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EXPERIENCE REPORT

Coronavirus infections: health care planning based on Orem's Nursing Theory

Infecções por coronavírus: planejamento da assistência fundamentado na Teoria de Enfermagem de Orem

Infecciones por coronavirus: planificación de la atención basada en la Teoría de Enfermería de Orem

Tayomara Ferreira Nascimento[I]
ORCID: 0000-0001-8814-6159

Graziela Maria Ferraz de Almeida[I]
ORCID: 0000-0002-5611-3552

Marielle Poyo Bello[I]
ORCID: 0000-0002-3766-1596

Rosemary Pereira Lino da Silva[I]
ORCID: 0000-0001-8529-1422

Cassiana Mendes Bertoncello Fontes[I]
ORCID: 0000-0002-6579-8637

[I] *Universidade Estadual Paulista Júlio de Mesquita Filho. Botucatu, São Paulo, Brazil*

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Corresponding author:
Tayomara Ferreira Nascimento
E-mail: tayomara.ferreira@unesp.br

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ABSTRACT

Objective: to report the experience of professors and students of a graduate course on nursing care in coping with the new coronavirus (COVID-19) based on Self-Care Theory. **Method:** the active methodologies used were a literature search and seminar presentations, with an understanding of Orem's theoretical concepts: health; man; self-care; universal, developmental and health deviation requirements; self-care activities; self-care deficits; the required therapeutic demand; nursing systems. The pandemic was considered a health deviation that requires critical thinking and nursing care planning. Methodological frameworks to classify nursing diagnoses, interventions, and outcomes were used. **Results:** for each health deviation, nursing systems were identified; self-care deficits, diagnoses; actions, interventions; and the form of assessment, outcomes. **Final considerations:** theoretical-practical reflections of the academic context support nursing care planning.
Descriptors: Nursing Process; Patient Care Planning; Nursing Theory; Nursing Diagnosis; Coronavirus Infections.

RESUMO

Objetivo: relatar a experiência de docente e discentes de uma disciplina de pós-graduação sobre assistência de enfermagem no combate ao novo coronavírus (COVID-19) fundamentada na Teoria do Autocuidado. **Método:** as metodologias ativas utilizadas foram a busca na literatura e apresentações de seminários, com apreensão dos conceitos teóricos de Orem: saúde; homem; o autocuidado; os requisitos universais, desenvolvimentais e de desvios de saúde; as atividades de autocuidado; os déficits de autocuidado; a demanda terapêutica requerida; e os sistemas de enfermagem. A pandemia foi considerada um desvio de saúde que demanda pensamento crítico e planejamento da assistência de enfermagem. Foram utilizados referenciais metodológicos das classificações de diagnósticos, intervenções e resultados de enfermagem. **Resultados:** para cada desvio de saúde, foram identificados sistemas de enfermagem; déficits de autocuidado, os diagnósticos; as ações, intervenções; e a forma de avaliação, os resultados. **Considerações finais:** reflexões teórico-práticas do contexto acadêmico corroboram o planejamento da assistência de enfermagem.
Descritores: Processo de Enfermagem; Planejamento de Assistência ao Paciente; Teoria de Enfermagem; Diagnóstico de Enfermagem; Infecções por Coronavírus.

RESUMEN

Objetivo: reportar la experiencia de docentes y estudiantes de un curso de posgrado en cuidados de enfermería en la lucha contra el nuevo coronavirus basado en la Teoría del Autocuidado. **Método:** las metodologías activas utilizadas fueron: búsqueda de literatura y presentaciones en seminarios, con conocimiento de los conceptos teóricos de Orem: salud; hombre; cuidados personales; requisitos universales, de desarrollo y de desviación de la salud; actividades de autocuidado; déficit de autocuidado; la demanda terapéutica requerida; sistemas de enfermería. La pandemia se consideró una desviación de la salud que requiere pensamiento crítico y planificación de la atención de enfermería. Se utilizaron marcos metodológicos para la clasificación de diagnósticos, intervenciones y resultados de enfermería. **Resultados:** para cada desviación de salud, se identificaron sistemas de enfermería; déficit de autocuidado, diagnósticos; acciones, intervenciones; y la forma de evaluación, los resultados. **Consideraciones finales:** reflexiones teórico-prácticas del contexto académico corroboran la planificación del cuidado de enfermería.
Descriptors: Proceso de Enfermería; Planificación de Atención al Paciente; Teoría de Enfermería; Diagnóstico de Enfermería; Infecciones por Coronavirus.

INTRODUCTION

This experience report describes the discussions and reflections in one-to-one and virtual classroom of an optional subject called "Nursing Theories: from the construction of knowledge to NANDA, NIC, and NOC taxonomies" and offered annually by the Nursing Graduate Programs levels of Academic and Professional Master's and Doctorate from the Nursing Department of *Escola de Medicina de Botucatu* of *Universidade Estadual Paulista "Júlio de Mesquita Filho"*. In 2020, four students were enrolled: a doctoral student, two master's students and a special student, not yet linked to the Graduate Program.

The course aimed to: provide subsidies for discussions and reflections on nursing care based on theoretical concepts and assumptions, based on the construction proposed by nursing theorists; correlate the Dorothea Elizabeth Orem assumptions with NANDA-I Nursing Diagnosis Classifications[1], NIC Nursing Interventions[2] and NOC Nursing Outcomes[3], in order to contribute to nursing care planning and the interrelation of theory with practice in nurses' work process in teaching, research, and care[4].

In the second week of class, due to social distancing and quarantine preventive measures to cope with COVID-19, there was a need to organize the virtual meetings. Then, Google Meet was used. The planning proposed in the teaching plan for that course was carried out remotely, maintaining the use of active methodology in the form of presentation of seminars. The themes were related to Dorothea Orem's Theory, Madeleine Leininger's Theory, Jean Watson's Theory, and Betty Newman's Theory.

The proposed methodology favored the reflections and discussions on the theoretical assumptions, and the points of convergence and attention of all discussions were, without a doubt, the pandemic, the quarantine and the world health setting. The first seminar presented was on Dorothea Orem's Theory. The three theoretical constructs' concepts postulated provided subsidies for exemplification of some phenomena related to the pandemic and the way in which the population reacted to preventive measures and to coping with the new coronavirus.

Thus, in line with the phenomena described about world health and the assumptions of the three sub-theories that comprise Orem's Theory, a Nursing Process (NP) model was delimited to the population affected by the pandemic, with the proposition of nursing diagnoses, interventions, and outcomes, according to NANDA-I[1], NIC[2], and NOC[3] classifications.

Orem's theoretical framework

NP is based on theoretical frameworks. Orem's Self-Care Deficit Theory (SCDT) is widely used in Brazil and other countries to guide nursing practice and care in relation to people's self-care requirements, according to the demand client or community therapy[5-6].

Orem's premise is that man has an innate ability to take care of himself. In this sense, the condition that will validate the existence of a nursing requirement would be the absence of continuously maintaining the quantity and quality of care, which are therapeutic for sustaining life and health in the recovery of the disease or injury and in facing its effects.

Orem's General Theory consists of three interrelated factors: Self-Care Theory, which shows how and why people take care of themselves; Self-Care Deficit Theory, which shows why patients can be assisted by nursing; Nursing Systems Theory, which explains why nursing is performed[7].

Self-Care Theory proposes that people should be instructed in self-care or that the same be carried out by their Self-Care Agent, i.e., a caregiver who understands, accepts and fulfills dependent people's self-care needs. Orem identified three categories of self-care: universal, development and health deviation[5].

Universal requirements, according to Orem[5], are associated with life processes, with human integrity maintenance, as well as human structure and functioning, such as breathing in air and drinking enough water and having food.

Development requirements refer to new events and situations that occur in the human environment for the purpose of development. To fulfill the requirements, man needs biological, psychological and social development, in addition to universal self-care requirements[5]. Self-care requirements in health deviation "refer to care or decision making in relation to the health problem identified or diagnosed for the purpose of recovery, rehabilitation and control"[5].

Self-Care Deficit Theory reveals the role of nurses in moments of patient limitations in developing their self-care according to the identification of individuals' self-care needs[7].

Nursing Systems Theory recommends that nursing practices establish and clarify the relationships that need to be created and maintained, encompassing the fully compensatory, partially compensatory system and the educational support system[6].

OBJECTIVE

To report the experience of professors and students of a graduate course on nursing care in coping with the new coronavirus (COVID-19) based on Self-Care Theory.

METHODS

Characterization of the problem amidst the pandemic

In December 2019, in Wuhan, China, cases of pneumonia were reported in thousands of people and which were supposedly related to the location where there is a wholesale market for seafood, dried meat, perishable items, live wild animals used for human consumption[8].

In January 2020, a new coronavirus named 2019-nCoV was officially identified as the reason for the outbreak of pneumonia cases. The signs, clinical symptoms and indicators for the identification of the disease were fever, radiological image with the presence of pneumonia, normal or below normal leukocytes, treatment without improvement for three days with antibiotics, a history of visiting the market and a positive and confirmed sample for 2019-nCoV[8].

The new coronavirus spread quickly around the world and proved to be highly contagious. On January 30, 2020, the World Health Organization (WHO) declared the outbreak as a Public Health Emergency of International Interest. Thus, a pandemic

caused by COVID-19 was declared, due to the increase in the number of cases and deaths in all countries[9].

Considering this world setting, the Ministry of Health (MoH) of Brazil declared it a Public Health Emergency of National Concern (PHENC) on February 6, by Law 13,979/2020, published on 02/07/2020 in *Diário Oficial da União* (Federal Official Gazette). Therefore, measures were taken to deal with this public health emergency resulting from coronavirus (COVID-19)[10].

The Brazilian Sanitary Surveillance Agency (ANVISA - *Agência Nacional de Vigilância Epidemiológica do Brasil*) has carried out periodic weekly reviews of Technical Note[11] on the guidelines for health services regarding prevention and control measures to be adopted in suspected or confirmed cases by the new coronavirus.

The State Health Departments of Brazil, in line with the MoH, in view of local realities, plan and disseminate the measures adopted to contain the pandemic. Like Brazil, governments in other countries incorporate actions to contain the pandemic and minimize the impact of the disease. However, the moment is characterized by uncertainties[9].

Concerning treatment, scientific research has been carried out by scholars from universities, public and private national and international institutes, in search of drug treatment or vaccine against the new coronavirus. Therapies and medications are implemented based on symptoms. The most frequent complication is Acute Respiratory Discomfort Syndrome, followed by cardiac injury and secondary infections. Patients with intractable hypoxemia are progressing to invasive mechanical ventilation[12].

Guidelines for health service professionals in Brazil can be accessed through the manuals produced by ANVISA[11]. However, the best scientific evidence at the moment, to face the pandemic, is to control the sources of infection. To control dissemination, the population has been instructed to maintain environments with good ventilation, wear a mask and adopt personal and hand hygiene measures.

Considering the current global situation and that of Brazil, Brazilian nurses need to organize nursing care for the affected populations. Nursing is one of the professions that is directly facing health problems related to the illness of people infected with the new coronavirus. Nurses play an essential role in the health team and work in the fields of prevention, monitoring and direct assistance in pre and hospital and emergency services in intensive care.

Thus, the present report proposes a NP construction based on Orem's Theory, based on the discussions and reflections carried out during the course's classes, which provided scenery and learning according to the programmatic content.

The teaching strategies employed were carried out in a Virtual Learning Environment, with an active methodology, with students as protagonists in activities of literature review, preparation, and presentation of seminars.

The reflections and theoretical deepening were mediated by professors in relation to the practical application of the Self-Care Deficit theory and concepts for patients with health problems due to the pandemic caused by the coronavirus, based on literature of NANDA-I[1], NIC[2], and NOC[3]. For this purpose, the main nursing interventions were sought, covering the largest number of activities and which, in a certain way, could lead to the expected outcome, in addition to being measured and assessed. The reflections originated by the practical application of Orem's theory encouraged the realization of this report to demonstrate the results obtained.

Thus, the following question emerged: in the face of the pandemic setting, how would NP be characterized from Orem's Self-Care Theoretical Framework[5-6] and the NANDA-I[1], NIC[2] and NOC Nursing Classifications[3]?

RESULTS

Experience outline

The discussions held during virtual classes contributed to formulating and characterizing the mentioned problem. The contributions of Orem's Theory to NP application, in this pandemic moment, support nurses' autonomy and direct the required actions, including those recommended by professional and governmental bodies.

Universal requirements, such as sufficient air intake, balance activities between activity and rest, the balance between loneliness and social interaction and the prevention of dangers to human life, are clearly affected in the current COVID-19 pandemic setting. Development requirements are affected, such as those responsible for promoting life and maturation processes, such as the necessary adaptations for the moment; attitudes of social detachment established to control the spread of the disease; challenges for school activities at all levels of education; difficulties encountered in conducting human activities and, mainly, in relation to internet access.

It is noticed that the way of life development of the population in general is affected and adaptations are being made; however, social conduct and hygiene practices and recommendations are underway that seem momentary and fleeting, but should be transformed into a new way of life in the near future and different from the one that existed before the pandemic.

Regarding the health deviations identified in relation to prevention and treatment to control COVID-19 to spread, the universal requirements for social coexistence that would be hampered by the distance, social isolation and the quarantine established should be considered.

Charts 1, 2 and 3 exemplify how care planning was structured during the course's activities and relate them to Orem's three Nursing Systems and the health deviations arising from COVID-19.

Fully Compensatory System: due to suppressed oxygenation needs, oxygen therapy and invasive ventilation

Chart 1 shows the NP based on Totally Compensatory System. Patients infected with COVID-19 have a demand for the affected health deviation, require invasive and non-invasive oxygenation and are totally dependent on nursing and artificial equipment to provide gas exchange[5].

Partially Compensatory System: patient with mild dyspnea with and without the need for non-invasive oxygen therapy

Chart 2 presents an assistance plan based on Partially Compensatory System. Some infected patients may experience mild respiratory symptoms and need support from non-invasive oxygen therapy, such as inhalations, nasal catheter, or face mask[5].

Chart 1 - Nursing Diagnosis, Nursing Intervention, and Nursing Outcomes related to the health deviation of a patient infected by COVID-19, Botucatu, São Paulo, Brazil, 2020

ND/Self-Care Deficit	NI	NO
Ineffective airway clearance	Medication administration Airway suctioning and management Mechanical ventilation management: invasive	Respiratory status: airway patency Aspiration prevention Mechanical ventilation response
Risk for aspiration	Artificial airway management Vomiting management Chest physiotherapy Neurologic/respiratory/positioning	Nausea & vomiting control Risk detection and control Aspiration prevention Mechanical ventilation response: adult
Dysfunctional ventilatory weaning response	Artificial airway management Airway suctioning/pneumonia prevention Mechanical ventilation management	Gas exchange Mechanical ventilation weaning response Cardiopulmonary status
Impaired spontaneous ventilation Impaired gas exchange	Acid-base management/monitoring Mechanical ventilation management: invasive	Gas exchange Mechanical ventilation and weaning Anxiety level
Impaired bed mobility Impaired physical mobility	Bathing/skin surveillance Body mechanics promotion Self-care assistance Traction/immobilization care Urinary elimination/bowel management Bed rest care Massage	Imobility consequences: physical Fatigue, discomfort and pain/mobility level Tissue perfusion: pulmonary Joint movement
Ineffective health maintenance Ineffective protection	Self-care assistance Medication and pressure management Ventilation assistance Peripheral sensation management Learning facilitation Emergency care Risk identification Coping enhancement Respiratory monitoring Reality orientation	Health promoting and complicance behavior Knowledge: treatment Symptom management Risk detection Knowledge: treatment regimen Symptom management Participation in health care decisions
Ineffective thermoregulation	Bathing Environmental and water management Hyperthermia treatment Vital signs monitoring	Risk control: hyperthermia Thermoregulation
Ineffective peripheral tissue perfusion	Acid-base management Hypervolemia management Hypovolemia management Nutrition management Peripheral sensitivity management Shock management	Circulatory status Tissue integrity: skin & mucous membranes Tissue perfusion: cellular Tissue perfusion: peripheral
Risk for infection	Pressure ulcer prevention Airway management Tube care Tube care: urinary	Imobility consequences: physiological Risk detection and control: infectious process
Risk for impaired skin integrity Risk for pressure ulcer	Circulatory precautions/embolism Hyper/hypoglycemia management Lower extremity monitoring Skin surveillance Immobilization and positioning Vital signs monitoring Fall prevention Nutrition management/planning Bowel constipation/incontinence Infection control Bed rest care Surveillance Immobilization and positioning	Cognition, anxiety and agitation Management/risk detection Infectious process, hyper and hypothermia Respiratory status and vital signs Gastrointestinal, renal, circulatory and cardiopulmonary function Bowel elimination Nutritional status: food and fluid intake Hydration/mobility Acid-base balance
Impaired oral mucous membrane integrity	Water management Oral health maintenance Airway suctioning	Oral hygiene/eye care Risk control: infectious process Hydration

To be continued

Chart 1 (concluded)

ND/Self-Care Deficit	NI	NO
Risk for falls	Area restriction Body mechanics promotion Dementia and pain management	Fall prevention Risk control Agitation and acute confusion level

Note: ND: Nursing Diagnosis; NI: Nursing Intervention; NO: Nursing Outcomes.

Chart 2 – Nursing Diagnosis, Nursing Intervention, and Nursing Outcomes related to the health deviation of a patient infected with mild respiratory symptoms and a positive test for a new coronavirus, Botucatu, São Paulo, Brazil, 2020

ND/Self-Care Deficit	NI	NO
Ineffective health maintenance Decisional conflict	Self-care assistance Self-responsibility facilitation Risk identification Culture brokerage Self-awareness/coping enhancement Behavior modification Health system guidance	Health promoting behavior Knowledge: health promotion and resources Risk detection Participation in health care decisions
Impaired gas exchange	Acid-base/vital signs monitoring Mechanical ventilation management: noninvasive Anxiety reduction	Respiratory status: gas exchange and ventilation
Ineffective breathing pattern	Mechanical ventilation management: noninvasive and weaning Vital signs monitoring Oxygen therapy Anxiety reduction	Respiratory status: airway patency, gas exchange and ventilation Anxiety level
Impaired spontaneous ventilation	Emotional support Airway/acid-base management Mechanical ventilation management: noninvasive/oxygen therapy Vital signs monitoring	Respiratory status: gas exchange Respiratory status: ventilation
Readiness for enhanced self-care	Self-modification and self-care assistance Mutual goal setting Self-responsibility facilitation	Self-care: hygiene compliance behavior
Relocation stress syndrome	Emotional support/counseling Anger control assistance Active listening Mutual goal setting Self-responsibility facilitation	Personal autonomy Coping Loneliness severity Anxiety level Fear level
Anxiety	Antecipatory guidance/counseling Relocation stress reduction Increased safety/emotional support	Anxiety self-control Coping
Fear	Counseling Emotional and decision-making support Support system enhancement Anxiety reduction/presence/calming technique	Fear self-control Fatigue level Fear level
Ineffective thermoregulation	Bathing/hygiene Environmental management/water management Hyperthermia treatment/vital signs monitoring	Risk control: hyperthermia Thermoregulation
Social isolation	Counseling/emotional support Self-awareness enhancement Relocation stress reduction	Social support

Note: ND: Nursing Diagnosis; NI: Nursing Intervention; NO: Nursing Outcomes.

Support-Education System: intended for groups at risk in need of maintaining isolation

Chart 3 presents a care plan to prevent COVID-19 to spread, based on Support-Education System and applies to groups at risk, those who have comorbidities, elderly people and individuals with chronic lung problems.

The general population, who did not have contact with people infected with the new coronavirus, or who do not have symptoms of the disease, maintains universal requirements[13] for preserved oxygenation and elimination. However, it is noteworthy that the same population is vulnerable to having the same requirements shaken if there is no respect for the recommendations of health authorities, such as social distancing and strict hygiene measures. Self-care should be encouraged by nurses as knowledge about COVID-19 advances in order to promote alignment with health education actions. The interventions and activities described above may change if new scientific discoveries about COVID-19 arise.

Chart 3 - Nursing Diagnosis, Nursing Intervention/Nursing Activities and Outcomes to the health deviation of the population at risk not infected and without manifestation of symptoms, Botucatu, São Paulo, Brazil, 2020

ND/Self-Care Deficit	NI/Activities	NO
Feeding self-care deficit	Nutrition management Nutrition monitoring • Discuss supportive habits for purchasing food and isolation restrictions; • Determine food consumption habits; • Facilitate the identification of eating behaviors to be changed.	Self-care: food and activities of daily living Nutritional status
Decreased diversional activity engagement	Activity therapy Recreation therapy • Promote occupational therapy or art therapy activities; • Set goals for performing exercises and recreational activities; • Encourage activities with music therapy.	Social involvement motivation Leisure and play participation Personal well-being Health promoting behavior
Risk for loneliness	Coping enhancement Emotional support Counseling Family integrity promotion Support system enhancement • Develop social skills of distance interaction using the internet; • Promote stress reduction through change.	Social support Family well-being Social interaction skills
Impaired social interaction	Self-awareness enhancement Support group Communication enhancement • Encourage resilience promotion; • Promote remembrance therapy and improve family support, animal therapy, and recreational therapy.	Family well-being Social involvement Social interaction skills Leisure and play participation
Risk for contamination	Infection control Environmental management: community and safety Health policy monitoring • Use masks.	Safe home Self-care: hygiene Personal safety behavior Community risk control: infectious diseases
Anxiety	Anxiety reduction Coping enhancement Relaxation therapy • Use a calm and reassuring approach; • Listen carefully; • Promote anxiety reduction measures.	Anxiety self-control Coping Acceptance: health status Social interaction skills
Risk for spiritual distress	Community disaster preparedness Antecipatory guidance Conflict mediation Coping enhancement Emotional support Environmental management: comfort Relocation stress reduction Resiliency promotion	Psychosocial adjustment: life change Personal well-being Management and risk detection Coping Hope Spiritual health
Risk for infection	Infection protection Infection control • Protect against infection and guidance to avoid physical contact and visits; • When leaving and returning, take the necessary hygiene precautions: wear a mask; do not touch the hand on the face, mouth, eyes and nose; make use of respiratory etiquette; wash the hands with soap and water frequently; • Use 70% gel alcohol, when hand washing is impossible. Surveillance Risk identification	Self-care: hygiene Immunization behavior Community risk control: infectious diseases Risk detection
Deficient knowledge	Counseling Health screening Health education Teaching: disease process • Guide clients on necessary inputs, hygiene techniques, mechanisms for maintaining home isolation and providing support regarding changes in their standard of living with better acceptance and promotion of well-being; • Bring clients to know the aspects of the spread of the disease and take actions to reduce the potential risk for infection.	Knowledge: health behavior Knowledge: disease process/health promotion Information processing Client satisfaction: teaching

Note: ND: Nursing Diagnosis; NI: Nursing Intervention; NO: Nursing Outcomes.

DISCUSSION

Lessons learned

The teaching strategies provided the development of different skills, research, elaboration, preparation and oral exposure in a virtual environment, reflection and theoretical deepening and exercise using nurses' clinical reasoning, in order to correlate which nursing outcomes and indicators would be appropriate to obtain an improved status compared to the current one, within this setting. Reflection activities and subsequent discussion in the light of Nursing Theories provide meaning and strengthen nursing as a science.

The course contributed as an exercise in appropriating the theoretical concepts that underlie nursing practice in current pandemic. Each nursing system, proposed by Orem, was related to the type of health deviation presented and provided guidance to nurses and visibility of nursing care, through appointment of ND, NI, and NO. Thus, it was sought, in a didactic way, to cover care in order to compile the outcomes and indicators that demonstrate its relevance to the named phenomena concomitant with the proposal for nursing interventions.

Nursing systems demonstrate their importance because they also cooperate with nursing planning, not only in relation to care dependency, but also for patients' criticality. In this context, the systems demonstrate patients' dependence on nursing in the face of care needs and the worsening of the disease.

In light of the assumptions and conceptual models of Orem's SCDT, the importance of the role of a care agent as a person who contributes to maintaining the needs of those who are at risk and oriented to maintain the social distancing and/or home isolation, strongly recommended to reduce COVID-19 to spread. In the current management of the spread of a disease, the importance of taking care of oneself and the other is highlighted, corroborating collective care.

Study limitations

The lack of nursing studies on COVID-19 and the systematization of care related to the current pandemic were the limitations of this report.

Contributions to nursing

This report points to the need to develop studies on the systematic nursing care planning for patients with COVID-19 at national and international levels. It corroborates the health care of the population in general so that taking care of oneself is a form of collective care. Orem's Theory provided a basis for understanding the current phenomena of nursing care.

CONCLUSION

In conclusion, the therapeutic demand required by the health deviations pointed out in this report was identified by ND, called self-care deficits according to Orem. The proposed NI are the actions that reinforce global recommendations to cope with the pandemic. NO portray the benefits to health, management and monitoring of actions implemented to infected individuals, contacts and the population.

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