

Indwelling bladder catheter obstruction in patients with COVID-19*Obstrucción del catéter vesical permanente en pacientes con COVID-19**Obstrução de cateter vesical de demora em pacientes com COVID-19***Eva Natalina Ferreira Costa¹**

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The aim was to describe the nursing interventions that should be implemented to minimize the time to change the Indwelling Bladder Catheter (CVD). Observational, descriptive study with a qualitative approach, of the experience report type, in which it was observed, in the Intensive Care Center for patients diagnosed with COVID-19, that critically ill patients presented CVD obstruction very often. The nurses' actions were related to CVD clearance due to hematuria, often without success, with the need to change the catheter more often than usual. Evidence shows that most acute kidney injuries (AKI) in individuals affected by SARS-CoV-2 are due to the acute tubular injury that they present in 80% of patients. This may be due to prolonged fluid volume reduction and hemodynamic states that decrease renal perfusion. The main nursing interventions aim to reduce the frequency of CVD exchanges and minimize the risk of infection. In care practice, it was possible to present the interventions to be implemented through the development of the nursing process in order to contribute to the reduction of risks of Health Care-Related Infections (HAI).

Descriptors: Nursing; Coronavirus Infections; Urinary Catheterization; Intensive Care Units; Nursing Care.

Resumen

El objetivo fue describir las intervenciones de enfermería que deben ser implementadas para minimizar el tiempo de cambio del Catéter Vesical Permanente (CVD). Estudio observacional, descriptivo con abordaje cualitativo, del tipo relato de experiencia, en el que se observó, en el Centro de Cuidados Intensivos para pacientes con diagnóstico de COVID-19, que los pacientes críticos presentaban con mucha frecuencia obstrucción por ECV. Las acciones de los enfermeros estaban relacionadas con el aclaramiento de la ECV por hematuria, muchas veces sin éxito, con la necesidad de cambiar el catéter con más frecuencia de lo habitual. La evidencia muestra que la mayoría de las lesiones renales agudas (IRA) en individuos afectados por el SARS-CoV-2 se deben a la lesión tubular aguda que presentan en el 80% de los pacientes. Esto puede deberse a la reducción prolongada del volumen de líquidos y estados hemodinámicos que disminuyen la perfusión renal. Las principales intervenciones de enfermería tienen como objetivo reducir la frecuencia de los intercambios de ECV y minimizar el riesgo de infección. En la práctica asistencial, fue posible presentar las intervenciones a ser implementadas a través del desarrollo del proceso de enfermería para contribuir a la reducción de riesgos de Infecciones Relacionadas con el Cuidado de la Salud (IRAS).

Descriptores: Enfermería; Infecciones por Coronavirus; Cateterismo Urinario; Unidades de Cuidados Intensivos; Cuidados de Enfermería.

Resumo

Objetivou-se descrever as intervenções de enfermagem que devem ser implementadas, para minimizar o tempo de troca do Cateter Vesical de Demora (CVD). Estudo observacional, descritivo, com abordagem qualitativa, do tipo relato de experiência, no qual foi observado, no Centro de Terapia Intensiva destinado aos pacientes diagnosticados com COVID-19, que os pacientes graves apresentavam obstrução do CVD com muita frequência. As ações dos enfermeiros estavam relacionadas à desobstrução do CVD devido à hematuria, muitas vezes sem êxito, havendo a necessidade de troca do cateter mais vezes que o usual. As evidências mostram que a maioria das lesões renais agudas (LRA) em indivíduos acometidos pelo SARS-CoV-2 é decorrente da lesão tubular aguda que apresentam em 80% dos pacientes. Esta pode decorrer devido à redução do volume de líquidos prolongada e estados hemodinâmicos que diminuem a perfusão renal. As principais intervenções de enfermagem objetivam reduzir a frequência das trocas do CVD e minimizar os riscos de infecção. Na prática assistencial foi possível apresentar as intervenções a serem implementadas mediante o desenvolvimento do processo de enfermagem de forma a contribuir para redução de riscos de Infecções Relacionadas à Assistência de Saúde (IRAS).

Descritores: Enfermagem; Infecções por Coronavírus; Cateterismo Urinário; Unidades de Terapia Intensiva; Cuidados de Enfermagem.

Introduction

Severe acute respiratory syndrome is caused by coronavirus (SARS-CoV-2) a new virus that is related to SARS-CoV-2 and the Middle East respiratory syndrome coronavirus (MERS-CoV). Comparing with SARS AND MERS, COVID-19 causes damage to the cardiovascular system more evident in the pulmonary vessels leading to cardiac, pulmonary and kidney dysfunctions¹. COVID-19 is an infectious disease caused by the newest types of viruses in the coronavirus family. Both the virus and the disease were unknown until the spread began in Wuhan, China in December 2019².

The most relevant aspects in critically ill patients affected by the pathology are severe hypoxemia and the impact of complications on functional reserves of the different systems of individuals. Like any other critically ill patient, the outcome of the outcome depends on a well-structured team³.

Faced with some complications presented by the disease, renal dysfunction is one of them. Dialysis support cannot be excluded and depending on the degree of hemodynamic involvement, dialysis planning continuously provides intermittent benefits to critically ill patients in relation to their tolerance of this treatment. Most of the time, the biggest problem is not hemodynamic instability, because what takes the individual to the Intensive Care Unit (ICU) is severe hypoxemia that is refractory⁴.

The conduct for monitoring renal function, in addition to laboratory tests, is the installation of an indwelling bladder catheter (CVD), followed by fluid balance control, which is implemented for the purpose of closing the data at the end of the shift. It is understood as CVD the insertion of a urethral catheter to the bladder⁵. It is indicated for individuals with impossibility of spontaneous urination and hemodynamically unstable individuals who need monitoring⁶.

With regard to CVD obstruction, the procedure that must be performed is to change the device and the entire system that composes it. In situations where catheter obstruction is presumed, continuous bladder irrigation and the use of new silicone catheters are advised to prevent new episodes of obstruction, since silicone prevents sediment incrustation, causing future obstructions⁷.

It is noteworthy that this procedure is exclusive to the nurse or qualified doctor. Resolution No. 358/2009 of the Federal Council of Nursing (COFEN) provides for the Systematization of Nursing Care (SAE) and the implementation of the Nursing Process (NP) in public and private environments, where nursing care is provided. recommends that the practice of any procedure by nurses be preceded by an adequate assessment and based on scientific evidence for decision making, which favors the professional in the systematic applicability and documentation of their interventions⁸.

Given the above, this work has the following guiding question: What actions can the nurse take to minimize the frequent exchange of the CVD in critically ill patients affected by COVID-19? That seeks to answer the objective of describing the nursing interventions that can be

implemented to minimize the frequent exchange of indwelling urinary catheters.

Methodology

This is an experience report about the activities developed in the Intensive Care Unit (ICU), experienced by a resident nurse. The activity was promoted from February to June 2021 and consisted of 30 (thirty) meetings aimed at building observation scripts for the nursing process prepared by ICU nurses, together with the continuing education team.

The scenario was the ICU of a federal public hospital located in the city of Rio de Janeiro/RJ, consisting of 13 (thirteen) beds, which serves patients diagnosed with COVID-19, exclusively by the Unified Health System (SUS).

The postgraduate course at the specialization level, in the form of in-service training for Nurses, in the form of residency, aims at a scientifically based preparation, enabling nurses to have technical competence and clinical judgment in the face of the assistance provided to individuals assisted in the Intensive Care Centers of this Institution.

In this way, the topic addressed was chosen due to the increasing number of patients who had indwelling urinary catheter obstruction during their stay in the ICU.

For the analysis and discussion of the data, diversified sources of evidence were used that discuss the topic of nursing care for patients with indwelling urinary catheters diagnosed with COVID-19, the nursing process and the theoretical framework of Wanda de Aguiar Horta (1979), developed from the theory of Basic Human Needs⁹.

For the presentation of this report, we developed a proposal based on the stages of the nursing process (NP) with possible diagnoses and nursing interventions, based on the observation of patients who had CVD obstruction.

For the elaboration of the NP, among the various classification systems, the taxonomy of the North American Nursing Diagnosis Association (NANDA)¹⁰, with its related factors, risk factors, associated conditions, population at risk and defining characteristics; the Nursing Outcomes Classification (NOC) , with measurement scales and indicators; and the Nursing Interventions Classification (NIC), with its activities. All classifications are intended to standardize the language of nursing diagnoses, outcomes and interventions

Nursing diagnoses were based on NANDA-I Taxonomy II¹⁰, the most prevalent ones were used, according to the clinical picture observed in most patients.

Experience Report

Professionals who are working on the front line in the fight against SARS-CoV-2 are exposed to risks and experience challenges daily in health units, but humanized care centered on the patient, safe, ethical, qualified in welcoming them when they enter in the ICU are essential for the care and improvement of the patient's clinical condition.

Health professionals are experiencing difficult times with almost daily official data on COVID-19, considered a highly lethal disease, but still a lot of empirical information, but the union of the entire multidisciplinary team makes a



difference, aiming at prevention and saving lives. In addition, this desire is strengthened by the fear of contracting the disease during the implementation of patient care. This is because most ICU procedures are of high risk for transmission of the pathology.

During the period of work in the ICU for patients diagnosed with COVID-19, it was observed that critically ill patients had bladder catheter obstruction very often.

In order to solve the problem, it is observed that attempts were made to wash the catheter, often without success in the procedure; other patients had urinary retention (bladder) and when the catheter was changed, the patient had hematuria; there were those who had oliguria and after 2 days the catheter was obstructed again.

In the collector, the diuresis presented lumps and sediments. Diuresis was measured once in the morning and once in the evening (6:00 am and 6:00 pm) or if the collector reached more than two thirds of its maximum capacity level. The catheter was positioned every 4 hours, respecting the fixation sites, that is, for men in the suprapubic region and for women in the lower part of the thigh, according to the institution's protocol.

The catheter was handled very gently, and many of these patients were placed in a prone position, which makes frequent handling of the catheter unfeasible. The conduct, in this case, was an evaluation every 2 hours to identify the bladder. In case of any sign of obstruction, the catheter was washed to minimize its frequent changes, since this repetition increases the risk of Health Care-Related infection (HAI)⁶.

The COVID-19 disease is thrombogenic and these microthrombi can occur in different parts of the body and can affect glomerular filtration. Studies report that 80% of severe COVID-19 patients progress to acute renal failure¹¹. It is deduced that this is one of the causes due to the reduction of diuresis, making the patient oliguric, which characterizes the reduction of diuresis levels below 500 ml/24 hours.

Because this diuresis with sediments favors catheter obstruction, its selection is very important, as there are several models of catheters. For this reason, when evaluating the patient's need to use the device, the choice must be the appropriate one for irrigation. The silicone catheter is a good choice since the sediments do not agglomerate inside, according to the recommendations of the National Health Surveillance Agency (ANVISA)⁶.

Evidence to date shows that the majority of acute kidney injury (AKI) in individuals affected by SARS-CoV-2 is due to acute tubular injury, which occurs in 80% of patients. This injury may occur due to prolonged fluid volume reduction and hemodynamic states that decrease renal perfusion. Thus, viral infection in alveolar cells of the angiotensin-converting enzyme 2 (ACE2) type results in the recruitment of defense cells, which automatically produce abundant cytokines that can cause circulatory collapse, causing sepsis, ischemia-reperfusion injury, direct inflammatory injury, coagulation and endothelial cell dysfunction, and apoptosis. However, the pathophysiology of this disease is still unknown¹¹.

The prophylactic measure of deep vein thrombosis in critically ill patients is necessary and favors the individual infected with the new coronavirus. The disease is related to a prothrombotic state with high levels of fibrin and its degradation products, fibrinogen and D-dimer, being associated with a greater possibility of death¹². The empirical use of full anticoagulation protocols is not authorized or scientifically supported, in addition to being possible to cause serious and fatal damage³.

With regard to catheter obstruction, the procedure that must be performed is to change the device and the entire system that composes it. In situations where catheter obstruction is presumed, continuous bladder irrigation and the use of new silicone catheters are advised to prevent new episodes of obstruction, since silicone prevents sediment incrustation causing future obstructions⁷.

In a study with 192 patients with confirmed diagnoses for COVID-19, 10.42% of these patients developed Health Care-Related Infections in a total of 24 occurrences, taking into account that some patients had multiple HAIs. Related to the infectious site, 33.33% were bloodstream infections, 27.17% urinary tract infections, 29.17% ventilator-associated pneumonias and 8.33% skin or soft tissue infections. Among the urinary tract infections 3 were associated with indwelling urinary catheter (CVD)¹³.

The invasion and multiplication of bacteria or fungi in the organs of the urinary system are characterized by urinary tract infection, which may affect the kidneys. This problem is responsible for 35% to 45% of all infections obtained in health facilities. However, the nurse has a fundamental role in the performance of activities in nursing care with regard to urinary elimination, developing interventions to promote and prevent diseases^{14,15}.

It is present as an area that brings very useful information to urinalysis, mainly to identify HAIs, as well as discern localities of the kidneys that are being affected and generating ARI. In this case, it is established that the urinary tract has a common relationship in individuals with SARS-CoV-2, and that the progressive worsening of renal function should be pointed out as a disadvantageous prognostic factor¹⁶.

Authors describe that proteinuria and hematuria were present in most cases at the time of admission of patients to the hospital unit. In an analysis of urinary sediment, this showed the presence of erythrocytes and casts in about 50% of individuals with the disease. One of the emblematic features was the presence of granular casts and renal tubular epithelial cells in the urine more frequently. Renal impairment was also identified more frequently in patients who died, being observed by the higher rate of abnormal creatinine and urea at admission of this patient between 75% and 80% compared to those who were discharged from hospital between 20% and 24%¹⁷.

Health institutions must make use of good practices for the control of infections related to health care so that the use of indwelling urinary catheters is used appropriately. As well as the use of measures to reduce infection, the construction of guidelines and protocols should be based on



scientific evidence, thus aiming at the prevention of urinary tract infection in patients in Intensive Care Centers¹⁸.

Chart 1. Diagnoses, planning and possible nursing interventions for the patient using an indwelling urinary catheter. Rio de Janeiro, RJ, Brazil, 2022

Domain 11. Security/ Protection (NANDA-I 2021/2023) ²⁰	NANDA-I	ND: Risk of Infection (0004) evidenced by invasive assistive device (CVD).
	NOC	Risk Control: Infectious Process (1924) Actions to prevent, eliminate or reduce the threat of infection. Indicators: identification of signs and symptoms.
	NIC	Protection from infection (6550): Prevention and early detection of infection in a patient at risk.
	Prescription	<ul style="list-style-type: none"> - Monitor systemic and localized signs and symptoms of infection; - Inspect the skin and mucous membranes for flushing, extreme heat and drainage; - Hygienize hands with water and liquid soap/ or antiseptic degerming solution before and after manipulation with an indwelling bladder catheter; - Keep the collector at a lower level than the bladder and out of contact with the floor; - Empty the collection bag 2/3 of its capacity; - Maintain continuous drainage of urine always in a closed system; - Clamping the extension of the drainage system when you need to handle the patient; - Sanitize the urethral meatus with water and liquid soap, in one direction, extending along the catheter, immediately after evacuations or at least once during the shift.
Domain 11. Security / Protection (NANDA-I 2021/2023) ²⁰	NANDA-I	ND: Tube care: Urinary (1876): patient management with urinary drainage equipment.
	NOC	Tissue integrity: skin and mucous membranes (1101): structural integrity and normal physiological function of the skin and mucous membranes. Indicators: skin integrity.
	NIC	Tissue integrity: skin and mucous membranes (1101): structural integrity and normal physiological function of the skin and mucous membranes. Indicators: skin integrity.
	Prescription	<ul style="list-style-type: none"> - Keep the urinary drainage system closed, sterile and without obstructions; - Ensure the positioning of the drainage bag below the level of the bladder; - Carry out routine care of the meatus with soap and water during the daily bath; - Correctly fix the indwelling bladder catheter (male supra pubic and female inner thigh); - Change the fixation device every 24 hours, alternating fixation locations and regions.
Domain 11. Security / Protection (NANDA-I 2021/2023) ²⁰	NANDA-I	ND: Risk of urinary tract injury (00250): evidenced by prolonged urinary catheter use.
	NOC	Risk Control (1902): Actions to prevent eliminate or reduce threats to health. Indicators: monitor risk factors.
	NIC	Tube care: Urinary (1876): patient management with urinary drainage equipment.
	Prescription	<ul style="list-style-type: none"> - Decrease the number of times to change the bladder catheter; - Give preference to the silicone device if available at the Institution; - Use single-use (or first-use) anesthetic gel for catheter lubrication and local anesthesia; - Do not force the introduction of the catheter, through resistance in the path.
Domain 3. Elimination and Exchange (NANDA-I 2021/2023) ²⁰	NANDA-I	ND: Impaired urinary elimination (00016).
	NOC	Urinary elimination (0503): storage and elimination. Indicators: amount and color of diuresis.
	NIC	Control of urinary elimination (0590): maintenance of an excellent pattern of urinary elimination.
	Prescription	<ul style="list-style-type: none"> - Monitor, therefore, in case of no solution, talk to the team about a possible change in conduct, such as irrigation with distilled water or 0.9% saline solution; - Count the volume excreted and write it down to control the water balance; - Monitor urinary elimination including frequency, consistency, odor, volume and color.

The nursing process is a methodological instrument that contributes to nursing care, reducing the disorder during the treatment or providing the individual's adequacy and rehabilitation. In addition, it makes it possible to analyze the needs and plan private, comprehensive and humanized care, in addition to the care plan and improvement of practice¹⁰.

The role of nurses in carrying out this process is notorious when exercising their autonomy and possibilities to carry out their work in a unique way, and also contributing

to the other services that make up the interdisciplinary team¹⁹.

In view of the situation experienced, we constructed some of the stages of the nursing process, identifying possible diagnoses and interventions, based on the nursing problems presented by the patients observed in this experience. In this case, we address those related to the urinary system, as shown in Chart 1.

Based on the report of this experience and the stages of the nursing process shown in Chart 1, it is possible to infer that patients affected by COVID-19 who need the use



of an indwelling urinary catheter, more frequently present obstruction of the same, and intensive care of nursing can have the basic human needs⁹ elimination, cutaneous-mucous integrity, (vascular) regulation affected and psychosocial ones (if we consider isolation doubly necessary - due to COVID-19 and ICU admission).

Such issues require knowledge, attitudes and skills of nurses and the ICU's multiprofessional team to act with quality, safety and considering the integrality of patient and family care, and in this case, we include the contribution to the learning of future specialists, who experience their practices in the service, nursing residents.

Conclusion

The use of Indwelling Bladder Catheters in Intensive Care Units is very frequent due to the need for hemodynamic monitoring, such as fluid control, which is essential for critically ill patients. In this case, the qualification of nurses makes all the difference and is widely important in ensuring the quality and safety of care provided to patients, with the NP being paramount.

It is essential to organize the work process, especially in this pandemic period, in the face of an unknown disease, where protocols were developed to facilitate the management of the disease, such as pronation, patient admission, attire and undressing. In addition, even before the pandemic, with the use of the bundle as indicator measures for urinary tract infection and CVD care.

One of the limitations of the study was to implement the proposal presented in this experience report, based on the stages of the nursing process (NP) with possible nursing diagnoses and interventions, based on the observation of patients who presented CVD obstruction.

Thus, the importance of implementing measures to reduce the incidence and risks of infection is highlighted, preventing them and improving in the search for scientific studies, always following good practices in nursing care provided in the ICU. It is worth highlighting the importance of continuing health education for the team, which can occur through conversations and previously scheduled training with professionals on handling bladder catheters and COVID-19.

References

- Dandel M. Heart-lung interactions in COVID-19: prognostic impact and usefulness of bedside echocardiography for monitoring of the right ventricle involvement [published online ahead of print, 2021 Apr 17]. *Heart Fail Rev.* 2021;1-15. <http://doi:10.1007/s10741-021-10108-7>
- World Health Organization (WHO). *National cancer control programmes: policies and managerial guidelines*. 2. ed. Geneva: WHO; 2002.
- Zhou F, Yu T, Du R, Fan G, Liu Z et al. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study *Lancet.* 2020;395(10229):1054-1062. [https://doi.org/10.1016/s0140-6736\(20\)30566-3](https://doi.org/10.1016/s0140-6736(20)30566-3)
- Ronco C. Continuous dialysis is superior to intermittent dialysis in acute kidney injury of the critically ill patient. *Nat Clin Pract Nephrol.* 2007 Mar;3(3):118-9. DOI: 10.1038/ncpneph0423
- Ercole FC, et al. Revisão integrativa: evidências na prática do cateterismo urinário intermitente/demora. *Rev. Latino-Am. Enferm.* [Internet]. 2013 [acesso em 20 ago 2022];21(1):459-468. Disponível em: http://www.scielo.br/pdf/rlae/v21/n1/pt_v21_n1a23
- Ministério da Saúde (BR). Agência Nacional de Vigilância Sanitária - ANVISA. *Medidas de Prevenção Relacionadas à Assistência de Saúde-IRAS* [Internet]. Brasília: MS/ANVISA; 2021 [acesso em 20 ago 2022]. Disponível em: <http://www.riocomsaude.rj.gov.br/Publico>
- Gould CV, et al. Guideline for prevention of cath associated urinary tract infections 2009. *Infection's control and hospital epidemiology.* Centers for Disease Control and Prevention [Internet]. 2010 [acesso em 20 ago 2022];31(1):319-26. Disponível em: <https://www.cdc.gov/infectioncontrol/pdf/guidelines/cauti-guidelines-H.pdf>. Acesso 20 maio 2021.
- Conselho Federal de Enfermagem (COFEn). Resolução n.º 358/2009. Dispõe sobre a Sistematização da Assistência de Enfermagem e a implementação do Processo de Enfermagem em ambientes, públicos ou privados, em que ocorre o cuidado profissional de Enfermagem, e dá outras providências [Internet]. Brasília (DF): COFEn; 2009 [acesso em 20 ago 2022]. Disponível em: http://www.cofen.gov.br/resolucofen-3582009_4384.html
- Horta WA. *Processo de enfermagem*. São Paulo: EPU; 1979.
- Nanda-I. *Diagnósticos de enfermagem da NANDA: definições e classificação 2015/2017*. Porto Alegre: Artmed; 2015.
- Ng JH, Bijol V, Sparks MA, Sise ME, Izzedine H, Jhaveri KD. Pathophysiology and Pathology of Acute Kidney Injury in Patients With COVID-19. *Adv Chronic Kidney Dis.* 2020;27(5):365-376. DOI: 10.1053/j.ackd.2020.09.003
- Al-Samkari H, Karp Leaf Dzik WH, Carlson JCT, Fogerty AE, Waheed A, et al. COVID-19 and coagulation: bleeding and thrombotic manifestations of SARS-Cov-2 infection. *Blood.* 2020. DOI: 10.1182/blood.2020006520
- Storer JM, Cabral BG, Bono CDSR, et al. Desenvolvimento de infecções relacionadas à assistência à saúde em pacientes com covid - 19 em um hospital público do sul do brasil. *Braz J InfectDis.* 2021;25:101382. doi: 10.1016/j.bjid.2020.101382
- Oliveira ACC, Silva ACO. Prevalência de infecção do trato urinário relacionada ao cateter vesical de demora em pacientes de UTI. *Rev Pesq. Saúde* [Internet]. 2010 [acesso em 20 ago 2022];11(1). Disponível em: <http://periodicoseletronicos.ufma.br/index.php/%20revistahuufma/%20article/view/331>
- Mazzo A, Godoy S, Alves LM; Costa IAM, Trevizan MA, Leite Rangel, Elaine Maria. *Cateterismo urinário: facilidades e dificuldades relacionadas à sua padronização* Texto Contexto Enferm [Internet]. 2011 [acesso em 20 ago 2022];20(2):333-9. Disponível em: <http://www.redalyc.org/pdf/714/71419104016.pdf>
- Poloni JAT, Jahnke VS, Rotta LN. Insuficiência renal aguda em pacientes com COVID-19. *Revista Brasileira de Análises Clínicas.* [Internet]. 2020 [acesso em 20 ago 2022]:160-167. Disponível em: <http://www.rbac.org.br/a-rbac/>. Acesso 06 jan 2022.
- Henry BM, Lippi G. Chronic kidney disease is associated with severe coronavirus disease 2019 (COVID-19) infection. *Int Urol Nephrol* 2020;52:1193-1194. <https://doi.org/10.1007/s11255-020-02451-9>.



18. Almeida TPM, Cruz ICF. Diretrizes para a prática de cuidados de enfermagem com cateter vesical em pacientes de alta complexidade: Revisão sistematizada de literatura. Journal Of Specialized Nursing Care [Internet]. 2018 [acesso em 20 ago 2022];10(1). Disponível em: <http://www.jsncare.uff.br/index.php/jsncare/article/view/3013/769>
19. Florentino AO, Silva LF, Roque AC, Lopes A, Silveira GC, Corradini Junior FA, Salvador MB, Ferreira KC, Maria YYM, Veroneze L. Estratégias para a melhoria no fluxo de atendimento aos casos suspeitos de COVID-19. Glob Acad Nurs. 2021;2(Spe.2):e120. <https://doi.org/10.5935/2675-5602.20200120>
20. Herdman STH, Kamitsuru S, Lopes CT. NANDA International Nursing Diagnoses: Definitions and Classification 2021-2023. Twelfth Edition; 2021.

