. *Clin Cardiol.* 2012 Apr;35(4):237-43. Doi: [10.1002/clc.20996](https://doi.org/10.1002/clc.20996)

68. McSweeney JC, Cleves MA, Zhao W, Lefler LL, Yang S. Cluster analysis of women's prodromal and acute myocardial infarction symptoms by race and other characteristics. *J Cardiovasc Nurs.* 2010 Jul/Aug;25(4):311-22. Doi: [10.1097/JCN.0b013e3181cfba15](https://doi.org/10.1097/JCN.0b013e3181cfba15)

69. Rott D, Leibowitz D, Schwartz R, Weiss AT, Behar S, Hod H. Combination of the Killip and TIMI classifications for early risk stratification of patients with acute ST elevation myocardial infarction. *Cardiology.* 2010;117(4):291-5. Doi: [10.1159/000323842](https://doi.org/10.1159/000323842)

70. Huang HD, Tran V, Jneid H, Wilson JM, Birnbaum Y. comparison of angiographic findings in patients with acute anteroseptal versus anterior wall ST-elevation myocardial infarction. *Am J Cardiol.* 2011 Mar 15;107(6):827-32. Doi: [10.1016/j.amjcard.2010.10.070](https://doi.org/10.1016/j.amjcard.2010.10.070)

71. Isilak Z, Kardesoglu E, Aparci M, Uz O, Yalcin M, Yiginer O, Cingozbay BY, et al. Comparison of clinical risk assessment systems in predicting three-vessel coronary artery disease and angiographic culprit lesion in

patients with non-ST segment elevated myocardial infarction/unstable angina pectoris. *Kardiologia Pol.* 2012;70(3):242-50. PMID:22430403

72. Davies AR, Grundy E, Nitsch D, Smeeth L. Constituent country inequalities in myocardial infarction incidence and case fatality in men and women in the United Kingdom, 1996-2005. *J Public Health (Oxf)*. 2011 Mar;33(1):131-8. Doi: [10.1093/pubmed/fdq049](https://doi.org/10.1093/pubmed/fdq049)

73. Gualandro DM, Campos CA, Calderaro D, Yu PC, Marques AC, Pastana AF, et al. Coronary plaque rupture in patients with myocardial infarction after noncardiac surgery: frequent and dangerous. *Atherosclerosis*. 2012 May;222(1):191-5. Doi: [10.1016/j.atherosclerosis.2012.02.021](https://doi.org/10.1016/j.atherosclerosis.2012.02.021)

74. Nozari Y, Geraiely B. Correlation between the serum levels of uric acid and hs-crp with the occurrence of early systolic failure of left ventricle following acute myocardial infarction. *Acta Med Iran*. 2011;49(8):531-5. PMID: 22009810

75. Lakhani MS, Qadir F, Hanif B, Farooq S, Khan M. Correlation of thrombolysis in myocardial infarction (timi) risk score with extent of coronary artery disease in patients with acute coronary syndrome. *J Pak Med Assoc*. 2010 Mar;60(3):197-200. PMID: 20225777

76. Narayan H, Dhillon OS, Quinn PA, Struck J, Squire IB, Davies JE, et al. C-terminal proavopressin (copeptin) as a prognostic marker after acute non-ST elevation myocardial infarction: Leicester Acute Myocardial Infarction Peptide II (LAMP II) study. *Clin Sci (Lond)*. 2011 July;121(2):79-89. Doi: [10.1042/CS20100564](https://doi.org/10.1042/CS20100564)

77. Fennessy MM, Fink AM, Eckhardt AL, Jones J, Kruse DK, VanderZwan KJ, et al. Gender Differences in Fatigue Associated With Acute Myocardial Infarction. *J Cardiopulm Rehabil Prev*. 2010 July/Aug;30(4):224-30. Doi: [10.1097/HCR.0b013e3181d0c493](https://doi.org/10.1097/HCR.0b013e3181d0c493)

78. Hailer B, Naber C, Koslowski B, Van Leeuwen P, Schäfer H, Budde T, et al. Gender-related differences in patients with ST-elevation myocardial infarction: results from the registry study of the ST elevation myocardial infarction network essen. *Clin Cardiol*. 2011 May;34(5):294-301. Doi: [10.1002/clc.20916](https://doi.org/10.1002/clc.20916)

79. Hochholzer W, Reiclin T, Twerenbold R, Stelzig C, Hochholzer K, Meissner J, et al. incremental value of high-sensitivity cardiac troponin T for risk prediction in patients with suspected acute myocardial infarction. *Clin*

Chem. 2011 Sept;57(9):1318-26. Doi: [10.1373/clinchem.2011.162073](https://doi.org/10.1373/clinchem.2011.162073)

80. Jiménez-Navarro MF, Caballero-Borrego J, Rodriguez-Losada N, Cabrera-Bueno F, Marchal JA, Esteban J et. al. Influence of preinfarction angina on the release kinetics of endothelial progenitor cells and cytokines during the week after infarction. *Eur J Clin Invest*. 2011 Nov;41(11):1220-6. Doi: [10.1111/j.1365-2362.2011.02529.x](https://doi.org/10.1111/j.1365-2362.2011.02529.x)

81. Lonborg J, Kelbaek H, Vejlstrup N, Botker HE, Kim WY, Holmvang L, et al. Influence of pre-infarction angina, collateral flow, and pre-procedural TIMI flow on myocardial salvage index by cardiac magnetic resonance in patients with ST-segment elevation myocardial infarction. *Eur Heart J Cardiovasc Imaging*. 2012 May;13(5):433-43. Doi: [10.1093/ejehocard/jer296](https://doi.org/10.1093/ejehocard/jer296)

82. Naranjo-Estupinan NF, Diaz-Quijano FA, Garcia RG. Influencia de la rehabilitación cardíaca sobre la tasa de re-hospitalización en pacientes con infarto agudo de miocardio, Santander, Colombia. *Rev. salud pública [Internet]*. 2012 Sept [cited 2017 Oct 25];14(5):831-41. Available from: <http://www.scielo.org.co/pdf/rsap/v14n5/v14n5a10.pdf>

83. Azuaje F, Devaux Y, Wagner DR. Integrative pathway-centric modeling of ventricular dysfunction after myocardial infarction. *PLoS One*. 2010 Mar 11;5(3):e9661. Doi: [10.1371/journal.pone.0009661](https://doi.org/10.1371/journal.pone.0009661)

84. Wudkowska A, Goch J, Goch A. Ischemia-modified albumin in differential diagnosis of acute coronary syndrome without ST elevation and unstable angina pectoris. *Kardiologia Pol [Internet]*. 2010 [cited 2017 Aug 25];68(4):437-43. Available from: <https://ojs.kardiologiapolska.pl/kp/article/view/985/4167>

85. El-Menvar A, Zubaid M, AlMahmeed W, Sulaiman K, AlNabti A, Singh R, et al. Killip classification in patients with acute coronary syndrome: insight from a multicenter registry. *Am J Emerg Med*. 2012 Jan;30(1):97-103. Doi: [10.1016/j.ajem.2010.10.011](https://doi.org/10.1016/j.ajem.2010.10.011)

86. Zhang HT, Jia ZH, Zhang J, Ye ZK, Yang WX, Tian YQ, et al. No-reflow protection and long-term efficacy for acute myocardial infarction with Tongxinluo: a randomized double-blind placebo- controlled multicenter clinical trial (ENLEAT Trial). *Chin Med J (Engl)*. 2010 Oct;123(20):2858-64. PMID: 21034597

87. Fazlinezhad A, Rezaeian MK, Yousefzadeh H, Ghaffarzadegan K, Kahajedaluee M. Plasma brain natriuretic peptide (bnp) as an indicator of left ventricular function, early outcome and mechanical complications after acute

myocardial infarction. *Clin Med Insights Cardiol.* 2011 Aug;5:77-83. Doi: [10.4137/CMC.S7189](https://doi.org/10.4137/CMC.S7189)

88. Miyamoto T, Obayashi T, Hattori E, Yamauchi Y, Niwa A, Isobe M. Pre-hospital physical activity status affects in-hospital course of elderly patients with acute myocardial infarction. *J Med Dent Sci.* 2010 Mar;57(1):119-26. PMID: 20437772

89. Sakaguchi E, Yamada A, Sugimoto K, Ito Y, Shiino K, Takada K, et al. Prognostic value of left atrial volume index in patients with first acute myocardial infarction. *Eur J Echocardiogr.* 2011 June;12(6):440-4. Doi: [10.1093/ejehocardi/jer058](https://doi.org/10.1093/ejehocardi/jer058)

90. Tsai CL, Magid DJ, Sullivan AF, Gordon JA, Kaushal R, Michael Ho P, et al. Quality of Care for Acute Myocardial Infarction in 58 U.S. Emergency Departments. *Acad Emerg Med.* 2010 Sept;17(9):940-50. Doi: [10.1111/j.1553-2712.2010.00832.x](https://doi.org/10.1111/j.1553-2712.2010.00832.x)

91. Valente S, Lazzeri C, Chiostrì M, Osmanagaj L, Giglioli C, Gensini GF. STEMI patients--the more you bleed, the more you die: a comparison between classifications. *Clin Cardiol.* 2011 Feb;34(2):90-6. Doi: [10.1002/clc.20842](https://doi.org/10.1002/clc.20842)

92. Fleischmann KE, Zègre-Hemsey J, Drew BJ. The New Universal Definition of Myocardial Infarction Criteria Improves Electrocardiographic Diagnosis of Acute Coronary Syndrome. *J Electrocardiol.* 2011 Jan/Feb;44(1):69-73. Doi: [10.1016/j.jelectrocard.2010.10.037](https://doi.org/10.1016/j.jelectrocard.2010.10.037)

93. Scherrer JF, Chrusciel T, Garfield LD, Freedland KE, Carney RM, Hauptman PJ, et al. Treatment-resistant and insufficiently treated depression and all-cause mortality following myocardial infarction. *Br J Psychiatry.* 2012 Feb;200(2):137-42. Doi: [10.1192/bjp.bp.111.096479](https://doi.org/10.1192/bjp.bp.111.096479)

94. Smith OR, Kupper N, Denollet J, De Jonge P. Vital exhaustion and cardiovascular prognosis in myocardial infarction and heart failure: predictive power of different trajectories. *Psychol Med.* 2011 Apr;41(4):731-8. Doi: [10.1017/S0033291710001133](https://doi.org/10.1017/S0033291710001133)

95. Hong JS, Kang HC, Lee SH. Comparison of case fatality rates for acute myocardial infarction in weekday vs weekend admissions in South Korea. *Circ J.* 2010 Mar;74(3):496-502. PMID: 20075558

96. McKinley S, Fien M, Riegel B, Meischke H, Aburuz ME, Lennie TA, Moser DK. Complications after acute coronary syndrome are reduced by perceived control of cardiac illness. *J Adv Nurs.* 2012 Oct;68(10):2320-30. Doi: [10.1111/j.1365-2648.2011.05933.x](https://doi.org/10.1111/j.1365-2648.2011.05933.x)

97. Brink E. Considering both health-promoting and illness-related factors in assessment of health-related quality of life after myocardial infarction. *Open Nurs J.* 2012;6:90-94. Doi: [10.2174/1874434601206010090](https://doi.org/10.2174/1874434601206010090)

98. Salminen-Tuomaala M, Astedt-Kurki P, Rekiaro M, Paavilainen E. Coping experiences: a pathway towards different coping orientations four and twelve months after myocardial infarction—a grounded theory approach. *Nurs Res Pract.* 2012;2012:674783. Doi: [10.1155/2012/674783](https://doi.org/10.1155/2012/674783)

99. Eriksson M, Asplund K, Svedlund M. Couples' thoughts about and expectations of their future life after the patient's hospital discharge following acute myocardial infarction. *J Clin Nurs.* 2010 Dec;19(23-24):3485-93. Doi: [10.1111/j.1365-2702.2010.03292.x](https://doi.org/10.1111/j.1365-2702.2010.03292.x)

100. Garcia RP, Budó MLD, Simon BS, Wunsch S, Oliveira, SG, Barbosa BS. Family experiences post-acute myocardial infarction. *Rev Gaúcha Enferm.* 2013 Sept;34(3):171-8. Doi: <http://dx.doi.org/10.1590/S1983-14472013000300022>

101. Andersson EK, Borglin G, Wilman A. The experience of younger adults following myocardial infarction. *Qual Health Res.* 2013 June;23(6):762-72. Doi: [10.1177/1049732313482049](https://doi.org/10.1177/1049732313482049)

102. Nilsson UG, Ivarsson B, Alm-Roijer C, Svedberg P, SAMMI-study group. The desire for involvement in healthcare, anxiety and coping in patients and their partners after a myocardial infarction. *Eur J Cardiovasc Nurs.* 2013 Oct;12(5):461-7. Doi: [10.1177/1474515112472269](https://doi.org/10.1177/1474515112472269)

103. Andersson EK, Borglin G, Sjöström-Strand A, Willman A. Standing alone when life takes an unexpected turn: being a midlife next of kin of a relative who has suffered a myocardial infarction. *Scand J Caring Sci.* 2013 Dec;27(4):864-71. Doi: [10.1111/j.1471-6712.2012.01094.x](https://doi.org/10.1111/j.1471-6712.2012.01094.x)

104. Cossete S, Frasure-Smith N, Dupuis J, Juneau M, Guertin MC. Randomized controlled trial of tailored nursing interventions to improve cardiac rehabilitation enrollment. *Nurs Res.* 2012 Mar/Apr;61(2):111-20. Doi: [10.1097/NNR.0b013e318240dc6b](https://doi.org/10.1097/NNR.0b013e318240dc6b)

105. Wang YB, Fu XH, Wang XC, Gu XS, Zhao YJ, Hao GZ, et al. Randomized comparison of radial versus femoral approach for patients with STEMI undergoing early PCI following intravenous thrombolysis. *J Invasive Cardiol.* 2012 Aug;24(8):412-6. PMID: 22865313

106. Meterko M, Wright S, Lin H, Lowy E, Cleary PD. Mortality among patients with

acute myocardial infarction: the influences of patient-centered care and evidence-based medicine. *Health Serv Res.* 2010 Oct;45(5 Pt 1):1188-204. Doi: [10.1111/j.1475-6773.2010.01138.x](https://doi.org/10.1111/j.1475-6773.2010.01138.x)

107. Baldachinno, D. Long-term causal meaning of myocardial infarction. *Br J Nurs.* 2010 June/July;19(12):774-81. Doi: [10.12968/bjon.2010.19.12.48656](https://doi.org/10.12968/bjon.2010.19.12.48656)

108. Yashuara Y, Takada S, Tanioka T, Kawanishi C, Locsin RC. Illness experiences of patients with ischemic heart disease during their transitional phase from hospitalization to discharge in Japan. *J Med Invest.* 2010 Aug;57(3-4):293-304. PMID: 20847530

109. Fredriksson-Larsson U, Alsen P, Brink E. I've lost the person I used to experiences of the consequences of fatigue following myocardial infarction. *Int J Qual Stud Health Well-being.* 2013 June;8:20836. Doi: [10.3402/qhw.v8i0.20836](https://doi.org/10.3402/qhw.v8i0.20836)

110. Pereira JMV, Cavalcanti ACD, Santana RF, Cassiano KM, Queluci GC, Guimarães TCF. Nursing diagnoses for inpatients with cardiovascular diseases. *Esc Anna Nery Rev Enferm.* 2011 Oct/Dec;15(4):737-45. Doi: <http://dx.doi.org/10.1590/S1414-81452011000400012>

111. Mussi FC, Gibaut MAM, Damasceno CA, Mendes AS, Guimarães AC, Santos CAST. Sociodemographic and clinical factors associated with the decision time for seeking care in acute myocardial infarction. *Rev Latino-Am Enfermagem.* 2013 Nov/Dec;21(6):1248-57. Doi: <http://dx.doi.org/10.1590/0104-1169.3178.2361>

112. Damasceno CA, Queiroz, TL de, Santos AST. Factors associated with the decision to seek health care in myocardial infarction: gender differences. *Rev Esc Enferm USP.* 2012 Dec;46(6):1362-70. Doi: <http://dx.doi.org/10.1590/S0080-62342012000600>

113. Xanthos T, Pantazopoulos I, Vlachos I, Stroumpoulis K, Barouxis D, Kitsou V, et al. Factors influencing arrival of patients with acute myocardial infarction at emergency departments: implications for community nursing interventions. *J Adv Nurs.* 2010 July;66(7):1469-77. Doi: [10.1111/j.1365-2648.2010.05301.x](https://doi.org/10.1111/j.1365-2648.2010.05301.x)

114. Abed MA, Hall LA, Moser DK. Spielberger's state anxiety inventory: development of a shortened version for critically ill patients. *Issues Ment Health Nurs.* 2011;32(4):220-7. Doi: [10.3109/01612840.2010.546493](https://doi.org/10.3109/01612840.2010.546493)

115. Santos CG, Utsch PRC, Chagas AGF, Vasconcelos LVS, Campos LR, Hijazi MA,

Soares LG, et al. Prevalence of chest pain and anti-angina medication at a University Hospital in Vassouras, RJ state. *Rev Bras Cardiol [Internet].* 2014 [cited 2017 Aug 25];27(4):267-75. Available from: <http://www.rbconline.org.br/artigo/prevalencia-de-dor-toracica-e-medicacao-antianginosa-em-hospital-universitario-de-vassouras-rj/>

116. Mendes AS, Reis VRSS, Menezes TMO, Santos CAST, Mussi FC. Access of patients with myocardial infarction to cardiology reference hospitals. *Acta Paul Enferm.* 2014;27(6):505-12. Doi: <http://dx.doi.org/10.1590/1982-0194201400083>

117. Ponte KMA, Silva LF, Aragão AEA, Guedes MVC, Zagonel IPS. Contribution of nursing clinical care for psycho-spiritual comfort of women with acute myocardial infarction. *Esc Anna Nery Rev Enferm.* 2012 Oct/Dec;16(4):666-73. Doi: <http://dx.doi.org/10.1590/S1414-81452012000400004>

118. Ponte KMA, Silva LF, Aragão EA, Guedes MVC, Zaugnel IPS. Contribution of nursing clinical care for psycho-spiritual comfort of women with acute myocardial infarction. *Texto contexto-enferm.* 2014 Jan/Mar 2;23(1):56-64. Doi: <http://dx.doi.org/10.1590/S1414-81452012000400004>

119. Ponte KMA, Silva LF. Nursing care for women with myocardial infarction: promoting sociocultural comfort through care-research. *Rev enferm UERJ [Internet].* 2014 Nov/Dec [cited 2017 Aug 22];22(6):808-14. Available from: <http://www.e-publicacoes.uerj.br/index.php/enfermagemue/rj/article/view/15693/11867>

120. Caveião C, Santos RB, Montezeli JH, Visentin A, Brey C, Oliveira VBCA. Dor torácica: atuação do enfermeiro em um pronto atendimento de um hospital escola. *R Enferm Cent O Min.* 2014 Jan/Apr;4(1):921-8. Doi: <http://dx.doi.org/10.19175/recom.v0i0.427>

121. Gonzalez MA, Valdés EH, Tur BN, Almeida, JC, Giró MLH. Assessment of the nursing actions in the Needle-Door-Time in patients under thrombolytic treatment. *Rev Cubana Enferm [Internet].* 2011 Jan/Mar [cited 2017 Aug 25];27(1):79-87. Available from: <http://scielo.sld.cu/pdf/enf/v27n1/enf09111.pdf>

122. Mussi FC, Mendes AS, Queiroz TL, Costa AL, Pereira A, Caramelli B. Pre-hospital delay in acute myocardial infarction: judgement of symptoms and resistance to pain. *Rev Assoc*

Med Bras. 2014 Jan/Feb; 60(1):63-9. PMID: 24918855

123.DeVon HA, Ryan CJ, Rankin SH, Cooper BA. Classifying subgroups of patients with symptoms of acute coronary syndromes: a cluster analysis. *Res Nurs Health*. 2010 Oct;33(5):386-97. Doi: [10.1002/nur.20395](https://doi.org/10.1002/nur.20395)

124.DeVon HA, Hogan N, Ochs AL, Shapiro M. Time to treatment for acute coronary syndromes: the cost of indecision. *J Cardiovasc Nurs*. 2010 Mar/Apr;25(2):106-14. Doi: [10.1097/JCN.0b013e3181bb14a0](https://doi.org/10.1097/JCN.0b013e3181bb14a0)

125.Coventry LL, Bremmer AP, Williams TA, Jacobs IG, Finn J. Symptoms of myocardial infarction: concordance between paramedic and hospital records. *Prehosp Emerg Care*. 2014 July/Sept;18(3):393-401. Doi: [10.3109/10903127.2014.891064](https://doi.org/10.3109/10903127.2014.891064)

126.McSweeney JC, O'Sullivan P, Cleves MA, Lefler LL, Cody M, Moser DK, et al. Racial differences in women's prodromal and acute myocardial infarction symptoms. *Am J Crit Care*. 2010 Jan;19(1):63-73. Doi: [10.4037/ajcc2010372](https://doi.org/10.4037/ajcc2010372)

127.Jarai R, Huber K, Bogaerts K, Sinnaeve PR, Ezekowitz J, Ross AM, et al. Prediction of cardiogenic shock using plasma B-type natriuretic peptide and the N-terminal fragment of its pro-hormone concentrations in ST elevation myocardial infarction: An analysis from the ASSENT-4 Percutaneous Coronary Intervention Trial. *Crit Care Med*. 2010 Sept;38(9):1793-801. Doi: [10.1097/CCM.0b013e3181eaaf2a](https://doi.org/10.1097/CCM.0b013e3181eaaf2a)

128.Rana S, Tran T, Luo W, Phung D, Kennedy RL, Venkatesh S. Predicting unplanned readmission after myocardial infarction from routinely collected administrative hospital data. *Aust Health Rev*. 2014 Sept;38(4):377-82. Doi: [10.1071/AH14059](https://doi.org/10.1071/AH14059)

129.McSweeney J, Cleves MA, Fischer EP, Moser DK, Wei J, Pettey C, et al. Predicting coronary heart disease events in women: a longitudinal cohort study. *J Cardiovasc Nurs*. 2014 Nov/Dec;29(6):482-92. Doi: [10.1097/JCN.0b013e3182a409cc](https://doi.org/10.1097/JCN.0b013e3182a409cc)

130.Kuhn L, Page K, Rolley JX, Worrall-Carter L. Effect of patient sex on triage for ischaemic heart disease and treatment onset times: a retrospective analysis of Australian emergency department data. *Int Emerg Nurs*. 2014 Apr;22(2):88-93. Doi: [10.1016/j.ienj.2013.08.002](https://doi.org/10.1016/j.ienj.2013.08.002)

131.Hess EP, Perry JJ, Ladouceur P, Wells GA, Stiell IG. Derivation of a clinical decision rule for chest radiography in emergency department patients with chest pain and possible acute coronary syndrome. *CJEM*. 2010 Mar;12(2):128-34. PMID: 20219160

132.Canesin MF, Timerman S. Treinamento de emergências cardiovasculares avançado da Sociedade Brasileira de Cardiologia. São Paulo: Manole; 2013.

133.Ferreira ARPA, Mendes SL, Gonçalves F, Monteiro P, Monteiro S, Pêgo M. Intensive glycemic control in patients with acute myocardial infarction: diabetes time duration counts! *Int J Cardiovasc Sci*. 2015 Dec;28(6):487-95. Doi: <http://www.dx.doi.org/10.5935/2359-4802.20150069>

134.Mello BHG, Oliveira GBF, Ramos RF, Lopes BBC, Barros CBS, Carvalho EO, et al. Validation of the killip-kimball classification and late mortality after acute myocardial infarction. *Arq Bras Cardiol*. 2014 Aug;103(2):107-17. Doi: <http://dx.doi.org/10.5935/abc.20140091>

135.Killip T, Kimball JT. Treatment of myocardial infarction in a coronary care unit: a two year experience with 250 patients. *Am J Cardiol*. 1967;20(4):457-64. PMID: 6059183

136.Conselho Internacional de Enfermeiros. Classificação Internacional para a Prática de Enfermagem - CIPE® - versão 2015. São Paulo: Algor; 2015.

137.Martins HS, Neto RAB, Velasco IT. Emergências clínicas: abordagem prática. 8th ed. Manole: São Paulo; 2013.

138.Pedrosa RBS, Rodrigues Rcm, Padilha KM, Gallani MCBJ, Alexandre NMC. Factor analysis of an instrument to measure the impact of disease on daily life. *Rev Bras Enferm*. 2016 July/Aug;69(4):697-704. Doi: <http://dx.doi.org/10.1590/0034-7167.2016690412i>

139.Lewis SL, Dirksen, SR, Heitkemper MM, Bucher L, Camera IM. Tratado de enfermagem médico-cirúrgica: avaliação e assistência dos problemas clínicos. 8th ed. São Paulo: Elsevier; 2013.

140.Perry G, Potter PA, Elkin MK. Procedimentos e intervenções de enfermagem. 5th ed. São Paulo: Elsevier; 2013.

141.Loscalzo, J. Medicina cardiovascular de Harisson. 2nd ed. Nova York: MacGraw-Hill; 2014.

142.Pesaro AEP, Serrano Júnior CV, Nicolau JC. Acute myocardial infarction - acute coronary syndrome with ST-segment elevation. *Rev Assoc Med Bras*. 2004 Apr/June;50(2):214-20. Doi: <http://dx.doi.org/10.1590/S0104-42302004000200041>

143.Grosmaître P, Le Vavasœur O, Yachouh E, Courtial Y, Jacob X, Mevrán S, et al. Significance of atypical symptoms for the

diagnosis and management of myocardial infarction in elderly patients admitted to emergency departments. Arch Cardiovasc Dis. 2013 Nov;106(11):586-92. Doi: [10.1016/j.acvd.2013.04.010](https://doi.org/10.1016/j.acvd.2013.04.010)

144.Siqueira JTT, Teixeira MJ. Dores orofaciais: diagnóstico e tratamento. São Paulo: Artes Médicas; 2012.

145.Souza RP. Dicionário de Termos Técnicos e Médicos. Joinville: Clube de Autores; 2015.

146.Dodson JA, Arnold SV, Reid KJ, Gill TM, Rich MW, Masoudi FA, et al. Physical function and independence 1 year after myocardial infarction: observations from the Translational Research Investigating Underlying disparities in recovery from acute myocardial infarction: patients' health status registry. Am Heart J. 2012 May;163(5):790-6. Doi: [10.1016/j.ahj.2012.02.024](https://doi.org/10.1016/j.ahj.2012.02.024)

147.Levine DA, Davydow DS, Hough CL, Langa KM, Rogers MAM, Iwashyna TJ, et al. Functional disability and cognitive impairment after hospitalization for myocardial infarction and stroke. Circ Cardiovasc Qual Outcomes. 2014;7(6):863-71. Doi: [10.1161/HCQ.0000000000000008](https://doi.org/10.1161/HCQ.0000000000000008)

Submission: 2017/06/05

Accepted: 2017/11/13

Publishing: 2018/01/01

Corresponding Address

Renata Soares Passinho
Universidade Federal do Sul da Bahia - Campus
Sosígenes Costa
BR 367, Km 31
CEP: 45810-000 – Porto Seguro (BA), Brazil