Digital technologies in water education in the pespective of nursing graduates in pandemic COVID-19

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ABSTRACT
The pandemic of covid-19 required that all sectors of society had to transform themselves, including the school as an integral part of this social environment was one of the most affected spheres in this new scenario. The study aims to search the scientific literature for data on the use of digital technologies in hybrid teaching from the perspective of undergraduate nursing students in the covid-19 pandemic. This is an integrative literature review. The databases used were LILACS, BDENF via VHL. Medline via PubMed and SciELO portal. Inclusion criteria were: original articles available in full that addressed the theme. Opinion articles, duplicates, abstracts, dissertations, theses, letters to the editor, and review studies were excluded. Ten studies were selected to compose the sample. It was evident that nursing students, through hybrid teaching and through digital technologies, were satisfied with the methodologies implemented, adapting favorably to the social context in which they were included. It was noticed that hybrid teaching during the Covid-19 pandemic is a viable methodology in the teaching-learning process of nursing students, since the student becomes autonomous and responsible in an important part for his own learning, in addition to expanding the digital inclusion of all those involved.

Keywords: Distance Learning, Nursing, Covid-19, Information Technology.

1 INTRODUCTION

The covid-19 pandemic required that all sectors of society had to transform, including the school as an integral part of this social environment, it was one of the spheres hardest hit in this new scenario. Everything we knew as education professionals, whether in the process of training or carrying out teaching work, needed to be reviewed, analyzed and rediscussed (VIEIRA et al., 2020).

Still in the first months of 2020 after the spread of the virus and with the first cases being recorded on Brazilian soil, one of the government measures to contain the disease was to close spaces that gathered large numbers of people. Schools across the country had their face-to-face activities interrupted and students of all levels of education had to paralyze their student process in an attempt to curb the process of infection and transmission of the new virus (SANTOS; OLIVEIRA, 2021).

Long before the pandemic, in 1998, Libâneo already pointed to the importance of using new information and communication technologies in the context of the classroom, since society experiences constant technological, political, economic, social and cultural transformations. In a globalized, transnational world, our students need to be prepared for a critical reading of the transformations taking place on a world scale. In a world of intense scientific and technological transformations, they need a solid general formation, capable of helping them in their ability to think scientifically, to scientifically pose human problems (LIBÂNEO, 1998). The lessons that the pandemic has brought to education

professionals who are forced to work entirely online due to the temporary closure of schools, to avoid the health risk represented by crowds, are pointed out by education theorists (DEMERVAL, 2020).

In this historical period in which technology is in an increasingly accelerated growth we find the need to follow this movement and use this technology also in favor of teaching and enjoy its benefits so that it enables a better form of learning. In this current moment, when everything is very accelerated and time seems much scarcer, the use of this technological tool can be of great value both for those who dedicate themselves only to studies, as well as especially to those who want to study, but develop other roles that hinder this task (JUNIOR; MONTEIRO, 2020).

For Neto (2018), technology has joined traditional teaching to change the way subjects are exposed and, in this way, reach this new generation, and the changes that have been happening with the advancement and growing use of technology, an important factor in the emergence also, in the need to innovate active teaching methodologies, Because only traditional education does not serve this generation surrounded by technological innovations, so it is necessary to take advantage of these technologies so that the student feels attracted to seek knowledge.

Blended learning has been one of the alternatives for this innovation to happen. It is a teaching modality that merges online teaching with traditional teaching, bringing the advantages of these two spaces. Its use provides students with access to content in different environments, the sharing of ideas with groups, autonomy and problem solving, becoming active agents in the construction of knowledge (BACICH; GRANDSON; TREVISANI, 2015).

 Thinking about teaching, especially higher education, is essential since, we live in a period where students are connected and the "teaching" and "giving" class, requires teachers to rethink education, its methodologies and the use of digital technologies and how to use these resources in favor of learning, in favor of the constitution of new knowledge, creating a model that delights, motivates connected students (LIMA, 2020).

Within this new context brought from the pandemic, technologies are configured as important tools capable of enabling the continuity of the teaching and learning process, however, it is not enough just to theorize, it is necessary to program a conscious construction of this technological aspect. It is necessary to reflect on how they will be effected in practice, think about the challenges that will be encountered and seek solutions that aim to facilitate the day to day of both the educator and the student (CO; AMORIM; FINARDI, 2020).

The study aims to search the scientific literature for data on the use of digital technologies in hybrid education from the perspective of nursing undergraduates in the covid-19 pandemic.

2 METHODS

This methodology consists of an integrative literature review. This type of research is defined as a search for relevant studies on a given theme, which makes it possible to discuss and evidence facts, identifying gaps that can influence the performance of new research, enabling a critical evaluation and synthesis of data in its final product (MOWBRAY; WILKINSON; TSE, 2015).

The integrative review follows the following steps: identification of the theme and formulation of the guiding question of the research; establishment of exclusion criteria and inclusion of studies to compose the sample; data collection; critical analysis of the selected studies; interpretation of results; presentation of the synthesis of information and review of data (MENDES; SCOTT; GALVÃO, 2008).

Thus, the use of the PICo strategy was determined, which represents an acromion, where (P) refers to the population (nursing undergraduates), (I) intervention (Use of digital technologies) and (Co) context (covid-19 pandemic). These elements guided the elaboration of the following guiding question: "What digital technologies were used during the covid-19 pandemic in hybrid education from the perspective of nursing students?".

The period of this investigation covers the interval between August 2021 and December 2022. In the following databases: Latin American and Caribbean Literature in Health Sciences (LILACS), Nursing Database (BDENF) via Virtual Health Library (VHL), Online System for Search and Analysis of Medical Literature (MEDLINE) via PubMed and the portal of the Online Scientific Electronic Library (SCIELO), using the Boolean operators AND AND OR. In Portuguese, English and Spanish. With the following descriptors: "Distance Learning", "Nursing", "Covid-19 Pandemic" and "Information Technologies".

The following inclusion criteria were established: original articles available in full that addressed the theme. Opinion articles, duplicates, abstracts, dissertations, theses, letters to the editor and review studies were excluded.

The descriptors used were organized according to the following Boolean operators: [(Distance Learning) AND (Nursing) AND (Covid-19) AND (Information Technologies)]; [(Nursing) AND (Covid-19) AND (Information Technologies)]; [(((Distance Learning) AND (Nursing)) AND (Covid-19)) AND (Information Technology))] and [(Nursing)) AND (Covid-19)) AND (Information Technology)], selected according to the descriptors (DeCS/MeSH) specifying for each database.

After the initial screening, a result of 726 studies was obtained as a sum of all databases, of which 136 came from the VHL and 579 from Pubmed and 11 from the SciELO portal. After applying the eligibility criteria, 716 studies were excluded, 359 were review studies. After reading the titles, 300 did not refer to the theme. 57 studies were selected to read the abstracts, after this stage 47 were excluded and 10 were selected to compose the sample of this study, after the complete reading.

In the analysis process, the data related to the authors, title, methods, results and conclusions were established. To elaborate the flowchart for the selection of studies, an adaptation of the *Preferred Reporting Items For Systematic And Meta-Analyses* (PRISMA) was performed.

Figure 1. Study selection flowchart adapted from the *Preferred Reporting Items For Systematic And Meta-Analyses* (PRISMA).
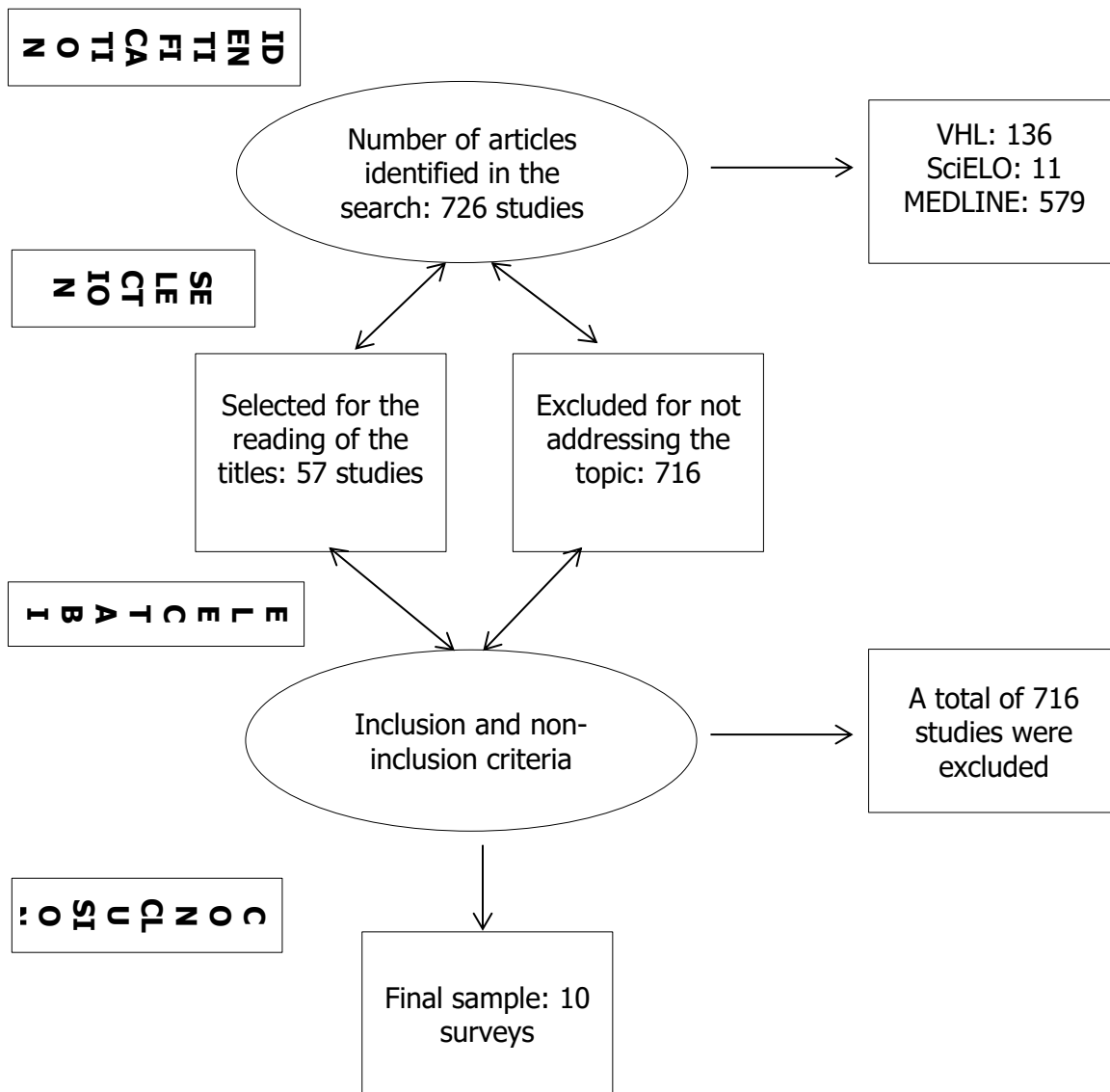
Source: Own authorship (2023).

Table 1. Search strategy in the databases from the DeCS/MeSH.

DATABASES	
PubMed/MEDLINE	(((Distance Learning) AND (Nursing)) AND (Covid-19)) AND (Information Technology) (Nursing)) AND (Covid-19)) AND (Information Technology)
LILACS/BDENF	(Distance Learning) AND (Nursing) AND (Covid-19) AND (Information Technology) (Nursing) AND (Covid-19) AND (Information Technology)
SciELO	(Distance Learning) AND (Covid-19) AND (Nursing) (Nursing) AND (Covid-19) AND (Information Technology)

Source: Own authorship (2023).

3 FINDINGS

The sample consisted of 10 studies, which were organized according to title, author, type of study, objectives and results, and conclusion, as shown in Chart 2.

Table *2* - Articles used in the construction of the research

AUTHOR/YEAR	TITLE	METHODOLOGY	GOAL	MAIN FINDINGS
FRONZA, D.S et al. (2020)	Teaching possibilities in the context of the Pandemic.	Qualitative study, through analysis of reports	Make an analysis of the results of some activities developed in this teaching context.	Due to the suspension of face-to-face classes, strategies were designed and implemented in order to guarantee access to education for all. The adaptations were a challenge to managers, educators and undergraduates, who often faced great difficulties in learning.
NECKLACES, M. S. S. (2020)	Advantages and disadvantages of blended learning in the post-pandemic: discursive and enunciative event	Field study focusing on educational discourses	To understand the modalization of blended learning in the context of the Covid-19 pandemic.	We analyze the enunciative excerpts identified in the advantages and disadvantages of blended learning in the pandemic; we understand that teachers and students have had to reinvent home office activities in a practice of online classes.
Christoffers, C. (2022).	Practical Implications of Online Learning with Nurses during COVID-19	Descriptive study	This study explores how teaching practices have been impacted by coronavirus disease 2019 (COVID-19) in a fully online nursing program.	The results of the study suggest that the COVID-19 pandemic was challenging for faculty, but they still considered it an opportunity for personal and professional growth.
JEON, E. et al. (2021)	Emergency remote learning in nursing education during the COVID-19 pandemic	Descriptive study	This study aims to understand the status of Emergency Remote Learning.	The results of the study show that during the two semesters, university nursing professors have adapted well to this unprecedented teaching crisis.

ALMHDAWI, Khader A. et al. (2021)	Healthcare students' mental and physical well-being during the COVID-19 lockdown and distance learning.	Cross-sectional study with a self-administered questionnaire.	This study aimed to investigate the situation of university students in the health area and its predictors during COVID-19.	This study showed that health students had a relatively high level during the COVID-19 pandemic
BESTER, P. et al. (2021)	When online learning becomes compulsory: Student nurses' adoption of information communication technology in a private nursing education institution	This is a descriptive, qualitative and exploratory study.	Explore the barriers and facilitators to the adoption of ICT by a diverse group of nursing students in a private nursing education institution	The integration of ICT in nursing programs is important. The facilitators and barriers to ICT are described. Expose students to different technologies, especially using smartphones to search for information (academic/non-academic).
MCNABB, S. JN et al. (2021)	Delivering modern global health learning requires new obligations and approaches.	Descriptive study	We describe a set of multicommunication methods, e-Learning principles, ICT strategies and approaches for educators to streamline content delivery from traditional F2F classroom didactics to the modern era	We offer a vision, a set of guiding principles, and five strategies for delivering successful curricula in the modern era, so that global health training can be made available to a wider audience more efficiently and effectively.
AYHAN, D; SEKI ÖZ, H. (2021).	Effect of assertiveness training on the nursing students' assertiveness and self-esteem levels: Application of hybrid education in COVID-19 pandemic	Experimental study with control group	To assess whether assertiveness training offered through a hybrid education model had any effect on assertiveness and self-esteem	Technology-based hybrid assertiveness training has been shown to be effective in increasing undergraduates' assertiveness.
YOO, H. Jin; LEE, H. (2022).	Critical role of information and communication technology in nursing during the COVID-19 pandemic: A qualitative study	Qualitative descriptive study	Examine the need for information and communication technology (ICT)-based nursing care	The use of information technologies during the training of these undergraduates has become effective.
EVANS, D. JR (2022).	Has pedagogy, technology, and Covid-19 killed the face-to-face lecture?	Qualitative descriptive study	Examine the influence of digital technologies on face-to-face practice	It was found a forgetfulness of the methodologies implemented in face-to-face environments by digital teaching technologies

Source: Prepared by the authors (2023).

4 DISCUSSION

In the studies of Chistoffers (2022), they show that nursing undergraduates, through hybrid teaching, depend on their responsibilities, as this methodology presents greater flexibility and freedom

to access the content available on the virtual platform. This guarantees nursing students autonomy through a more proactive and critical posture, committed to their education and the type of professional they aspire to be.

The use of digital technologies in blended learning during the covid-19 pandemic has shown some benefits. For Jeon et al (2021), this type of teaching provides the opportunity to build one's own schedule and student planning, establishing preferences and schedules that best suit their needs, to ensure a better use of the content taught.

The use of blended learning is an incentive for nursing students during the covid-19 pandemic. In the research of Almhdawi et al (2021) demonstrates that hybrid teaching encourages nursing students to be protagonists of their own education, no longer being passive recipients of fractional subjects. Thus, this is another of the numerous innovative advantages of this model because they can access classes from any place or time, assimilating the content, solving the exercises individually, taking their doubts with the guidance of the teacher and applying what they learned in the classroom, as well as participating in events previously unavailable due to distances.

The use of technologies associated with hybrid education has been characterized as an important factor in the formation of undergraduate students. In the studies of Bester et al (2021) it is reported that activities such as virtual debates, simulations among others, are part of a permanent evaluation process and corroborate that knowledge is not static, however, it is the result of an individualized construction and divided with the group. For Mcnabb et al (2021) the assimilation of content is more propagated, since we have the help of many research tools, and the content is in our hands. Therefore, each one can be interested in a certain aspect to the detriment of another, deepening what is in their interest. The classes, in this approach, become more participatory, and not as expository, as in traditional teaching.

In order for this change to be effective, Ayhan and Seki (2021), affirm that the training of nursing students becomes a basic premise, to accept that the world has evolved and to welcome new technologies as facilitators of the educational process. Therefore, it needs to rebuild its pedagogical practice, be creative, a motivator in the classroom, aiming that future professionals can have their quality training assured.

Amid the adaptation required in times of pandemic, many actions had to be taken. According to Fronza et al (2020), The applications developed within the universities, by the professors themselves, associated with the Nursing curriculum and supported by intercollaboration with students, are better suited to educational practices by structuring a more favorable and attractive environment, enhancing and facilitating engagement in these actions, favoring satisfaction with teaching by undergraduates.

By using digital technologies in the teaching-learning process around nursing, professors are innovating in the relationship between teaching and learning, as they adapt to the need for current educational models. In this perspective, the undergraduates follow this renewal, using virtual environments, making interactivity favorable and favoring the learning process (YAOO; LEE, 2022).

In this sense, Colares (2020) report that the inclusion of digital technologies in undergraduate nursing courses reserves to the student the leading role in learning, in addition to increasing the level of digital inclusion of those involved, making the process more dynamic and motivating. Demonstrating that the visibility of use in situations that make direct contact with the teacher unfeasible, such as performing activities in the home environment, developing actions in the community and periods of remote classes.

Thus, the help of technology was a crucial factor in the students' learning during graduation. For Evans (2022), technologies can be effective to be seen as innovative tools in teaching in Nursing, presenting themselves as tools capable of arousing interest and motivation in learning, given that digital technologies are used in a proportion between 45% and 85% more than consultations to books and magazines.

So, Para Colares (2020) nursing undergraduates in their perspectives associate the use of digital technologies with a better assimilation of content and ease of learning, which culminates in the training of better professionals, even going through the limitations of the covid-19 pandemic.

The referred research presented some limitations, the main one being the little association of the number of studies with the objective of the research, which is evidenced in the methodological part of the research.

5 CONCLUSION

It was perceived that hybrid teaching during the Covid-19 pandemic is a viable methodology in the teaching-learning process of nursing students, since the student becomes autonomous and responsible in important part for their own learning, in addition to expanding the digital inclusion of all those involved. In addition, this teaching methodology provides the breaking of barriers about the education of undergraduate nursing students and contributes to reduce geographical distances. From the perspective of the undergraduate, hybrid education also contributes to meet their didactic deficiencies and deficits in educational materials.

In addition, it is necessary to develop new research that highlights the perspective of undergraduates being submitted to hybrid teaching and digital technologies in the covid-19 pandemic. This research serves as a basis and incentive for the construction of new studies on this theme.

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