Assistance technologies for nursing care in maintaining the potential organ donor: an integrative literature review

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ABSTRACT

Objective: To identify in the literature the scientific evidence about the technologies for nursing care in maintaining the potential organ donor. Methodology: This is an integrative literature review, with the following acronym / PICo strategy: What technologies are being produced and / or used for nursing professionals in maintaining the potential organ donor? Conducted in the databases BDENF, LILACS, MEDLINE/PUBMED and SciELO, the time frame comprised the period 1997 - 2022, in Portuguese, English and Spanish. The descriptors (Decs/ MESH) were used: Technology, Technology Applied to Health Care; Nursing Care; Nursing professionals, Organ Donor; Tissue donors, Critical care; Systematization of Nursing Care; Brain Death, combined with each other using the Boolean operators AND and OR. Results: 07 articles were found, and after applying the inclusion and exclusion criteria, only 01 sample was obtained. From the sample of selected studies, a Conceptual Theoretical Model of Health Technology (Assistive Technology-TA) was formulated, focusing on the potential organ donor. With this article it was possible to highlight the technology aimed at assisting in decision making (Assistive Technology-TA). Conclusion: It was concluded that assistive technology is an important tool to assist the professional in the introduction of subjects, also serving as a source of consultation in times of doubt. With the continuous use of the proposed technology, there may be an improvement in the care of the potential donor and, consequently, help to reduce the gap between supply and demand for organs, providing an increase in the number of brain death notifications, improvement in the maintenance of the PD individual and, aiming at a secondary way, increasing the number of organ captures and transplants in the country. The scarcity of technologies on this subject is emphasized, which raises the need for the production of such technologies and the publication of studies on this subject.

Keywords: Technology Applied to Health Care, Nursing Care, Organ Donor, Critical Care, Systematization of Nursing Care, Brain Death.

1 INTRODUCTION

In the context of organ donation, the proper maintenance of the Potential Donor (PD) in brain death is crucial, providing essential and individualized care aiming at the viability of organs for transplants. In this process, the role of the Nursing team stands out, which is responsible for providing direct care to the PD and their families, being fundamental both in the management of the pathophysiological repercussions caused by Brain Death (BD), as in hemodynamic monitoring and in

the provision of individualized care, such as the control and recording of all hemodynamic parameters of the same (WESTPHAL et al. 2016; RAMOS et al. 2019).

There are 3 formulations of death by neurological criteria: total brain death, brainstem death and upper brain death. The "total brain death" and "brainstem death" formulations are both used today in different countries. Their clinical application generally leads to the same conclusion, differing only in the rare case of isolated primary pathology of the brainstem or posterior cerebral circulation (GREER et al, 2020).

BD is defined as the irreversible state of respiratory and circulatory functions and cessation of all activities of the encephalon and brainstem. It is related to increased intracranial pressure, decreased cerebral blood flow and hypoxia of brain tissue. The diagnosis of BD is regulated by Resolution No. 2,173/17 of the Federal Council of Medicine (CFM) (BRASIL, 2017a). The patient in brain death must present three cardinal signs: cessation of brain and trunk functions, lack of response to stimuli or coma and apnea (KUMAR, 2016).

According to Knihs et al (2019), there is a considerable loss of potential donors, both in Brazil and in other countries, due to several issues related to the fragility of the health team in conducting the EM process, especially issues related to the maintenance of these individuals. Thus, it is essential to develop educational strategies aimed at the intensive care health team, especially the Nursing team, with regard to improving activities regarding the maintenance of the PD.

In a study developed by Cavalcante et al (2014), nurses reported that care for potential organ donor patients is permeated by many activities, which configures a complex, multidimensional and multidisciplinary process, being complementary and interdependent. Based on the reports of the research subjects, there is a pressing need for differentiated care for the patient in BD, with all the technological support and scientific knowledge. Thus, nurses occupy an important place in the organ transplant team and should be trained to initiate the donation process, which includes, among other procedures, identification, notification of the donor to the intra-hospital donation coordination team, monitoring and maintenance of this type of patient, in addition to welcoming and caring for the family of the potential organ donor patient. (CAVALCANTE, et al 2014).

Costa, Costa and Aguiar (2016), cite that for an adequate management of potential donors, it is essential that there is the development of the clinical reasoning of the Nursing professional, and the same can be supported, by several technological resources, for the development and implementation of Care Plan consistent with the peculiar needs of each patient, in its pathophysiological process of morbidity, therapeutic, family and death.

The human condition and its finitude is indisputable, as everyone is born, lives and dies. Thus, life and death are considered as two inseparable and distinct processes of human existence, which are mediated by situations of daily confrontation, where nurses have difficulties in dealing with the

unknown, vulnerability, the daily fear of fighting the reality of death. In this sense, finitude means temporality, because experiencing the process of living and dying, in the condition of vulnerability is part of the human experience, that is, every living being is subjected to the devastating effects of time, which would make it somehow aware of its temporality in the world. (VIRGINIO, et al. 2014).

Thus, the ontological dimension of care in the face of finitude in the process of organ donation and procurement are the qualitative variations, degrees or directions, in which nursing care manifests itself or can be conducted by nurses when faced with the situation of vulnerability experienced by potential donors and their families, leading them to experience a dialectic in their praxis. The dialectic is in the fact that the nurse, in the professional action, has to articulate the rationality in the act of donation and capture, and understand its importance as a possibility of saving or increasing the survival of patients with organic failures and dealing with the feelings, beliefs and values of the family of a potential donor. (VIRGINIO, et al. 2014).

With the advent of the internet, mobile network and its greater ease of access, it has culminated in a growing expansion of the use and implementation of technological tools in various areas of work, and one of them is in health services. Through them, new teaching, learning and assistance instruments have been gaining new guises, giving greater reach and agility in the work process, can be cited as examples the use of virtual spaces for teaching classes and even the use of mobile devices, which are easily accessible and simple to manipulate (CHIOSSI; COSTA, 2018).

RÊGO, et al (2014) state that it is necessary to use, or apply, a Technology that favors the understanding of the concept and the development of the work process of the nurse inserted in the context of the Systematization of Care. In view of this, health technologies express new ways of producing it. Anchored in creativity, they are developed from the demands of reality and can be subdivided into three categories: light, light-hard and hard (MERHY, 2005).

Health has been favored, with technological advances, by the various types of technologies used, ranging from relationship management, user and family care, acquired knowledge, theories and professional interventions, to high quality and precision equipment, which contribute effectively and safely in patient care (MERHY, 2005).

In this perspective, this study aims to identify in the literature the technologies aimed at nursing care in the maintenance of potential organ donors.

2 METHODOLOGY

This is an Integrative Literature Review (ILR) study, which corresponds to the survey of scientific evidence on a given topic, synthesizing it to clarify doubts, contribute to decision making, express gaps and qualify professional practice through the translation of knowledge (MENDES; SILVEIRA; GALVÃO, 2008). The integrative review determines the current knowledge on a specific

theme, since it is conducted in order to identify, analyze and synthesize results of independent studies on the same subject (MENDES; SILVEIRA; GALVÃO, 2008).

To compose the review, six steps were taken: 1 - Definition of the review question; 2 - Search and selection of primary studies; 3 - extraction of data from primary studies; 4 - critical evaluation of primary studies; 5 - Synthesis of the review results; 6 - presentation of the review (MENDES; SILVEIRA; GALVÃO, 2008).

In step 1, the research question was guided by the mnemonic and based on the PICo strategy (WHA, 2014), in which nursing professionals figure as population (P), Technologies, as intervention (I), organ donor, as context, resulting in the question: *What Technologies are being produced and/or used (I) for nursing professionals (P) in the maintenance of the potential organ donor (Co)?*

Chart 1- Search strategy using PICo.

P	I	Co
'Nursing professionals'OR "Nursing care"	Technology (as) OR "Technology(s) Applied to Health Care"	"Organ donor" OR "Tissue donor"

Source: Prepared by the authors. Brazil, 2022.

In the second stage, the search was carried out from January to July 2022, simultaneously by two independent researchers, from different devices in the indexed databases of the CAPES Journals Portal, through the remote access of the Federated Academic Community (CAFe) and through the Virtual Health Library Portal (VHL) where the Scientific Electronic Library Online (SciELO), Latin American and Caribbean Literature in Health Sciences (LILACS), in addition to the Nursing Database (BDENF), Medical Literature Analysis and Retrieval System Online (MEDLINE)/PUBMED were accessed.

The controlled Health Descriptors (DeCS/MeSH) used were: Technology, Technology Applied to Health Care; Nursing Care; Nursing Professionals, Organ Donor; Tissue Donors, Critical Care; Systematization of Nursing Care; Brain Death associated with the Boolean operator AND and OR for crossing between the controlled descriptors that were adapted according to the specificity of each database.

We included primary studies available online in full, published in English, Portuguese and Spanish from 1997 onwards, which coincides with the legal framework of soft-hard technology in nursing practice.

Table 2- Search strategy in the databases.

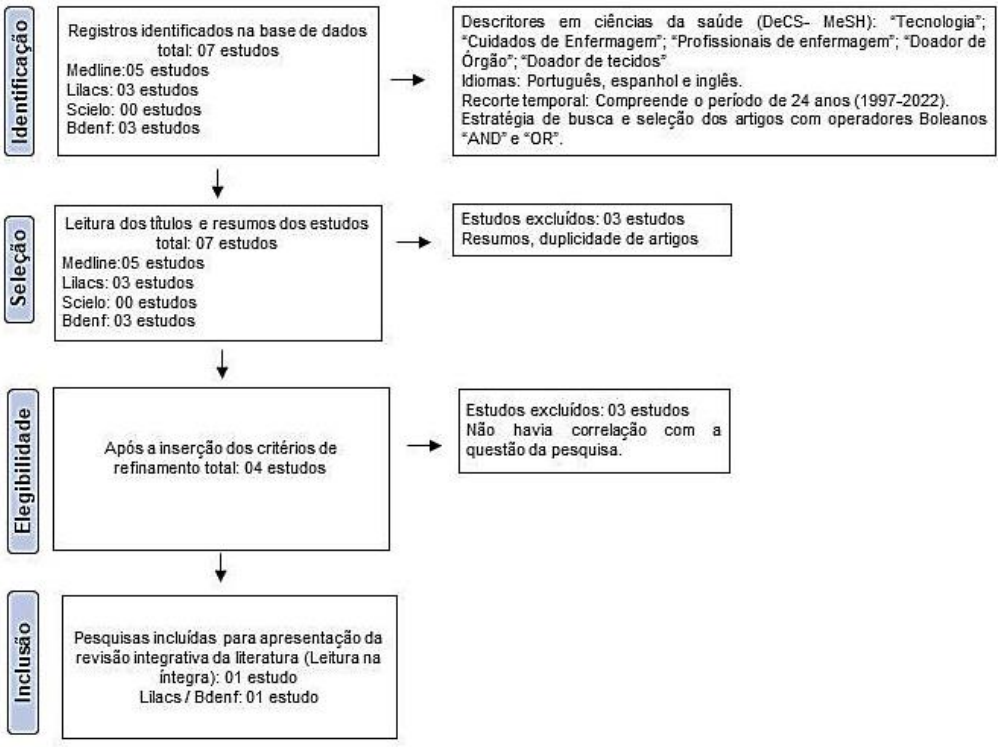
DATABASES	STRATEGIES	Results
Virtual Health Library Portal -BVS	(technology) AND (organ donor) AND (nursing care)	07
Latin American and Caribbean Literature in Health Sciences (LILACS)	(technology) AND (organ donor) AND (nursing care) AND (db:("LILACS"))	03
Nursing Database (BDENF)	(technology) AND (organ donor) AND (nursing care) AND (db:("BDENF" OR "LILACS"))	03
Scientific Electronic Library Online (ScIELO)	(technology) AND (organ donor) AND (nursing care)	00
Medical Literature Analysis and Retrieval System Online (MEDLINE)/PUBMED.	(technology) AND (organ donor) AND (nursing care)	05

Source: Prepared by the authors. Brazil, 2022.

The references were organized in Microsoft Excel® 2013 and duplicates removed, and studies that did not address the theme were excluded. The extraction of results was based on the *PRISMA-ScR* flow diagram, where relevant articles on technologies for nursing care in the maintenance of potential organ donors were considered eligible and initially selected for the presentation of results based on a dynamic reading, based on the information provided in the title and abstract, by two independent researchers.

After dynamic reading of the title and abstracts, the pairs independently selected the articles and documents for full reading. there was consensus among the pairs as to the study chosen for the review in accordance with the eligibility criteria. The cases of impasses were resolved through dialog and discussion between the researchers and there was no need for a third researcher.

Figure 1: Flowchart of the article selection process, according to databases using descriptors and Boolean operators with eligibility criteria - *PRISMA-ScR flowchart.*



Source: Prepared by the authors, Brazil, 2022.

3 RESULTS AND DISCUSSION

Some relevant information and data extraction from the article follows, such as: title, authors, country of publication, database, year, language, research design, study typology, degree of recommendation, level of evidence, objective, result, technology produced and conclusion.

The analysis of the study in relation to the research design was based on Polit, Beck, Hungler (2004) and Lo Biondo-Wood, Haber (2001), and both the analysis and the synthesis of the data extracted from the article was carried out in a descriptive way, making it possible to observe, count, describe and classify the data, in order to gather the knowledge produced on the topic explored in the review as below.

From the initial search, 07 studies were obtained, resulting in only 01 for the composition of the final sample (14.2%) (fig1).

The selected study is entitled: Application-guide for maintenance of the potential pediatric donor, written by the author Vanda Aparecida Tolari, published in the Nursing Database BDENF and concomitantly in the Latin American and Caribbean Literature in Health Sciences - LILACS, published as a Doctoral Thesis in 2019, in Portuguese, in Brazil.

Characterized as a systematic review, the main method of evidence synthesis, used in the evaluation of a set of data from different studies, which aims to search for all evidence that fits the pre-defined eligibility criteria, with the objective of answering a specific question, providing more reliable data with which conclusions can be made and decisions made.

This study is graded as recommendation grade B and classified with evidence level 2. According to the Oxford Centre for Evidence-Based Medicine classification (2001) studies are graded as recommendation grade A for those with evidence level 1A, 1B and 1C, recommendation grade B for those with evidence level 2A, 2B, 2C, 3A and 3B; recommendation grade C for those with evidence level 4; and recommendation grade D for those with evidence level 5.

We can also outline this article as type V - systematic review of descriptive and qualitative studies, of the methodological type that aims at the interpretation and analysis of phenomena, the investigation of methods for data collection and organization, and validation of instruments used in the research. This classification was adopted by the proposal by Melnyk and Fineout-Overholt (2011), which organizes and categorizes research into 7 levels, where 1 is the level of greatest evidence: I- systematic reviews; meta-analysis; randomized controlled clinical trials; clinical guidelines based on systematic reviews of randomized controlled clinical trials. II- at least one well-designed randomized controlled trial; III- well-designed clinical trial without randomization; IV- well-designed cohort study, case-control study; V- systematic review of descriptive and qualitative studies; VI- single descriptive or qualitative study; VII- opinion of authorities, report of expert committees. This classification has an

increasing evidence rating, with I being the strongest level, and the closer to level VII, the weaker the evidence.

The research studied aimed to develop a mobile app to guide nursing care for children in suspected brain death and potential pediatric donors.

The nurse occupies an important place in this care, in this organ transplant team, and should be and be trained for the monitoring and maintenance of the potential donor, in addition to welcoming and caring for the patient's family. Facilitating this care and supporting nurses in the care process is one of the gaps that need to be filled in the scope of nursing care.

The main result was the construction of a Guide Application, whose content was elaborated from the cross-mapping of the selected indicators: basic human needs, resulting from pathophysiological changes and those perceived in the clinical evaluation, with the Nursing Diagnoses, according to the NANDA-I taxonomy and Nursing Interventions selected from the diagnoses, from the perspective of maintaining the permeability of organs and tissues to be donated. The technology produced as a final product was the guide application.

Concluding that the construction of this guide application for nursing care to maintain the potential organ donor in suspected brain death and the potential pediatric donor, from before the opening of the protocol to the effectiveness of the donation or not, will subsidize the nurse in the planning of care; in the development of the Nursing Process, favoring the clinical reasoning of the nurse, in order to keep the organs viable for transplantation.

It is realized that it is an innovative technology that predicts impact in the health area, and that the study brings theoretical, normative, regulatory knowledge and, from the professional practice of the researcher, while working in the Intra-hospital Commission for the Donation of Organs and Tissues. It is highlighted by the author that nursing has been engaged in the production, elaboration and validation of educational technology, as it observes that the possibility of offering and instrumentalizing permanent education (ROSA, 2015).

An ET can be configured in a process or product, something material or not. Its objective is to facilitate learning, provide social inclusion, respect rights and improve living conditions by fostering individual autonomy (MEDEIROS, SILVA, 2016; ÁFIO et al., 2014).

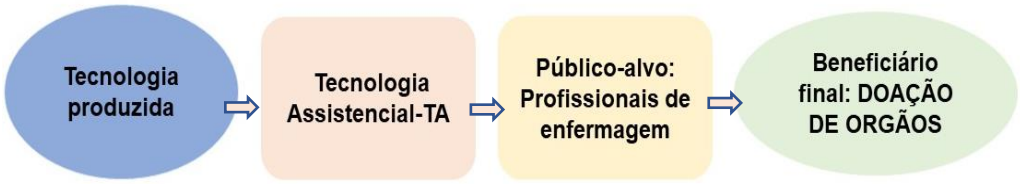
The nurse is considered a component of the multiprofessional team, a facilitator of knowledge and with scientific training capable of collaborating positively in the process of elaboration and evaluation of educational technologies aimed at promoting care.

The search strategies revealed TEs aimed at the population, however, not many studies were found that addressed the theme of *Technologies produced and/or used (I) for nursing professionals (P) in maintaining the potential organ donor (Co)?*

Only one study approached the theme, denoting the gap in knowledge regarding the object of this study, as well as presenting itself as a limiting factor of this research. This fact corroborates the need for the production of technologies and publications on the proposed theme.

Therefore, after analyzing this article, a conceptual theoretical model was formulated, regarding the type of technology and targeting the target audience (Figure 2).

Figure 2 - Theoretical Conceptual Model of Health Technology (Assistive Technology-TA), focusing on the potential organ donor.



From the development of the conceptual model, expressed in Figure 2, it is evidenced through the perception of the authors that it is necessary to conceptualize **brain death and know its clinical concept, as well as the determination of brain death by neurological criteria. The assistance technology for maintenance of the Potential Donor-PD** was developed for health professionals (**nursing assistance in the maintenance of the PD)** being the child the indirect target audience, with no intention of evaluating the right or wrong, as to the direction of technologies, but only to make a parallel.

This technology becomes of great importance to these professionals, since it presents itself as instruments of information, possibility of expanded care and changes in their attitudes. The basis of technology lies in knowledge, technique and experience. It is through this set that new technologies must be created and that gradually transform evidence-based practice.

4 FINAL CONSIDERATIONS

Care technologies are strategic tools and are important allies in the practice of health professionals. Through them, it is possible to adopt strategies that enhance care, either for health promotion or for disease prevention. However, considering the criteria adopted in this review, there was a shortage of educational technologies aimed at caring for children with congenital heart disease.

The advantages of the insertion of technologies are notorious in all areas, including health, an area in which technological resources must be well employed and widely used. Of the technologies revealed, those of care predominated, a fact that makes it notorious that discussing technology is not discussing equipment or the modern and the new, but discussing the effective procedure of certain knowledge, thus seeking to build intervention procedures in the processes of health and disease, normal and pathological, life and death, which produce the desired effect.

In this context, the present study continued, analyzing the technologies found to highlight this gap and foster future publications on the subject. Therefore, it is hoped that this work can mitigate the production and publication of future articles for greater visibility on the proposed theme.

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