



REVIEW ARTICLES

Clinical characteristics of COVID-19 patients and the main nursing diagnoses

Características clínicas dos pacientes COVID-19 e os principais diagnósticos de enfermagem

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Abstract

AIMS: to present a reflection on the clinic of patients infected by COVID-19 and to propose the main nursing diagnoses based on International Classification for Nursing Practice (ICNP®).

METHOD: this is a reflection study, in which the selection criteria used were articles indexed in the MEDLINE, LILACS and BDNF databases published between December 2019 and April 2020, in English and Portuguese.

RESULTS: 10 scientific articles were part of the study, which made it possible to know the symptomatologic profile of the disease, with emphasis on the classic triad of COVID-19, which is cough, shortness of breath and fever. It revealed that the basic human need most affected in this patient profile is oxygenation in view of hypoxemia being the main complication, for which the clinical outcome was negative, especially in elderly patients.

CONCLUSION: there was a shortage and studies related to nursing in the face of this pandemic, but it was possible to conclude that ICNP® is one of the taxonomies that can be used to implement nursing diagnoses and intervention, the most frequent nursing diagnoses are related to the basic human and social need for oxygenation and vascular regulation.

Keywords: Coronavirus; COVID-19; SARS-CoV-2; nursing; nursing diagnosis.

Resumo

OBJETIVO: apresentar uma reflexão sobre a clínica dos pacientes contaminados pela COVID-19 e propor os principais diagnósticos de enfermagem baseados na Classificação Internacional para a Prática de Enfermagem (CIPE®).

MÉTODO: trata-se de um estudo de reflexão, na qual utilizaram-se como critérios de seleção, artigos indexados nas bases de dados MEDLINE, LILACS e BDNF publicados entre dezembro de 2019 a abril de 2020, no idioma inglês e português.

RESULTADOS: fizeram parte do estudo 10 artigos científicos o que possibilitou conhecer o perfil sintomatológico da doença, com destaque para a tríade clássica da COVID-19 que é tosse, falta de ar e febre. Revelou que a necessidade humana básica mais afetada nesse perfil de paciente é a oxigenação tendo em vista hipoxemia ser a principal complicação, para as quais o desfecho clínico foi negativo, principalmente, em pacientes idosos.

CONCLUSÃO: evidenciou-se a carência e estudos relativos à enfermagem frente a essa pandemia, porém foi possível concluir que a CIPE® é uma das taxonomias que pode ser utilizada para implementar os diagnósticos e intervenção de enfermagem, os diagnósticos de enfermagem mais frequentes estão relacionados a necessidade humana básica de oxigenação e regulação vascular.

Palavras-chave: Coronavírus; COVID-19; SARS-CoV-2; enfermagem; diagnósticos de enfermagem.



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ABBREVIATIONS: BSHN, Basic Social Human Needs; COVID-19, Corona virus disease; ICNP, International Classification for Nursing Practice; SARS-CoV-2, Severe Acute Respiratory Syndrome Coronavirus 2; WHO, World Health Organization.

Introduction

In December 2019, the first serious cases of pneumonia of unknown origin appeared in Wuhan, China, and it was immediately identified as the new Coronavirus (SARS-CoV-2), spreading rapidly throughout China, and in more than 180 other countries and territories. This SARS-CoV-2 virus causes the disease declared by the World Health Organization (WHO) as the Corona Virus Disease (COVID-19) [1, 2, 3].

Initially, many of the patients of the outbreak in Wuhan, would have some labor relation with a large seafood market and animals such as camels, cattle, cats, and bats, suggesting the spread of animals to people. However, an increasing number of patients supposedly had no exposure to the animal market, indicating the occurrence of dissemination from person to person. Currently, it is well established that this virus has a high and sustained transmissibility among people [1, 4, 5].

Faced with the evolution and spread of the disease around the world, WHO declared worldwide that COVID-19 constitutes a public health emergency of international interest and, for that, immediately adopted measures to control and flatten the disease growth curve around the world, through four strands of the front lines: the first is to prepare and be ready; the second, detect, prevent, and treat; third, reduce and suppress; and the fourth, innovate and improve [3, 6].

Nursing professionals are the only ones responsible for direct nursing care to severe and at risk patients, and they are directly in the front line, working every seven days of the week tirelessly, showing that even with limited resources and subhuman conditions in face of the current pandemic the world is living, nursing has been and continues to be fundamental in all four aspects implemented by WHO [6].

Moreover, COVID-19 brought tremendous pressure and disastrous consequences for public

health and health systems in Wuhan, as well as in Iran, Italy and other countries [2].

Therefore, when observing the behavior of the pandemic, it was possible to perceive that the virus spreads quickly, due to its high pathogenic power in humans and, although it is still little known, it has shown that the world is united through several researchers who they have, in turn, been looking for solutions that can contain their progress. Thus, it is necessary to rethink the importance of systematizing nursing care as a strategy to reorganize care processes in this pandemic moment.

The systematization of nursing assistance is a scientific methodology that the professional uses to improve nursing care through the survey of problems and clinical judgment, providing greater safety to patients, improving the quality of care and greater autonomy for nursing professionals [7]. It is imperative and private for nurses to systematization of nursing assistance, being organized in five interrelated, interdependent, and recurrent stages, being: I. collection of nursing data, II. nursing diagnosis, III. nursing planning, IV. implementation, V. nursing assessment [7, 8].

The implementation and evaluation of nursing actions in addition to the other steps mentioned above seek to identify and resolve the basic social human needs (BSHN) affected by all patients, and in particular, those affected by COVID-19, which is the focus of this research. In this perspective, we recognize the care provided by the BSHN, as guiding elements of the practice of the nursing team and related to nursing care, in its three levels: psychobiological needs, psychosocial needs and psycho-spiritual needs [9].

After identifying health problems, it is necessary to use a taxonomy to implement nursing diagnoses and their interventions. Among the classification systems, the International Classification for Nursing Practice (ICNP[®]) stands out, developed by the International Nurses Council, and recognized by WHO as a classification related to the family of classifications. It is configured as a classification system developed to try to supply the need for a universal language within nursing, for the person, family, and community in different places, in order to allow spatial and temporal comparisons [10 -15].

Historically and today, nurses have always played an important role in prevention, infection control, isolation, cost containment and other actions involving public health, as initially advocated by Florence Nightingale, the precursor of reducing the number of cases of infection in the infection in the world with the simple measure which was the hand washing and the institution of measures such as separation of the severe from the non-severe in war camps.

And in the face of this pandemic, millions of fellow nurses around the world are exercising their functions under enormous pressure to combat COVID-19, and for this, putting their lives at risk. It is worth mentioning that many of these nurses and health professionals, in addition to fighting the disease, are working to alleviate the humanitarian crisis with limited supplies of personal protective equipment, such as surgical mask, N95 respirators and PFF2 mask or equivalent, glasses, hat, apron, gloves, face shield.

In this sense, we must remember the importance nursing had in the Crimean War through Florence Nightingale, who revolutionized, sharing nursing knowledge, which reduced the spread of diseases at the time and saved lives.

Two centuries later we are living again a scenario of war, facing this overwhelming pandemic, and nursing is exposed once again to make history, changing the way of thinking, doing, how to do and when to do, through skills, abilities and, specially, the attitudinal. That said, comes the clinical and reflective judgment, involving the nursing process that brings nurses a method of how to organize their care and have the autonomy to provide safe and quality nursing care to patients who are victims of COVID-19, avoiding exposing your health as far as possible as a professional.

In view of the scarcity of research involving nursing in direct assistance to critically ill patients in this pandemic moment, this research aims to contribute to arouse the interest of health professionals in carrying out other scientific works, involving COVID-19. Given the above, the present study aimed to present a reflection on the clinic of patients infected by COVID-19 and propose the main nursing diagnoses based on ICNP®.

Methodology

It is a reflection study, which was based on a literature review, in addition to the researchers' perception of the subject addressed. We sought to discuss studies in the field of health sciences involving patients with COVID-19, ranging from moderate to severe signs and symptoms and were assisted in the hospital environment.

In view of the aforementioned statements, the option for this type of study was justified, given that they are emerging information, involving nursing care for patients who are victims of COVID-19.

The selection criteria for the articles were: to be published from December 2019 until the second half of April 2020. The data collection of the studies occurred from the second half of April to May 10, 2020. The selected databases to search for the studies were: Medical Literature Analysis and Retrieval System Online (MEDLINE) / PUBMED, Latin American and Caribbean Literature in Health Sciences (LILACS) and Nursing Database (BDENF). The languages were English and Portuguese, used Medical Subject Headings (MeSH) to search PUBMED and Health Sciences Descriptors (DeCs) for the other databases.

It used boolean search operators "AND", "OR" and "NOT" were used, crossing terms such as "COVID-19", "SARS-CoV-2", "clinical manifestations", "Nursing" and "Nursing diagnoses" in the two selected languages. After the selection and search for studies, original articles, case reports in series and brief scientific reflections were included in the research.

For the construction of nursing diagnoses and their interventions, the authors used reasoning and clinical judgment in the face of all information published in studies involving the clinical manifestations of patients affected by COVID-19.

To systematize the extracted information, it was necessary to use a spreadsheet built by the authors in Excel and, thus, judge the compromised BSHN that gave rise to the nursing diagnostic labels.

Results and discussions

In order to better understand the results and discussions of this research, two categories were defined, the first related to presenting studies

involving the clinical manifestations of patients with COVID-19 patients and the second category to proposing the main diagnoses and nursing interventions from the basic human needs committed according to the guidelines of the International Classification for Nursing Practice- (ICNP®) version 2017 [15].

Characterization of clinical manifestations of patients with COVID-19

Initial research shows that hypertension, diabetes, and cardiovascular diseases (myocardopathy and coronary artery disease) were the most frequent comorbidities in affected patients, and with higher mortality rates in these individuals [16-18].

Other researchers claim that, in addition to hypertension, other pre-existing diseases, such as chronic lung diseases, addictions such as smoking were part of the previous pathological history of these patients. It is worth noting that most of these comorbidities are related to elderly patients who are more likely to die [1, 18].

In view of the clinical manifestations, a recent study [1, 17], involving a case series of patients admitted to the intensive care unit, revealed, that the most common signs and symptoms were cough, shortness of breath and fever, these are part of the clinical trial of patients with suspected or confirmed COVID-19. Such signs were mild and evolved to severe hypoxemic respiratory failure, requiring mechanical ventilation. After intubation and mechanical ventilation coupling, the patients evolved to refractory hypotension non-fluid responsive and requiring vasopressors.

Furthermore, researchers revealed that some patients presented other signs and symptoms and even other diseases with a strong relation with the SARS-CoV-2 virus such as nausea or vomiting, diarrhea, productive cough with expectoration, fatigue, headache, hemoptysis, dizziness, lowering of the level of consciousness, ataxia, myalgia, acute cerebrovascular disease (ischemic and hemorrhagic stroke), epilepsy, hyposmia, neuralgia [1, 18-20].

Regarding laboratory tests, patients have already arrived with anemia and worsened according to the progress of the disease, others

had positive troponin-T [16], D-dimer higher than 1µg/mL was associated with worse prognosis, fatal result by COVID-19, the imaging tests show pulmonary consolidation, opacity in "frosted glass" and bilateral pulmonary infiltrate [1, 18].

Although COVID-19 is a disease that is still little known about it, it has been observed that its worst complication occurs at the pulmonary level with rapid progression to hypoxemia. In addition, patients may present several clinical outcomes, as revealed in the study [18], such as sepsis, cardiac arrest, Adult Respiratory Distress Syndrome, heart failure, septic shock, coagulopathies, acute kidney injury, acidosis, arrhythmias and other secondary infections such as mechanic ventilation-associated pneumonia.

Table 1 shows in a systematic and didactic way the selection of articles that were published presenting the clinical profile of the victims of COVID-19 and who had their hospitalization.

In the period related to the study clipping, there was no article in the LILACS and BDEF database, involving nursing and COVID-19, thus, all studies were selected in the PUBMED / MEDLINE database.

TABLE 1 – Distribution of selected articles involving COVID-19*.

Publication month	Authors	Study type
January	Huang et al. [19].	Retrospective study
February	Guan et al. [1].	Retrospective cohort
	Chung et al.[5].	Editorial
March	Ruan [2].	Editorial: Comments
	Arentz et al. [4].	Clinical Case Series
	Pavan et al. [17].	Multicenter case series
April	Zhou et al. [18].	Retrospective cohort
	Newby et al.[6].	Reflection study
	Bavishi et al. [16].	Editorial
	Mao et al [20].	Retrospective observational study of case series.

*All articles were published in 2020

Main nursing diagnoses based on ICNP®

The COVID-19 patients present a mild, moderate, and severe clinical picture, with high transmission of the disease through droplets, aerosol, and contact.

As already shown by the studies, these patients, when they are admitted to the intensive care unit, have several of their basic and social human needs (BSHN) compromised and, for this reason, it is imperative to develop the systematization of nursing assistance, to implement measures that promote prevention, quality and safety of life, organizing work processes and providing a logical structure on which nursing care is based, having as a principle the improvement of the client-centered quality of care, so that their needs are worked on their entirety and individuality.

The nursing process implies an implementation of nursing care so that the work is performed within a protocol directed to all diagnoses assessed by the nurse [7, 21].

In view of the above, the systematization of nursing assistance represents at this moment of a pandemic the alternative available to the nurse for the adequacy of work processes through the alignment of function and duties of the nurse,

seeking to rescue the specificities of nursing, with the purpose of occupying a space as a professional inserted in the front line, developing various actions within the process of caring for these patients.

Therefore, the International Classification for Nursing Practice-ICNP® version 2017, considered a broad and complex terminology representing the domain of nursing practice, is an international standard to facilitate the collection, storage and analysis of nursing data through different health definitions, languages and geographical regions [10, 14, 15]. They also reinforce that such classification is part of the WHO family of International Classifications, representing the domain of nursing practice at the global scope [10, 14, 15].

Thus, without pretending to exhaust all the content on the subject at hand in this research, we opted to present the main BSHN, ND, and nursing interventions, involving all clinical manifestations based on recent research regarding this profile of patients admitted to the Intensive Care Unit (**Table 2**). However, it is expected that researchers, teachers, and nursing academics will be encouraged to carry out other studies that may revalidate their care outcomes.

TABLE 2 – Distribution of the main diagnoses and nursing interventions related to infected with COVID-19 in adult intensive care unit according to ICNP® [14,15].

Need affected	Diagnosis	Nursing intervention
PSYCHOBIOLOGICAL NEEDS		
Oxygenation	Dyspnea	-Auscultate breath sounds, observing the presence of adventitious noises;
		-Assess the tissue perfusion;
		-Evaluate hemodynamic rate (saturation, heart and respiratory rate and level of consciousness);
		-Evaluate respiratory rate and depth every two hours;
		-Keep the bed headboard elevated 35 to 45°;
		-Monitor the agitation signals;
		-Check oxygen saturation by pulse oximetry or arterial blood gas;
		-Follow stress tolerance level;
		-Provide urgent material for advanced airway to avoid dissemination and contamination.
	Productive expectoration	-Monitor the expectoration keeping all the personal protective equipment;
		-Carry out the respiratory auscultation;
		-Stimulate fluid intake.
	Hypoxia due to congestion	-Position patient in bed in a comfortable way;
		-Prepare material for urgent advanced airway;

Need affected	Diagnosis	Nursing intervention
PSYCHOBIOLOGICAL NEEDS		
	Productive cough	<ul style="list-style-type: none"> -Collect tracheobronchial secretions for exams, paying attention to all the correct paramentation and deparamentation; - Keep the headboard elevated 35 to 45°; -Stimulate fluid intake.
	Impaired gas exchange	<ul style="list-style-type: none"> -Keep the bedside elevation at 90°; -Monitor arterial blood gas and signs of acid-basic imbalance; -Monitor nose wing beats, chest retractions and cyanosis; -Monitor the level of consciousness, blood pressure, pulse, temperature and respiratory pattern; -Monitor signs of pulmonary and systemic congestion; -Monitor arterial blood gas values and pulse oximetry readings.
Oxygenation	Mechanical ventilation	<ul style="list-style-type: none"> -Suction endotracheal tubes with closed tracheal suctioning system; -Evaluate the chest-X-ray with the multidisciplinary team; -Evaluate whether the patient's breathing is synchronous with the mechanical ventilator; -Inspect the position of the endotracheal tube daily; -Keep the bed head elevated between 35 a 45°; -Keep inflated the balloon (<i>cuff</i>) of the endotracheal tube (18 to 22mmHg); -Monitor the attachment position of the endotracheal tube; -Monitor oxygen saturation; - Stay aware of signs of cyanosis; -Promote oral hygiene every six hours or as needed; -Carry out pulmonary auscultation daily; -Check oxygen saturation by pulse oximetry; -Check ventilator alarms for proper functioning.
Nutrition	Impaired deglutition	<ul style="list-style-type: none"> Stay aware of signs and symptoms of aspiration; Assist in feeding; Help the patient to position himself with his head bent forward, preparing to swallow; Assess the deglutition pattern; Orient the patient as to the care to avoid aspiration;
	Diarrhea	<ul style="list-style-type: none"> -Administer rehydration therapy, if prescribed; -Apply moisturizing cream in the perianal region; -Auscultate hydro-air sounds and evaluate peristalsis; -Maintain intimate hygiene; -Observe and record the frequency and characteristics of feces; -Stay aware of signs of dehydration;
Elimination	Nausea	<ul style="list-style-type: none"> -Delete sight and unpleasant odor from the feeding area; -Explain the nausea cause and duration, if known; -Identify the factors that cause or enhance the nausea; -Limit fluids during meals; -Promote oral hygiene frequently.
	Vomiting	<ul style="list-style-type: none"> -Aspirate secretions to unblock the gastric tube; -Evaluate the characteristics of vomit with regard to volume, color and odor; -Evaluate the state of hydration of the patient; -Sanitize the oral cavity after vomiting; -Identify environmental or biological factors capable of stimulating vomiting; -Research the factors that cause/contribute to the vomiting; -Maintain venous hydration with drip control; -Monitor the frequency, quantity, consistency, color e odor of vomiting; -Monitor respiratory rate; -Monitor fluid intake and elimination; -Maintain elevated headspace between 35 and 45°;

Need affected	Diagnosis	Nursing intervention
PSYCHOBIOLOGICAL NEEDS		
Physical activity	Fatigue	<ul style="list-style-type: none"> -Control the patient's effort; -Identify factors that contribute to and trigger fatigue; -Monitor signs of fatigue; -Plan advanced airway material.
Physical and environmental safety	Risk of secondary infection	<ul style="list-style-type: none"> - Assess the sites and catheter insertion (venous, urinary) for the presence of hyperemia; -Shift the patient if necessary with a surgical mask; -Monitor signs and symptoms of infection; -Guide the patient and companion as to hand washing; -Keep hand washing strictly and/or proceed with the application of alcohol gel.
Vascular regulation	Arrhythmia	<ul style="list-style-type: none"> -Analyze cardiovascular function and the imminent risk of arrhythmia after patient's effort; -Auscultate the heart sounds; -Evaluate the phonetics of heart sounds; -Evaluate the patient's arterial blood pressure; -Evaluate the patient's pulse, arterial blood pressure and the level of consciousness; -Evaluate the patient's heart rhythm; -Identify heart changes on the monitor or the electrocardiographic trace; -Carry out 12-lead standard electrocardiogram; -Report the presence of sinus, atrial, junctional or ventricular arrhythmias to the professionals of the team; -Check for signs of lethal arrhythmias (ventricular fibrillation, ventricular tachycardia) with lowering of the level of consciousness.
	Altered arterial blood pressure	<ul style="list-style-type: none"> - Stay aware of signs of changes in the level of consciousness; -Stay aware of dizziness complaints; -Auscultate heartbeats and breathing sounds every four hours; -Evaluate color, temperature and texture of the skin; -Evaluate heart monitoring. -Control arterial blood pressure; -Monitor the presence of dyspnea and fatigue; -Monitor complaints of seizures; -Stay aware of signs of bleeding.
	Risk of bleeding	<ul style="list-style-type: none"> -Monitor results of laboratory tests; -Observe and record the presence of blood; -Observe the presence of ecchymoses, petechiae, hematomas in the patient's body.
Thermal regulation	Fever	<ul style="list-style-type: none"> -Apply cold compress to the frontal, axillary and inguinal regions; -Evaluate response to medication; -Stimulate fluid intake; -Identify the etiology of the fever; -Observe disorientation/confusion reactions;
Neurological regulation	Impaired consciousness	<ul style="list-style-type: none"> -Monitor changes in the level of consciousness, through the Glasgow coma scale; -Monitor fetal heartbeats; -Monitor seizures; -Monitor level of consciousness; -Monitor breathing pattern.
	Seizure	<ul style="list-style-type: none"> -Observe signals and symptoms in seizure; -Protect the head by placing, if necessary, a pillow at the head; -Check vital signs; -Administer medication according to institution's protocol and medical prescription.

Need affected	Diagnosis	Nursing intervention
PSYCHOBIOLOGICAL NEEDS		
Senso perception	Musculoskeletal pain	<ul style="list-style-type: none"> -Evaluate the pain in terms of frequency, location and duration; -Evaluate the effectiveness of the drug after administration; -Register of characteristics of the pain; - Check the subjective signs of pain.
PSYCHOSOCIAL NEEDS		
Gregarious	Social isolation	<ul style="list-style-type: none"> -Evaluate social support through team with paramentation and security; -Stimulate and maintain social isolation; -Avoid dissemination and contamination of people.

The clinical manifestations due to SARS-CoV-2 virus infection presented by patients in this review study provide professionals in the field with the opportunity to work with various nursing diagnoses that have emerged from the compromised basic human needs of these patients.

In this sense, nursing has increasingly sought to develop scientifically based nursing actions in accordance with the real needs of the patient, family and community, which applies to patients with COVID-19, remembering that, whatever the nursing intervention, it is necessary to first consider the safety of you and the team.

With regard to this study, this contributes to the advancement of knowledge and debate on nursing care needs for COVID-19 patients, in addition to promoting a presentation of the main diagnoses and nursing interventions based on the applicability of ICNP® in Brazil. Therefore, it collaborates with the advancement of the classification system and standardization of the nursing language used in the clinical practice of the intensive care nurse, based on the construction of the mentioned diagnoses that will contribute to the continuity of care for the person with COVID-19.

Final considerations

It was possible, from this research, to observe that patients infected with SARS-CoV-2, present the classic triad of fever, cough and dyspnea, in addition, studies have shown that the signs start slightly and evolve to clinical worsening, and when it comes to older individuals with comorbidities, the prognosis is worse.

In the face of pulmonary impairment, hypoxemia is one of the most affected complications related to oxygenation BSHN in view of the reflection made by the researchers after the analysis of the research involving patients who were treated at the hospital.

The analysis and critical reflection brought to light that the basic human needs most affected are psychobiological, with oxygenation culminating the largest number of nursing diagnoses, followed by vascular regulation with 4 nursing diagnoses and elimination with 3 nursing diagnoses.

Due to the scarcity of studies involving SNC in the world in the face of COVID-19 in the hospital, it is suggested that further studies be carried out on an urgent basis, aiming to contribute to better nursing care, with regard to patients infected with SARS-CoV-2 and who developed COVID-19 in addition to stimulating other professionals to new research.

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Conflicts of interest disclosure

The authors declare no competing interests relevant to the content of this study.

Authors' contributions.

All the authors declare to have made substantial contributions to the conception, or design, or acquisition, or analysis, or interpretation of data; and drafting the work or revising it critically for important intellectual content; and to approve the version to be published.

Availability of data and responsibility for the results

All the authors declare to have had full access to the available data and they assume full responsibility for the integrity of these results.

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