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REVIEW ARTICLE

Nursing diagnoses related to polytrauma in mobile pre-hospital care

Diagnósticos de enfermería relacionados con el politraumatismo en la atención prehospitalaria móvil

Diagnósticos de enfermagem relacionados ao politraumatismo em atendimento pré-hospitalar móvel

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Abstract

The aim was to identify the most frequent nursing diagnoses in occurrences of multiple trauma, since this activity, exclusive to nurses, is recognized for its work of excellence in pre-hospital care. The results help nurses to act in the context of trauma emergencies and highlight the potential of nursing diagnoses in prioritizing care for patients who are victims of multiple traumas. It was evidenced that the Acute Pain diagnosis was more prevalent, even though pain is subjective and the target of lived experiences in relation to sensory perception. Then, the diagnosis of Impaired Physical Mobility, which involves the ability to move and the immobilizations performed during care, and then the diagnoses related to oxygenation and breathing, such as Ineffective Breathing Pattern and Impaired Gas Exchange. Specific nursing interventions for the diagnoses found were presented.

Descriptors: Nursing Care; Nursing Diagnosis; Emergency Nursing; Multiple Trauma; Emergency Medical Services.

Resumén

El objetivo fue identificar los diagnósticos de enfermería más frecuentes en las ocurrencias de politraumatismo, ya que esta actividad, exclusiva de los enfermeros, es reconocida por su labor de excelencia en la atención prehospitalaria. Los resultados ayudan a los enfermeros a actuar en el contexto de emergencias traumáticas y destacan el potencial de los diagnósticos de enfermería en la priorización de la atención a los pacientes que son víctimas de politraumatismos. Se evidenció que el diagnóstico de Dolor Agudo fue más prevalente, a pesar de que el dolor es subjetivo y objetivo de las experiencias vividas en relación a la percepción sensorial. Luego, el diagnóstico de Movilidad Física Deteriorada, que involucra la capacidad de movimiento y las inmovilizaciones realizadas durante la atención, y luego los diagnósticos relacionados con la oxigenación y la respiración, como Patrón Respiratorio Ineficaz e Intercambio Gaseoso Deteriorado. Se presentaron intervenciones de enfermería específicas para los diagnósticos encontrados.

Descriptores: Atención de Enfermería; Diagnóstico de Enfermería; Enfermería de Urgencia; Traumatismo Múltiple; Servicios Médicos de Urgencia.

Resumo

Objetivou-se identificar os diagnósticos de enfermagem mais frequentes em ocorrências de politraumatismo, uma vez que essa atividade, privativa do enfermeiro, é reconhecida pelo seu trabalho de excelência no atendimento pré-hospitalar. Os resultados auxiliam na atuação do enfermeiro no cenário das emergências em trauma e salientam o potencial dos diagnósticos de enfermagem na priorização da assistência às pacientes vítimas de múltiplos traumas. Evidenciou-se que o diagnóstico Dor Aguda teve mais prevalência, mesmo a dor sendo subjetiva e alvo de experiências vividas em relação a percepção sensorial. Em seguida, o diagnóstico de Mobilidade Física Prejudicada, que envolve a capacidade de mover-se e as imobilizações feitas no atendimento, e então os diagnósticos relacionados à oxigenação e respiração, como Padrão Respiratório Ineficaz e Troca de Gases Prejudicada. Intervenções de enfermagem específicas para os diagnósticos encontrados foram apresentadas.

Descritores: Cuidados de Enfermagem; Diagnóstico de Enfermagem; Enfermagem em Emergência; Traumatismo Múltiplo; Serviços Médicos de Emergência.

Introduction

Pre-hospital care (APH) represents the actions carried out by trained professionals, outside the hospital environment, always aimed at maintaining life and preventing complications, in a way that makes it possible to minimize sequelae[1].

Ordinance No. 2048, of November 5, 2002 of the Ministry of Health (MS), points out the need for the presence of the nursing professional in the service to guide and regulate the actions developed in the service at the national level. In this way, Ordinance n.º 1864, of September 2003, was instituted, which implemented the Mobile Emergency Care Service (SAMU 192) in municipalities and regions of the Brazilian territory, in order to meet urgent and emergency needs dealing with situations of different natures, for example, traumatic, clinical, gynecological, obstetric and psychiatric emergencies[2,3].

In 2004, the SAMU was made official by the Ministry of Health, through Decree No. 5,055, regulated by several ordinances in accordance with the guidelines of the National Policy for the Reduction of Morbidity and Mortality from Accidents and Violence. SAMU offers assistance to people in urgent or emergency situations, at the place where the event takes place, ensuring early care. These services can be activated by telephone through the number 192, standardized throughout the Brazilian territory[1,4].

It is the main component of the National Emergency Care Policy, which aims to protect people's lives and ensure quality in care in the Unified Health System (SUS), in accordance with its doctrinal principles, universality, equity and completeness[4,5].

The main land vehicles for serving the population are Basic Life Support (BLS), manned by at least one rescuer-driver and a nursing technician, and Advanced Life Support (ALS), with a rescuer-driver, a doctor and a nurse[4,5].

In this sense, Resolution of the Federal Nursing Council (COFEN) No. 655, of 2020, regulates the performance of nursing professionals in the APH, whether in direct care, management and/or in the Emergency Regulation Center (CRU)[6].

In addition to this, COFEN Resolution No. 358, of 2009, provides for the Systematization of Nursing Care (SAE) and the implementation of the Nursing Process (NP) in environments, public or private, in which care occurs. In this sense, the systematic evaluation of the Nurse becomes mandatory, also in the pre-hospital scenario, strengthening professional autonomy[7,8].

According to the National Commission of Urgency and Emergency, the recent resolution considers the technical complexity and specificity of SAE in mobile APH, reviewing and updating parameters for the adequacy of patient care. It becomes a landmark, from the moment it legitimizes the practice in this area, presenting regulatory and standardized parameters, safe for both professionals and patients[9].

In this sense, it is noticeable that nurses have increased their scope of action in the field of PHC in recent years, offering an improvement in care, strengthening access and qualifying patient care, in addition to the empowerment and autonomy of nursing professionals, as can be seen seen in the most recent COFEN resolutions that ensure the practices of the professional nurse to the patient in an emergency situation[9,10].

The Systematization of Nursing Care (SAE) is a key tool in the work of nurses, allowing technical, scientific and human resources, which aims to qualify customer care, leading to recognition and appreciation. Law No. 7498, of 1986, implements the SAE in health institutions, whose responsibility is exclusive to the nurse, and provides for the regulation of Nursing Care in Pre-Hospital Care and other occurrences related to Basic Life Support and Advanced Support of Life, from which nurses can perform highly complex procedures and provide nursing care in mobile ICU units and Advanced Life Support on land, air and/or water[5,11].

The Nursing Process (NP), inserted in the SAE, progresses in five continuous and interdependent stages, they are: Patient History, Nursing Diagnosis, Nursing Planning, Nursing Implementation and Nursing Assessment. The patient's history is a sentenced, methodical and continuous process in order to obtain information about the person, family or human community and answers at a certain point in the health and disease process; the Nursing Diagnosis is the interpretation of the collected data, directing the decision-making on the nursing diagnostic concepts that represent the responses of the person, family or human community at a certain moment in the health and disease process and determining the possible interventions; the Nursing Planning determines the results to be achieved and the actions or interventions that will be carried out in view of the identified Nursing Diagnoses; Nursing Implementation is the moment when the actions or interventions determined in the Nursing Planning stage are carried out; and last, but not least, the Nursing Assessment, where the deliberate, systematic and continuous process of verifying changes in the responses of the person, family or human community at a given moment in the health-disease process, indicates whether nursing actions or interventions arrived at the expected result; and checks if there is a need for changes or adaptations in the stages of the Nursing Process[12].

Occurrences related to external causes constitute a strong and emerging concern in the health area. Among these, trauma stands out, understood as an acute health condition capable of causing long-term sequelae that can progress to chronic conditions[13].

Therefore, the PHC to trauma victims requires from the nurse discernment, agility in clinical decision-making, in order to achieve the goals of care. Thus, the NP becomes an essential instrument as it promotes a systematic direction of clinical judgment leading to this practice of critical thinking[12].

Compliance with the NP enables the provision of individualized care, focused on basic human needs, and, in addition, guides decision-making in numerous occurrences experienced by nurses as administrators of the nursing team. It is understood that a service based on priorities, consequently, it is necessary for the nurse to know how to diagnose the pertinent problems that require an immediate

solution and that are susceptible to interventions during the PHC[5,8].

The nurse, as an active member of the APH team, assumes responsibility for the assistance provided to serious victims at risk of death. Therefore, he participates in the elaboration of nursing diagnoses, thinking about the prediction of the victim's needs, establishing priorities, stabilizing him with previously determined interventions and reassessing every minute during transport for appropriate treatment[14].

Recently, pre-hospital care adopted Intermediate Life Support (SIV), implemented through a care protocol. According to COFEN, the protocol was evaluated by a technical chamber composed of doctors, nurses, head of the service, coordinators and specialist nurses in Pre-Hospital Care. Such protocols were based on similar treatment modalities already existing in São Paulo and Campinas, as well as on the expertise of the evaluators[9].

The proposal developed by COFEN provides for the creation of the SIV, with the intention of qualifying the care process and bringing positive responses to victims at risk, even if not yet officially regulated by ministerial ordinances[9].

In addition to this, Resolution No. 641 of 2020 allows the use of extraglottic devices for access to the airway, by nurses, in urgent and emergency situations, in intra and pre-hospital environments, as well as Resolution 648 of 2020 provides for the regulation, training and performance of nurses in performing intra-bone puncture in adults and children in pre- or intra-hospital urgency and emergency situations[15,16].

Thus, the SIV comes with an improvement model, which will provide timely access to critically ill patients and will give nursing professionals greater autonomy in terms of their performance in emergencies, since Intermediate Life Support ambulances must have two nurses or a nurse and a mid-level nurse practitioner, plus a duly licensed ambulance driver[9].

The focus of this study will be the second stage of the NP, the nursing diagnoses used in trauma victims, and the respective interventions, which can provide security for the nurse's performance in this scenario.

Nursing diagnoses are the best and most practical solution for nursing performance in the emergency scenario, it is the clinical judgment based on the responses of the individual, family or community to real, potential health problems or vital processes. Through them, the actions to be performed to achieve satisfactory results in the health and disease process are determined, as they allow the support of nursing interventions to achieve the expected results[17].

The establishment of nursing diagnoses is a private action of the nurse, and for its elaboration, it needs a broad structure of grouped information network, concepts and scientific evidence, contributing to the delineation of knowledge of the profession, particularly in the selection of interventions and results expected with serious and more complex victims[5].

NANDA-I is a non-profit organization composed of several members worldwide, forming an international network, which offers a standardized terminology of nursing diagnoses and presents them all in a classification scheme most used in the world. The NANDA-I Taxonomy provides a way to classify and categorize areas of concern for a nurse. It has 244 nursing diagnoses, grouped into 13 domains (which would be the areas of interest) and 47 classes[17].

COFEN Resolution No. 358 of 2009 regulates the mandatory implementation of the Systematization of Nursing Care in every public and private health institution where professional nursing care takes place. The Nursing Process strengthens the autonomy of nursing and the diagnoses, as well as the other phases of the NP, play a fundamental role in the evolution of the client, which guide the entire planning of the nursing team on the implementation of care that meets the specific needs of all patients in the health and illness process, evaluating the individual's health status and adopting them as a reference[7].

The nurse's role is precisely related to direct patient care, so the nursing practice developed in Pre-Hospital Care involves not only experience and competence in the care provided to the victim, but also physical preparation and emotional self-control to face the challenges that are found in this type of service.

It is hoped, through the present study, to identify the most used nursing diagnoses in occurrences of multiple trauma, since this private activity of nurses is recognized for their work of excellence in APH.

Thus, from the above, the question is what are the nursing diagnoses related to the care of polytraumatized patients in mobile pre-hospital care?

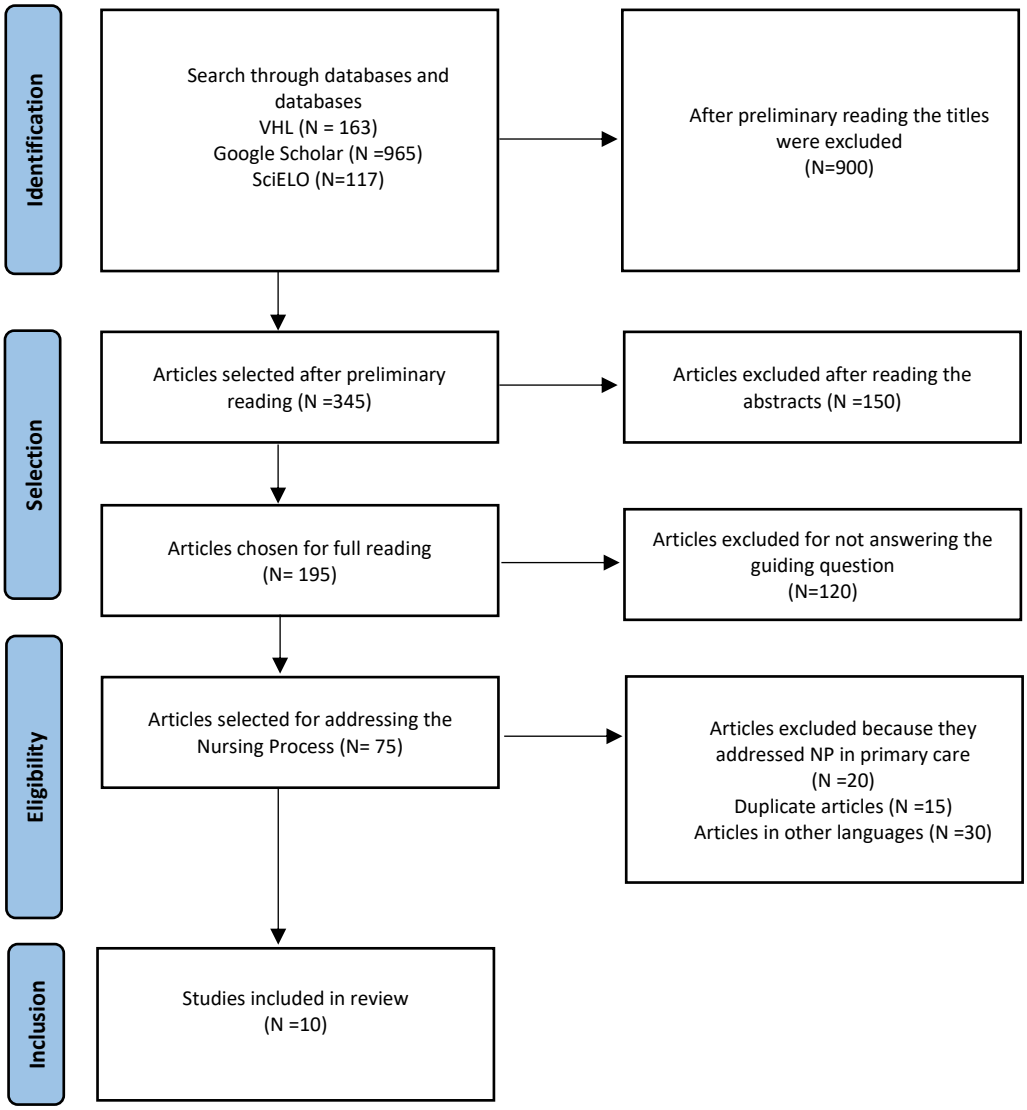
In this sense, the study proposes to identify, in the scientific literature, the nursing diagnoses related to the care of a polytraumatized patient in mobile pre-hospital care and to describe the main interventions for the prevalent diagnoses.

Methodology

This is an integrative literature review in which articles with texts available in online databases were used. The search for articles took place between June and July 2021 in the following databases: Google Scholar, Scientific Electronic Library Online (SciELO) and regional portal of the Virtual Health Library (BVS), using the subsequent Health Sciences Descriptors (DeCS) and Medical Subject Headings (MeSH): Nursing Diagnosis; Multiple Trauma, Emergency Nursing and Emergency Medical Services, using the Boolean operators “OR” and “AND”.

The inclusion criteria established were: complete texts available online in the databases, in Portuguese and English, with no time limit, which addressed the issue of nursing diagnosis aimed at polytrauma in mobile pre-hospital care, which could respond to the research question, carried out from the PICo strategy: What are the nursing diagnoses related to the care of polytraumatized patients in mobile pre-hospital care?

Figure 1. Diagram of the search strategy performed by the author. Itapetininga, SP, Brazil, 2021



The articles were first analyzed by reading the title, those that did not compete with the theme were discarded and the others were passed on to reading the abstract. Subsequently, articles that after reading did not correspond to the research question were excluded. Then, the articles were read in full.

The information extracted from the studies were article title, authors' names, publication date, study objective, main results and conclusion, which were compiled into a table in Microsoft Excel® software.

After this step, the data were categorized using Bardin's Thematic Content Analysis. In this sense, two categories emerged for the discussion of the theme. The following illustrates how the search strategy was carried out in the online databases.

Chart 1. Search in the databases with the mentioned descriptors. Itapetininga, SP, Brazil, 2021

Descriptors	BVS	Google Acadêmico	SciELO
Diagnóstico de Enfermagem OR Enfermagem em Emergência	3	0	0
Diagnóstico de Enfermagem AND Enfermagem em Emergência	0	0	4
Diagnóstico de Enfermagem AND Traumatismo Múltiplo	0	2	0
Diagnóstico de Enfermagem OR Traumatismo Múltiplo	0	0	0
Diagnóstico de Enfermagem OR Serviços Médicos de Emergência	0	0	0

Diagnóstico de Enfermagem AND Serviços Médicos de Emergência	1	0	0
TOTAL	4	2	4

Results

A total of 1,245 articles were found, 163 in the BVS Database Platform, 965 in Google Scholar and 117 in SciELO.

The search in the VHL, from the descriptors nursing diagnosis "OR" emergency nursing, found 152 articles, using a full text filter and available on the platform, decreased to 26. After reading the title and abstract, the final sample consisted of up of 4 articles.

With the descriptors nursing diagnosis "OR" emergency medical services, 11 articles were found, using a full text filter and available on the platform, it dropped to five, but after reading the title and abstract, none of the articles proved to be relevant to the topic of search.

In Google Scholar, using the descriptors nursing diagnosis "AND" multiple trauma, 965 articles were found, with full text filter and available on the platform dropped to 330. After reading the title and abstract, two articles were selected for the final sample.

In the same search, 117 articles were found in SciELO, of which 32 were located when using the nursing diagnosis descriptors "AND" emergency nursing with full text filter and available on the platform dropped to 27, of these, four were selected for the final analysis. Finally, 85 articles were found with descriptors nursing diagnosis "OR" multiple trauma, but none were used after reading the title and abstract because they did not fit the proposed theme.

Among the articles selected from the reading of the title, duplicate articles and those outside the context of the theme were discarded. Thus, 383 were selected for full reading.

After this step, two articles resulted in Google Scholar; in SciELO four articles and in the VHL four articles, totaling 10 studies for the final sample. Table 3 contains information about the studies that were selected for final analysis. To perform the tabulation of the data of the articles, the following requirements were used: title of the article, name of the authors, objective of the study, main results and conclusion.

Chart 2. Data tabulation of selected articles. Itapetininga, SP, Brazil, 2021

Title	Auhor	Objective	Results/Discussion	Conclusão
Validação do diagnóstico troca de gases prejudicada em adultos no atendimento de emergência[19]	Darli MCB, Rossi LA, Cyrillo RMZ, Canini SRMS e Carvalho EC.	Validate the content of the defining characteristics of the nursing diagnosis "impaired gas exchange" for adult clients with respiratory and oxygenation changes in emergency care.	The dyspnea condition must be carefully evaluated by the nurse, the interpretation of the nursing diagnosis "impaired gas exchange" must be confirmed with the help of complementary exams, so the nurse needs to have a thorough knowledge of the symptoms for an advanced physical examination.	The study proposed an opportunity to improve the planning of nursing care, to show the importance of understanding the factors related to this diagnosis and evaluation of the client in a situation of respiratory failure.
Diagnóstico de enfermagem em vítimas de trauma atendidas em um serviço pré-hospitalar avançado móvel[20]	Cyrillo RMZ, Dalri MCB, Canini SRMS, Carvalho EC e Lourencini RR.	To identify nursing diagnoses in trauma victims treated at an advanced mobile emergency service in the interior of São Paulo.	Nursing diagnoses were identified in the following subcategories: oxygenation/breathing needs, circulation needs and perception needs, but only the diagnoses were analyzed: Acute pain; Ineffective airway clearance; Ineffective breathing pattern; Ineffective tissue perfusion; Risk of impaired thermoregulation; Impaired physical mobility and risk of infection.	Nursing diagnoses were found in the category of psychobiological needs that, if not promptly met, represent a serious threat to life. Identifying diagnoses allows nurses to detect and control risks early and individually plan the care provided to these patients, providing immediate and effective actions.
O cuidado de enfermagem a vítimas de traumas múltiplos: uma revisão integrativa[21]	Cavalcanti CDK, Ilha P, Bertocello KCG	Evaluate the available evidence on the factors present in the nursing process in the emergency unit with a focus on diagnoses.	Even citing 7 nursing diagnoses were analyzed in the article only: Acute pain; Risk of unbalanced body temperature; Impaired tissue integrity and impaired gas exchange.	There is a lack of scientific production on the use of nursing diagnoses for patients who are victims of multiple traumas. Still, there is a need to deepen and apply the ND in the care process of the polytraumatized patient in order to reduce the damages.

Diagnósticos de enfermagem em vítimas de traumas nas primeiras seis horas após o evento[22]	Sallum AMC, Sousa RMC.	Identify the frequency of nursing diagnoses in trauma victims in the first 6 hours after the traumatic event and verify the relationship of these diagnoses with mortality.	The most frequent nursing diagnoses were: Risk of infection; Impaired skin integrity; Acute pain and impaired tissue integrity.	The data added information that could assist in the training and performance of nurses in the context of trauma emergencies and highlighted the potential of nursing diagnoses to evaluate the results and quality of care.
Diagnósticos reais e proposta de intervenção de enfermagem para os pacientes vítimas de múltiplos traumas[23]	Bertoncello KCG, Cavalcanti CDK, ILHA P.	Identify nursing diagnoses presented by patients who were victims of multiple traumas treated between February and April 2012 and, later, propose nursing interventions.	The article brought 9 nursing diagnoses in patients who were victims of multiple traumas, but focused on: Acute pain; Impaired physical mobility; Impaired tissue integrity; Impaired skin integrity; Ineffective Breathing Pattern and Self-Care Deficit (dressing, eating, intimate hygiene and bathing).	Identified the most frequent care needs focused by nurses who evaluate and provide initial care to patients with multiple traumas treated in the emergency unit.
Diagnósticos de risco e propostas de intervenções de enfermagem aos pacientes vítimas de múltiplos traumas[24]	Bertoncello KCG, Cavalcanti CDK, ILHA P, Nascimento ERP.	Identify risk nursing diagnoses in patients, victims of multiple traumas, according to NANDA taxonomy II and propose nursing interventions, based on the NIC.	Ten most frequent risk diagnoses were found, but the article delved into the following diagnoses: Risk of unstable blood glucose; Risk of fluid volume imbalance; Risk of peripheral neurovascular dysfunction; Risk of vascular trauma; Risk of body temperature imbalance and Risk of infection.	For a total of 41 patients, 19 different diagnoses were obtained, but the article considered 10 more frequent, focusing on only 6. Nurses need to be able to develop interventions focused on diagnoses in a preventive way, in order to avoid possible and potential complications of the clinical picture.
Diagnóstico de enfermagem em pacientes classificados nos níveis I e II de prioridade do protocolo Manchester[25]	Souza CC, Mata LRF, Carvalho EC e Chianca TCM.	Identify possible nursing diagnoses in patients classified in priority levels I and II, according to the Manchester protocol.	In 40 analyzed cases, 11 nursing diagnoses were found focusing on: Acute pain; Ineffective breathing pattern; Impaired gas exchange; Nausea and Risk of Electrolyte Imbalance.	The diagnosis of Acute pain was the most common among patients, which shows the need to train nurses about the feeling of pain, even though it is subjective. With the Manchester protocol, nurses can quickly detect and control problems in order to positively affect the prognosis.
Diagnóstico de enfermagem mais utilizados em serviço de emergência[26]	Okuno MFP, Costa N, Lopes MCBT, Campanharo CRV, Batista REA.	Identify the main nursing diagnoses used by experts in the emergency area.	The NDs that reached consensus were: Impaired gas exchange; Ineffective breathing pattern; Risk of infection; Risk of impaired skin integrity; Impaired skin integrity and risk of falls.	By identifying the most frequent ND in APH, it guides and facilitates comprehensive nursing care, providing subsidies for the development of individualized care plans for critically ill patients.
Validação clínica do diagnóstico de enfermagem "00085 Mobilidade Física Prejudicada" em vítimas de múltiplos traumas[27]	Ferreira RC, Duran ECM.	Clinically validate the nursing diagnosis "Impaired Physical Mobility", identifying its prevalence, defining characteristics, related factors and associated conditions by calculating the accuracy measures and generating decision trees, as well as clinically and etiologically characterizing victims of multiple traumas.	The frequency of the nursing diagnosis studied was 88.10% with the defining characteristic of "difficulty turning around" prevalent.	Due to a scarce number of studies, there was a difficulty in comparing the findings, but this diagnosis showed a high prevalence among victims of multiple traumas, being considered characteristic of this population. Attesting to the validity of a particular diagnosis by comparing the findings increases its relevance and strengthens the clinical utility of diagnostic indicators.
Diagnósticos de enfermagem no processo do cuidar no atendimento pré-hospitalar móvel[8]	Pizzolato AC e Sarquis LMM	Identify nursing diagnoses in the context of mobile pre-hospital care.	The study brought 7 DE according to the ICNP, but those that said about impaired airway clearance and Risk of Aspiration were studied in depth.	The results contribute to reflections about the way of caring in the APH, strengthening a scientific care that promotes the clinical reasoning of nurses.

Discussion

After tabulating the articles found, exhaustively reading the data in the table and analyzing the information contained therein, two categories emerged for discussion of the theme, namely: Most frequent nursing diagnoses in mobile pre-hospital care for polytraumatized patients; Potential risk nursing diagnoses most used in mobile pre-hospital care for polytrauma patients. Finally, nursing interventions related to the most prevalent nursing diagnoses will be presented.

Nursing diagnoses often related to mobile pre-hospital care for polytraumatized patients

The analyzed articles showed a high prevalence in the following nursing diagnoses: Acute Pain; Impaired Physical Mobility; Impaired Skin Integrity; Impaired Tissue Integrity; Ineffective Breathing Pattern and Impaired Gas Exchange.

According to NANDA-I, Acute Pain is in the Comfort domain; Impaired Physical Mobility in the activity/exercise domain; Impaired Skin Integrity and Impaired Tissue Integrity in the safety and protection domain; Ineffective Breathing Pattern in the domain cardiovascular/pulmonary responses and Impaired Gas Exchange in the domain of elimination and exchange[17].

As the main diagnosis and complaint, Acute Pain is defined as an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage according to the International Association for the Study of Pain; sudden or slow onset, from mild to severe intensity, with an anticipated or predictable end, and lasting less than 3 months. It is related to harmful agents, described by: facial expression of pain, verbal report of pain, change in blood pressure, change in heart and respiratory rate and pupillary dilation[17,23].

Pain measurement is an important factor in determining the priority of care, in addition to directing the choice of conduct, even though it is difficult to conceptualize, it is still important to assess the patient's pain[20,25].

Despite being subjective, all victims are exposed to an unpleasant sensory and emotional experience and must be respected individually, that is, the meaning of pain for a polytraumatized victim is related to the lived experiences. The lack of care for pain activates the neural pathways, prolonging the increase in heart and respiratory rate, decreasing the distribution of oxygen in the tissues, decreasing blood perfusion and reflex muscle contraction, and often the importance of pain is reduced, once resuscitation is performed and stabilization in the urgent/emergency situation become a priority[21-23].

The Impaired Physical Mobility diagnosis is conceptualized as a limitation in independent and voluntary movement of the body or one or more extremities. It is related to patient dependence, since injuries from multiple trauma result in temporary or permanent disabilities and disabilities that compromise the ability to perform daily activities and quality of life, therefore, psychosocial aspects are important for care[20,23].

In relation to this ND, the highest prevalence of defining characteristic was “difficulty turning around” and related factor “alteration in the integrity of bone structures”. The study on the validation of this ND in emergency care showed a low number of occurrences of related factors and the data presented were not so significant, but they were still important to characterize the study sample in question[27].

In the domain of safety and protection, two of the aforementioned diagnoses can be found, Impaired Skin Integrity, which is defined as altered epidermis and/or dermis, and Impaired Tissue Integrity, which according to NANDA-I is conceptualized as damage to the mucous membrane, cornea, integumentary system, muscle fascia, muscle, tendon, bone, cartilage, joint capsule and/or ligament.

From the perspective of pre-hospital care, these NDs arise from the occurrence of a traumatic event, where there is a break in the skin, invasion of body structures, caused by accidents and/or falls[23].

Prevalent in critically ill patients, who need rest due to their clinical condition and depend on the team for mobilization. It results in the loss of function of connective, muscular and bone tissues, constituting a risk of survival favoring hemorrhages, infections and secondary traumas. Therefore, the PHC nurse must focus on the structural integrity and physiological function of the skin, taking into account the risk of infection, temperature control, bleeding control[20,21,26].

In addition to the above, in the cardiovascular/pulmonary responses domain we have Ineffective Breathing Pattern and in the elimination and exchange domain we have Impaired Gas Exchange, these two NDs, even being in different domains, are related to conditions that threaten vital functions, its clinical signs are inability to maintain airway patency, very low SATO2 levels, presence of apnea, tachypnea, and dyspnea[25].

Ineffective breathing pattern is defined as inspiration and/or expiration that does not provide adequate ventilation, having as one of the factors related to pain and hyperventilation. These changes in breathing and oxygenation are related to the pulmonary event or not that caused the actual or potential problem. Furthermore, Impaired Gas Exchange is defined as excess or deficit in oxygenation and/or in the elimination of carbon dioxide in the alveolar-capillary membrane, having as a factor related to imbalance in ventilation and hypoxemia[25].

Oxygenation is imperative for people's survival and, therefore, to produce energy to maintain life, when gas exchange does not occur correctly, a secondary brain injury resulting from the primary trauma injury occurs, therefore, the control of cerebral oxygenation and supply of oxygen are relevant in the care[20,23].

A study carried out in 2008 on the validation of the nursing diagnosis Impaired Gas Exchange in adults, in emergency care for multiple trauma patients, presented 27 defining characteristics about the ND in question, which were divided into two tables according to level of more relevant features. In the first table, with 12 defining characteristics, 4 they did not belong to NANDA. It is noteworthy that the defining characteristics hypercapnia, abnormal arterial blood gases, decreased oxygen content and decreased SATO2 are changes that evidence the need for breathing and oxygenation in emergency care of a multiple trauma[19].

In addition, according to the same study of 12 defining characteristics, 5 were not found in NANDA-I, namely: Agitation; Vascular resistance; Fatigue; Lethargy and tight-lipped breathing. As an important variable, the article brought the Ph – acid-base balance, levels of CO2,

SATO2, which are indicative of metabolic and respiratory changes and dyspnea (unpleasant subjective sensation of breathing). These changes must be carefully evaluated by nurses in pre-hospital care so that they recognize the condition as discomfort when breathing or "shortness of breath", since these patients usually present rapid and shallow breaths, seeming to be anxious[19].

Nursing diagnoses linked to the "RISK OF" category most used in mobile pre-hospital care for polytraumatized patients

Just as the most frequent nursing diagnoses were cited, several articles also brought diagnoses of potential risk, which are worth specifying in a subcategory. Those at risk were: Risk of Infection; Risk of Ineffective Thermoregulation present in the safety and protection domain and Risk of Electrolyte Imbalance in the nutrition domain.

The Infection Risk ND is defined in NANDA-I as susceptibility to invasion and multiplication of pathogenic organisms that can compromise health, presenting as related factors, tissue destruction, trauma, invasive procedures, immunosuppression, chronic diseases and increased environmental exposure to pathogens[17,24,26].

This is the most frequent and serious complication of trauma patients, being considered one of the biggest challenges for the health team, since in the patient victim of multiple traumas, epithelial injury is common, hindering the arrival of nutrients and oxygen, together with invasive procedures and reduced primary defenses, facilitates the infectious process. The evolution to sepsis, septic shock or organ dysfunction sustains the concern of the professional in this situation, since there is a high number of invasive procedures. It is noteworthy that the speed with which these procedures need to be performed does not ignore the fact that the technical precepts of asepsis and antisepsis must be respected[20,22,24].

Also, in the safety and protection domain, we have the Risk of Ineffective Thermoregulation ND, which is conceptualized as susceptibility to temperature fluctuations between hypothermia and hyperthermia that can compromise health. In order to maintain ideal conditions, the organism needs to have its body temperature within very narrow limits, so temperatures above or below this limit can compromise other needs[17,20].

Not treating body temperature increases energy expenditure, which interferes with the transport of gases, altering the circulatory and respiratory systems as well as hydroelectrolytic, hematological and hormonal changes. In the emergency room, for the physical examination, the patient is exposed to the environment where there may be programmed air conditioning, which influences the deceleration of metabolism and temperature regulation, the same also happens inside a vehicle during transport. , the victim, in turn, has a convective temperature drop, which is a loss of up to 12% of total body heat. This drop in temperature also occurs due to lack of thermal protection (blankets/blankets) on the part of the service, or due to direct contact with an object, that is, administration of cold infusions[20,21,24].

Circulation transports and distributes vital nutrients, maintaining body fluids at adequate levels, favoring body metabolism and enabling homeostasis. In this sense, the studies identified the nursing diagnosis Risk of Electrolyte Imbalance, which is described as susceptibility to changes in serum electrolyte levels that can compromise health. This ND is defined as hydroelectrolytic changes, bleeding or fluid loss, associated with traumatic injuries and burns, which can cause hypovolemia and dehydration[20,24].

Risk factors cited in one study are impaired regulatory mechanisms, diabetes, vomiting, and pain. In this case, diabetic patients with diabetic ketoacidosis may present different clinical manifestations such as weakness, dry skin and mucous membranes, drowsiness, disorientation, nausea, vomiting and abdominal pain. Recognition of signs and symptoms in this emergency situation is favorable for nurses to make a decision and understand the correct diagnosis, in order to carry out an appropriate intervention[25].

Nursing interventions related to the most used Nursing Diagnoses in polytraumatized patients

The Nursing Interventions Classification (NIC) presents a set of direct or indirect interventions, focusing not only on the individual, but also on the family, the community and the context in which they are inserted[28].

Therefore, in view of one of the objectives of these studies, specific nursing interventions for victims of multiple traumas during pre-hospital care will be presented.

Chart 3. Nursing interventions related to the most cited Nursing Diagnoses. Itapetininga, SP, Brazil, 2021

Nursing Diagnosis	Nursing Interventions
Acute pain	Pain assessment, intensity and factors that interfere with pain; Cardiac and vital signs monitoring; Observation related to pain; Assessments of physical and emotional state; Promote comfort by carefully positioning painful areas; Observe the occurrence of non-verbal indicators of discomfort, especially in patients who are unable to communicate effectively; Offer relief with prescribed pain relievers.
Impaired Physical Mobility	Monitor vital signs; Prevent falls; Promote care in bed/stretcher rest; Control pressure on areas of the body to prevent pressure injuries;

	Supervise the skin; Control positioning, pain, neurological status, peripheral sensitivity and venous insufficiency.
Impaired Skin Integrity / Impaired Tissue Integrity	Monitoring vital signs; Assistance in self-care; Skin care: topical treatments; Circulatory care: venous insufficiency; Skin supervision; Beware of bed/stretcher rest; Prevent pressure injuries; Perform water control.
Ineffective Breathing Pattern / Impaired Gas Exchange	Neurological monitoring; Airway aspiration; Ventilatory assistance; Airway control; Respiratory monitoring; Oxygen therapy; Anxiety reduction.
Risk of Infection	Monitor systemic signs and symptoms and sites of infection and vulnerability to infection; Monitor changes in energy/discomfort level; Maintain patient asepsis; Provide adequate skin care in swollen areas, examine skin and mucous membranes for hyperemia/cyanosis; Promote adequate nutritional intake.
Risk of Ineffective Thermoregulation	Promote a warm environment; Remove cold and damp clothes; Monitor temperature and symptoms of hypothermia; heart monitoring; Cover with heated blankets; Minimize stimuli avoiding the precipitation of ventricular fibrillation; Administer warm fluids; Monitor color, skin temperature, vital signs and respiratory status.
Risk of Electrolyte Imbalance	Observe and maintain venous access with a caliber; Monitor hemodynamic response, oxygenation condition, fluid load, body fluid eliminations.

Final Considerations

Nurses must obtain knowledge of the causes surrounding the symptomatology, improving and qualifying themselves in the findings to perform an adequate physical examination, and consequently, finding the best diagnoses for that situation.

It appears that the Acute Pain diagnosis had a higher prevalence, even though pain is subjective and the target of lived experiences in relation to sensory perception. Then the diagnosis of Impaired Physical Mobility, and then the diagnoses related to oxygenation and breathing, such as Ineffective Breathing Pattern and Impaired Gas Exchange.

As limitations of the study, it is evident that there is a shortage of research related to nursing diagnoses in pre-hospital care. Several studies have pointed out time as a limiting factor for making a more specific diagnosis for each patient's need.

It is considered relevant to understand the reality of PHC services that sometimes meet situations that involve health education, transport, comfort in terminality, social, environmental and spiritual problems, as well as transit in different scenarios such as public roads, workplace, home, shelters, remote and invasion areas, among others.

It is important that the nurse is qualified for these services, always with a holistic view, focusing on the priority signs and symptoms to select the most appropriate diagnosis regarding the situation presented and then carry out the conduct in a safe and timely manner.

That this study can serve as an inspiration and recommendation for further searches on the subject, thus bringing new guidelines and information regarding the use of the nursing diagnosis in the care of the polytraumatized victim.

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