SEVEN
publicações acadêmicas

NURSING WORK FROM THE PERSPECTIVE OF CLINIC MANAGEMENT: CO-CREATION OF ARTIFACTS WITH DESIGN THINKING

TRABALHO DE ENFERMAGEM NA PERSPECTIVA DA GESTÃO DA CLÍNICA: COCRIAÇÃO DE ARTEFATOS COM DESIGN THINKING

EL TRABAJO DE ENFERMERÍA DESDE LA PERSPECTIVA DE LA GESTIÓN CLÍNICA: CO-CREACIÓN DE ARTEFACTOS CON DESIGN THINKING

https://doi.org/10.56238/sevened2025.031-043

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ABSTRACT

Introduction: The Clinic Management model, created in Brazil by Eugenio Vilaça Mendes, has as its basic premise the creation of a set of clinic micromanagement technologies to provide quality healthcare. This model was adopted by the Brazilian Hospital Services Company (EBSERH), which manages hospitals.

Objective: The objective of this study was to contribute to the implementation of clinic management principles in one of the EBSERH university hospitals through the ideation and co-creation of artifacts, using the Design Thinking (DT) approach.

Method: The method used in this study was an experience report in which the DT phases were experienced with nursing professionals from various hospital units, to co-create solutions to address the identified problem—deficiencies in the process of developing and implementing nursing schedules.

Results: The participants co-created three artifacts to assist in the scheduling process: pre-schedule implementation; drafting a notice for internal staff reassignment and creating a new process for supervising nursing work.

Conclusion: We conclude that the characteristics of the Design Thinking approach respond favorably to the implementation of clinical management principles. The emergence of desirable, feasible, applicable, and sustainable solutions to address the problems of the university hospital setting opens a series of opportunities for further research.

Keywords: Clinic Management. Nursing Work. Design Thinking.

RESUMO

Introdução: O modelo de Gestão da Clínica, criado no Brasil por Eugenio Vilaça Mendes, tem como premissa básica, reunir um conjunto de tecnologias de microgestão da clínica, de

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forma a prover uma atenção à saúde de qualidade. Esse modelo foi adotado pela Empresa Brasileira de Serviços Hospitalares-EBSERH, a qual administra os hospitais hospitalares.

Objetivo: O objetivo do presente estudo foi contribuir na implementação de princípios da gestão da clínica em um dos hospitais universitários da gestão EBSERH, por meio da ideação e cocriação de artefatos, utilizando a abordagem do Design Thinking-DT.

Método: O método utilizado no presente estudo foi um relato de experiência em que foram vivenciadas as fases do DT com profissionais de enfermagem de diversas unidades do hospital, para cocriação de soluções a fim de atenderem o problema elencado – deficiência no processo de elaboração e execução das escalas da enfermagem.

Resultados: Como resultados foram cocriados pelos participantes três artefatos para auxiliarem nos processos de escalas, quais sejam: realização de escala prévia; elaboração de edital de remanejamento interno de pessoal e criação de novo processo para supervisão do trabalho em enfermagem.

Conclusão: Concluímos que as características da abordagem do Design Thinking respondem favoravelmente à implantação dos princípios da gestão da clínica. A emergência por soluções desejáveis, factíveis, aplicáveis e sustentáveis para lidar com os problemas do cenário hospitalar universitário, abre uma série de oportunidades para novas pesquisas.

Palavras-chave: Gestão da Clínica. Trabalho em Enfermagem. Design Thinking.

RESUMEN

Introducción: El modelo de Gestión Clínica, creado en Brasil por Eugenio Vilaça Mendes, se basa en la creación de un conjunto de tecnologías de microgestión clínica para brindar atención médica de calidad. Este modelo fue adoptado por la Empresa Brasileña de Servicios Hospitalarios (EBSERH), entidad que gestiona hospitales.

Objetivo: El objetivo de este estudio fue contribuir a la implementación de los principios de gestión clínica en uno de los hospitales universitarios de la EBSERH mediante la ideación y cocreación de artefactos, utilizando el enfoque de Design Thinking (TD).

Método: El método utilizado en este estudio fue un informe de experiencia en el que se experimentaron las fases de TD con profesionales de enfermería de diversas unidades hospitalarias, para cocrear soluciones que abordaran el problema identificado: deficiencias en el proceso de desarrollo e implementación de horarios de enfermería.

Resultados: Los participantes cocrearon tres artefactos para facilitar el proceso de programación: implementación previa del horario; redacción de un aviso para la reasignación interna del personal y creación de un nuevo proceso para la supervisión del trabajo de enfermería.

Conclusión: Concluimos que las características del enfoque Design Thinking favorecen la implementación de los principios de gestión clínica. La aparición de soluciones deseables, factibles, aplicables y sostenibles para abordar los problemas del entorno hospitalario universitario abre nuevas oportunidades para futuras investigaciones.

Palabras clave: Gestión Clínica. Trabajo de Enfermería. Design Thinking.

1 INTRODUCTION

Considered as complex organizations, hospitals require strategic management models to ensure the promotion of health care services and the preservation of users' lives (BRISTOT et al., 2016). Thus, it is necessary that they be guided by assertive and purposeful management models.

The Brazilian Company of Hospital Services (EBSERH), which manages university hospitals, implemented the Clinic Management model in the hospitals that make up its network (EBSERH, 2018). Thus, it was up to each of these hospital organizations to implement the model, so that work practices are based on the principles that guide this management model. Eugênio Vilaça Mendes, was the creator of the Clinic Management model, and states that the basic premise is to bring together a set of clinic micromanagement technologies, in order to provide quality health care, especially in terms of the use of clinical guidelines that influence the decisions of health professionals (MENDES, 2011, p.369).

The above study aimed to contribute to the implementation of clinical management principles in the hospital, through the ideation and co-creation of artifacts, using the Design Thinking approach, which configures the collective participation of the actors involved in the process. The conception of artifact adopted here is the one addressed by the Argentine philosopher, Mario Bunge, who attributed the term "artifact" as a device that does not necessarily have to be an object or thing, but can deal with the transformation of something or a system (CUPANI, 2004).

Design Thinking is a methodological, exploratory, interactive, multiphase and non-linear approach, which consists of identifying a need, in order to generate solutions for society. This approach has been used as a method for the design of various artifacts (products, services, experiences, etc.), as well as in the generation of solutions to issues of other natures (social, environmental, among others) (BROWN, 2018; SOUZA, 2017). To the detriment of such characteristics, methodological approaches that use design naturally present difficult standardization in their design process, and tend to be customized, since their conception derives from a specific need; in addition to being naturally dynamic, since they undergo constant changes during the process, when dealing with problems that are not clearly defined, and supporting incipient ideas before becoming an artifact (BEST, 2012; SOUZA, 2017).

In practice, a problem is not understood in its entirety until the solution to it is designed, and therefore, both emerge together throughout the design process, and are clarified as the

project activities take place (MELLO, 2014). As it is a human-centered innovation process, *Design Thinking* uses the sensitivity and methods of design to solve different types of problems, such as observations, collaborative practices, visualization of ideas, prototyping, analysis of existing artifacts, involvement of *stakeholders* in an integrative process, among others; in order to imagine the future and develop artifacts (LOCKWOOD, 2010; SOUZA, 2017).

In this way, the approach allows constant learning and refinement, based on the alternation between divergent thinking (generation of ideas that allow expanding understanding and creating alternatives, seeking creative, bold, innovative results) and convergent (experimentation, refinement, and decision-making with a view to more specific solutions) (BROWN, 2018; BOSCHI, 2012; VIANNA et al., 2012). However, even if design methods help in the development of artifacts, the final result depends on the technical and creative capacity of those who design them (FREITAS; COUTINHO; WAETCHER, 2013), and it is important to consider in design thinking the design principles that underpin it, according to Brown (2010) and Souza (2017):

1) Immersion: human principle of the design process that considers people as a starting point, and, therefore, makes use of empathy to listen to stories and obtain insights about individuals and their surroundings, being necessary to immerse ourselves in the user's life and context to deeply understand their needs, desires, expectations and behaviors.

2) Collaboration: multidisciplinary principle of the design process that is characterized by the collaboration of different stakeholders throughout the process, related to the context of the user or the artifact in order to seek contributions from different backgrounds, skills, experiences, and points of view.

3) Ideation: creative principle of the design process characterized by the ideation of concepts and alternatives to solve the problem, and in this aspect, it aims to stimulate the creativity and collaboration of those involved in the co-creation of innovative ideas, centered on people's needs and that contribute to the resolution of specific issues through the artifact.

4) Visualization: **visual** principle of the *design* process that uses different structures to record, represent and communicate the findings obtained throughout the design process, which favors information, inspiration and the creation of a common point of view among the project participants, and helps the generation of ideas and experimentation of prototypes.

5) Experimentation: **an experimental** principle of the *design process* that consists of the natangibilization of ideas in prototypes of different levels of fidelity, through tangible resources and real or simulated situations, and, in this process of creating, testing and refining solutions, it is aimed at gaining the empathy of users, better understanding the context of use of the artifact, as well as identifying new needs and possibilities through *feedbacks*.

6) Interaction: **interactive** principle of the *design process*, characterized by moments of divergence, in which the largest number of solutions is created; and convergence, since it seeks, among the solutions, to choose the most relevant one for the problem; and, in this process, the desirability, feasibility and feasibility of the artifact are considered.

The clinic's management proposal presupposes a process of co-responsibility and contractualism, which is still not widespread in the current organizational culture, in which health professionals and managers compete for space rather than admit to living with the same problem (ACIOLE, 2012). In this sense, the production of data with *Design Thinking* presupposes collaborative activity, in which it is necessary to leave the limited vision of focusing only on individual perspectives, and start to consider collaborative activity, weighing the needs of the other actors under a single problem, so that they enter the process of ideation in favor of common solutions (ALT; PINHEIRO, 2011; BROWN, 2018).

Thus, the objective of the research reported here was to design artifacts for the qualification of nursing management processes in a university hospital.

2 METHODS

This is a descriptive study in the form of an experience report. This type of study, more than being a precise narration about a certain activity, makes it possible to know the described experience in depth, providing reflection on its content (GONZÁLEZ-CHORDÁ et al., 2015).

The experience to be reported took place at the Júlio Muller University Hospital, belonging to the EBSERH network, located in Cuiabá, Mato Grosso. More precisely, the scenario was composed of clinical, medical, surgical and pediatric hospitalization units, as well as neonatal and adult Intensive Care Units (ICU), managed by the Hospitalization Management Unit (UGI). The team included 21 participants, including 15 hospital employees and six residents of the Multiprofessional Residency Program in Hospital Management. Among the employees involved, the following participated: three nurses in leadership positions (Nursing Division, Inpatient Management Unit, and Outpatient Management Unit);

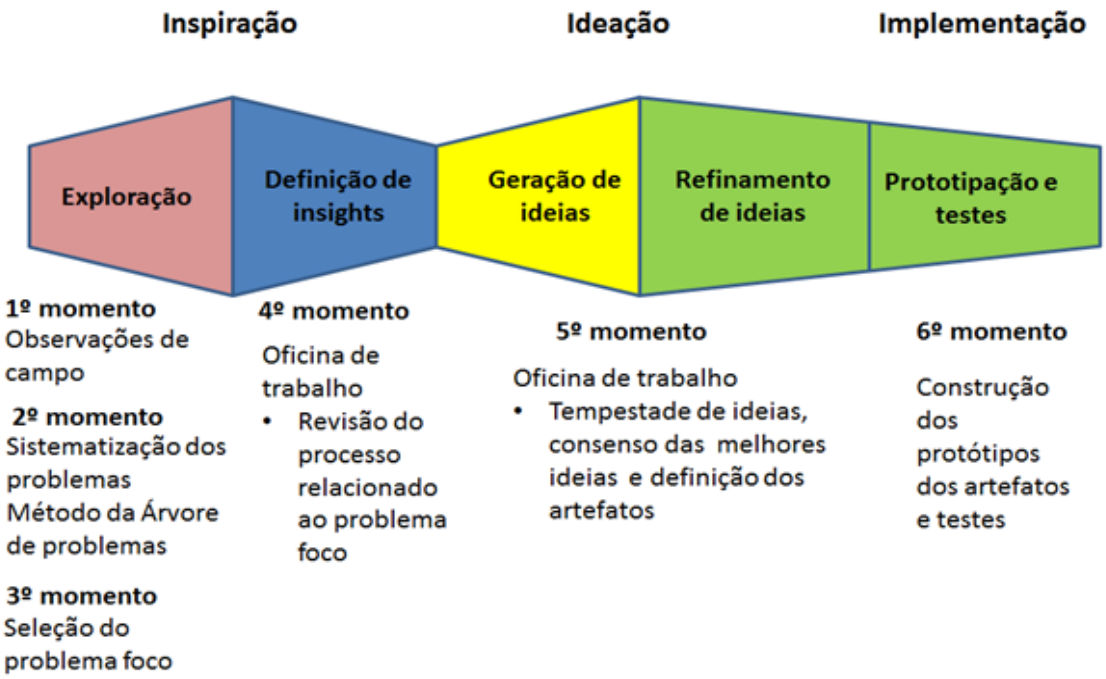
seven nurses, team leaders of the inpatient clinics (Medical Clinic, Gynecology and Obstetrics Clinic, Surgical Clinic, Surgical Center, Neonatal ICU, Adult ICU and Pediatrics); and five employees from the administrative area (head of the Personnel Management Division, head and collaborators of the Personnel Administration Unit).

For the methodological purposes of the study, Tim *Brown's (2008) Design Thinking approach was adopted, the result of his experience as* a designer *and innovation consultant at IDEO, a* global design company , and presented in different works by the author (BROWN, 2008; 2010; 2018), however, considering convergent aspects that corroborate the model. According to Brown, the *Design Thinking* process consists of three stages with different purposes and contributions, which he calls "**innovation spaces**". These stages are not carried out sequentially, but rather in a diffuse, dynamic and interactive way, which allows us to return to the previous phases more than once, as ideas are polished and new directions are explored. The stages presented by Tim Brown (2018) in the *Design Thinking process model* are characterized as follows:- **Inspiration**: deals with the identification of a potential problem and/or opportunity, capable of driving the generation of new solutions. Initially, there is a *briefing* among the team, in order to weave the objectives to be achieved and think of reference standards to measure progress as the design activity is carried out with those involved in the process. From this, the team conducts research and immersions to better understand people, observe their life context, listen to their expectations and desires, and have greater clarity about the challenge at hand. - **Ideation**: this stage consists of the procedures of generating, developing, and experimenting with ideas. Syntheses are carried out to condense the findings and identify possible solutions. At this stage, many and diversified ideas are generated to solve the identified challenge, seeking to make prototypes tangible, test and refine through constant feedback, until the solution is ready to be implemented. - **Implementation:** At this stage, the best ideas are progressively transformed into artifacts that meet the objectives set at the beginning of the process. As prototypes are tested, interacted with, and refined, the team plans strategies that enable communication, insertion, monitoring, and evaluation of final deliverables.

For the production and treatment of the data, the research was divided into moments, distributed in the phases of Design Thinking, as illustrated in figure 1, which brings the image of the "double diamond", a symbol created by the non-profit organization, *Design Council*, and which has been widely used in various ways by designers and non-designers worldwide (BALL, 2020). In this case, an adaptation by Kloeckner (2018) was made.

Figure 1

Research moments distributed in the Design Thinking stages



Source: Adapted from KLOECKNER (2018).

The research contemplated the bioethical prerogatives, according to the Guidelines and Regulatory Standards for Research with Human Beings, of Resolution 466/12 of the National Health Council. It is part of the matrix project entitled: "Artifacts for the implementation of clinical management in a university hospital", approved under protocol CAAE: 09495919.9.0000.5541.

3 FINDINGS

3.1 CONVERTING PROBLEMS INTO OPPORTUNITIES: INSPIRATION THROUGH EMPATHY

In this stage, it was sought to understand the problem that was intended to be solved, and for that, it was necessary to dive into the research context, in order to obtain as much data, references and inspirations as possible, to understand the root of the problem and its impact on people's lives, in order to proceed with the development of the project. However, it should be noted that with the *Design Thinking* approach, the problem is delimited and solved as the project develops, through interaction between those involved in the investigation.

Fundamental to this immersion process was the continuous relationship with the actors involved in the problem and other *stakeholders*, in order to (re)know their real needs, as well

as the main ways of using probable artifacts that would be proposed, through the collaboration of different actors. In this sense, to carry out the primary searches, 19 participant observations were carried out, with the use of a field diary, in an approach to those involved in the process, appropriating information and *insights* about their needs in the solution ecosystem, as well as about the experiences of distribution and consumption of the artifacts.

In this process of interaction, in insertion into their work routines, especially of nurses, nursing heads, nursing technicians, and physiotherapists, diverse learning and feedback were obtained , in a planned and emergent way, as well as the identification of problems, the consequences of which are faced in the daily work. To this end, it was essential to develop empathy for them, observing, listening, feeling and understanding their needs, desires and behaviors; since the expertise of these professionals, in terms of human capital, constituted one of the main resources for the development of this research. In addition, secondary research was carried out in order to raise references that could support the investigation about the context of the problem, identifying solutions similar to alternatives that could help to solve the problem. In any case, at this stage, empathy proved to be a fundamental element, and based on informal dialogues, experiments, and validation of needs in direct, continuous and interactive contact with the *stakeholders* of the process, it was possible to deepen the understanding of the problems identified in the investigated context, systematizing them in a tree of problems that summarizes the main needs of the different actors (Table 1).

Table 1

Problems identified and their consequences observed and in the work routine of the Hospitalization Management Unit

Thematic categorical analysis

Units of meaning => Thematic categories => Themes

PROBLEM IDENTIFIED	**CONSEQUENCES (informal interviews + observations + documents)**
Failures in the communication process between managers and civil servants	● Lack of uniformity in the communication processes between managers and civil servants.
Deficiency in the dimensioning of personnel / Need to hire personnel	● Insufficient professionals to cover the shifts; ● Allocation of nurses in the support areas, compromising coverage in the care area; ● Insufficient number of physiotherapist professionals to attend to all patients in the clinics; ● Low coverage of the physiotherapy service;

	● High number of retirements, with no replacement of vacancies.
Deficiency in the roster management process	● High investment of time in the process of managing the schedules by the manager, to the detriment of other managerial activities; ● Vacation changes not always updated on the Intranet; ● Different attendance systems for CLT and statutory employees, and managers only have access to the system of the same professional linkage; ● Lack of support for the additional hospital on-call process offered to statutory employees; ● Difficulty in updating shift changes in the rosters.
Deficiency in the process of distributing inputs	● Presence of a minimum stock of supplies in the Medical Clinic, and there is a central warehouse.
Inadequate ward infrastructure	● Limited physical space in the wards for the execution of specific physiotherapy procedures, with the use of equipment; ● Impaired air circulation in the wards due to the curtains of the boxes.
Slowness in the admission process and discharge at hospitalization	● Lengthy admission process; ● Delay in administrative discharge, after medical discharge; patient keeps occupying the bed unnecessarily.
Limitations in the system and process of requesting care	● Physiotherapy care is often requested for patients who do not need it; ● There is no physiotherapy module in the current version of the hospital's management system, which does not include the multiprofessional team and requires manual activities.
Damage to workers' health	● Leaves due to health problems, including common mental disorders.

Source: Research data. Cuiabá, 2020.

From the survey of problems and related consequences, systematized based on the different manifestations of stakeholders, it was possible to notice that, among the main aspects that characterize the work context at UGI, a large part of the manager's time is taken up by the process of managing schedules. Although it is carried out monthly, with preparation, checking and publication of the same, changes are made daily in schedules already published, due to changes in employees' vacations or absences resulting from their legal leaves. Consequently, on several occasions, management needs to carry out relocations to fill gaps in uncovered shifts. As the occurrence of these changes is frequent, it is still difficult to update the scales published on the Intranet and on the clinics' bulletin boards.

In addition, problems related to the dimensioning of nursing professionals were observed due to lack of personnel, either due to retirements without the possibility of replacing

a vacancy, or due to legal leaves, mainly related to workers' health, which has made the preparation of schedules even more difficult.

These issues were discussed with the heads, individually, reaching the understanding that there are deficiencies in the process of managing the schedules, and that this problem compromises the implementation of clinical management principles by nursing, considering that it demands a great involvement of time in the management of the unit, to the detriment of the performance of other important activities for the conduction of the work teams with a view to undertaking actions of quality. Furthermore, the fact that the schedule process is extremely relevant was considered, especially because it determines the coverage of nursing professionals in all shifts, directly affecting the quality of care and patient safety.

Therefore, although several other important problems have been raised at this stage of the research, this was considered the problem that most compromises the development of propositional actions in the scope of nursing care management, and, therefore, the focus of investigation of this study in the construction of artifacts.

3.2 OPPORTUNITIES THAT GENERATE SOLUTIONS: CREATIVE STIMULI IN THE IDEATION PROCESS

At this stage, analyses, interpretations and syntheses of the data and information collected throughout the process were carried out, in order to find patterns and opportunities for the generation of solutions. It was also at this stage that the first ideas of artifacts spontaneously emerged, based on the *feeling* and expertise of the actors involved in the design process, so that they could be refined through research, experimentation and empirical validation. Thus, with this purpose, a Workshop Operationalization Plan was elaborated for this study, for the immersion of the participants in the problem, in search of possible solutions that favor the ideation of the artifacts.

The workshop began with the survey of the participants' expectations for the proposed work, and, collectively, they responded to the dynamics, demonstrating excellent expectations in relation to the activity, summarized in the following terms: integration; sharing ideas; learning; construction of improvement proposals; fluidity in the process; simplify processes; better results; facilitate; spirit of cooperation; integration between ideas; equity; communication; improvement; optimization.

Then, they participated in a lecture on "Entrepreneurial performance in nursing", an activity that aimed to stimulate the participants' creative skills, presenting them with

possibilities to visualize new ways of perceiving and interpreting reality, as well as to act on it creatively. As a result, there was a sensitization of the participants, with stimuli to the entrepreneurial mentality, making them aware of the need for proactive and entrepreneurial actions, as well as leadership in the search for innovative solutions, which favor significant improvements in the management of nursing care in the hospital.

After the lecture, the participants began the workshop activities, in two working groups, and had the help of management tools made available. In the composition of the groups, the heterogeneity of the professionals was sought, in order to apprehend different perspectives and collaboration of different actors in relation to the same process.

The first step was to understand the process of managing the scales and its impact on the achievement of institutional objectives, according to the implementation of clinical management principles, with the help of an orientation questionnaire, with the following questions: 1)Why does the process of scales exist?; 2) Where does it fit into the hospital's value chain?; 3) What is the criticality of this process?; 4) What are the risks if it is not reviewed and redesigned?; 5) What systems support this process?

It sought to analyze, interpret and synthesize the data and information produced so far, and collectively, to consider opportunities to generate new solutions. In summary, Group1 (G1) considered the process of managing the schedules a tool with potential for organizing services and that helps in the continuity of nursing care, but highlighted the critical nature of its execution, due to the high occurrence of absenteeism in the teams. Group 2 (G2), on the other hand, highlighted that the process favors the organizational planning of the units, functioning as an important management tool. It was considered complex, due to the lack of nursing professionals, due to the deficiency in the dimensioning of personnel, something that, according to the group, directly interferes with the quality of care.

Table 2

SWOT matrix prepared by Groups 1 and 2 in the workshop to review the process of nursing schedules in the hospital

	POSITIVE FACTORS		**NEGATIVE FACTORS**	
	FORCES		**WEAKNESSES**	
		Existence of a standardized spreadsheet for the preparation		

INTERNAL FACTORS	**G 1**	of scales and an automatic system for recording attendance	**G 1**	Low flexibility in the instruments identified as strengths
	G 2	Employee commitment and supportive management	**G 2**	Lack of a supervision process to manage the coverage of shifts in case of absence of a nursing professional, among other actions.
EXTERNAL FACTORS		**OPPORTUNITIES**		**THREATS**
	G 1	An automated system is being developed to be implemented for the preparation of schedules	**G 1**	High rate of absenteeism, as well as the work overload of nursing professionals.
	G 2	Training programs	**G 2**	The illness of professionals due to work overload, and the high rate of absenteeism.

Source: Research data. Cuiabá, 2020.

In the case of G2, its members considered the commitment of employees and the support of management as strengths within the shift management process, however, they highlighted the lack of supervision processes that enable the effective management of shifts, in cases of absence of professionals, as a weak point. As for the opportunities, G2 highlighted the training programs in the preparation of the schedules, which will possibly allow other professionals to perform this work, not only professionals in management positions. As a threat, G2 considered the illness of professionals, highlighting that this type of occurrence has been frequent and, consequently, the absenteeism rate has increased, something that further compromises the effectiveness of the shift management process.

The possibility of knowing and deepening the understanding of the people who will benefit from the solution, their daily problems and expectations of resolution was fundamental to this stage of the *Design Thinking process,* since the generation of ideas is essential to this approach, both before ideation, in the identification of patterns and opportunities, as later, by prioritizing the alternatives to be prototyped.

3.3 FROM PROTOTYPING TO ARTIFACT DESIGN: IMPLEMENTING ENTREPRENEURIAL SOLUTIONS

In this internship, the co-creation of prototypes that could be tested, iterated and refined, considering the needs of the users, and that were of interest to the hospital study was sought. Thus, the prototyping phase in the design process has among its characteristics, the possibility of knowing and deepening the understanding of the people who will benefit from the artifact, the problems of the work and solution proposals.

Thus, with the help of the modeling notations of the flows of the process under study, in continuity with the activities of the workshop, each group dedicated itself to analyzing the activities of this process, verifying the relevance of each one of them and what could be improved. Using the tool Matrix Opportunities *versus* Consequences – Risk *versus* Possible Solution, they discussed and listed opportunities for improvement in the process, paying attention to the impacts of each of them, as presented in Table 4. And with that, the fifth moment of the research began.

In G1, the participants identified the opportunity to prepare the scales in advance, with the necessary information for their elaboration, being made available in advance. In this case, they realized that the consequence would be positive, that is, the time for preparing the schedules would be optimized, and the closing deadline would not be compromised. However, the tool leads to thinking about undesirable occurrences, such as in the case of professionals feeling dissatisfied with the increase in this activity. To prevent such dissatisfaction, the group thought of promoting co-responsibility among professionals, with motivational actions, practicing active listening, in order to reach a consensus that optimizing the time for the elaboration of the definitive schedules will reflect positively on all nursing professionals.

Table 3

Synthesis matrix of possible solutions to improve the nursing rosters process, based on opportunities, consequences and risks

OPPORTUNITY	**CONSEQUENCE**	**RISK**	**SOLUTION**
What if...	**Possible consequence...**	**If it occurs...**	**Possible solution**

1	Should the scale be prepared in advance with all the available information?	It would optimize the time for the preparation of monthly schedules	Dissatisfaction of professionals in carrying out this activity.	Promote the co-responsibility of professionals regarding the roster process; practice active listening and promote motivational actions.
2	Would you elaborate the schedules in advance? Carry out an internal selection process to relocate professionals in the units?	It would need information on vacations, leaves and time off for professionals in advance, which would require a task force. It could cause a lack of professionals in some units	Cause gaps in other units	Entry of new civil servants through public tender in progress

Source: Research data. Cuiabá, 2020.

Interestingly, the G2 also envisioned the prior elaboration of the scales as an opportunity for improvement, and that, in their view, it would be within the governability of the actors involved in the process. However, they warned that the consequence would be in relation to the information necessary for the preparation (vacations, leaves, time off for professionals) that need to be available in a timely manner. They also identified the opportunity to carry out an internal selection process for relocation of employees for long-term permanence in other units, as needed. However, they thought about the occurrence of unroofing of units, if these long-term relocations happen. To solve this issue, they saw as a solution the opening of a public tender for the admission of new civil servants, in replacement of existing vacancies.

The dynamics implemented with the preparation of this matrix proved to be pertinent to the prototyping stage, because from this, we had the opportunity to validate possibilities, obtain learning about the problem and the possible solution, and, especially, to verify the existence of demands that support the proposals for artifacts. As each group had several

stakeholders, different ideas, concepts and proposals were produced to solve the proposed challenges, however, reaching a consensus as a group.

According to the guidelines of the literature, which deal with the *Design Thinking* approach, from the central problem, several techniques and tools could be used in this study to stimulate the creative potential of the participants, which favored the co-creation movement, and guided the participants involved in the evaluation and guidance of choices that could be prototyped and tested. Therefore, at this point in the workshop, the participants were already more aware of the problems and their consequences, enough to see alternatives that could constitute proposals for improvements, as solutions to such problems. From this point on, the groups matured their ideas in discussion about the opportunities for improvement envisioned, starting to make more purposeful definitions.

G1 emphasized the possibility of including specific attributions in nursing work, characterized as nursing supervision, a function directly related to the management of nursing care, in line with the recommendations of the Federal Nursing Council. In this case, G1 presented, among other arguments, the possibility of granting greater autonomy for daily monitoring of the units, and with responsibility in decision-making to solve any needs for temporary relocations and filling gaps in the rosters. G2, on the other hand, emphasized as the main solution proposal, the elaboration of a previous schedule that allows subsidizing the elaboration of definitive schedules. In addition, he proposed as an alternative to the improvement of long-term relocation mechanisms, the preparation of an internal relocation notice.

Discussing these proposals in plenary, and refining them, the participants reached a consensus that three artifacts would be necessary to solve the focal problem, namely: 1) Elaboration of a Preliminary Scale, to be applied in the Neonatal ICU, as a pilot and later in the other units; 2) Preparation and publication of the Internal Relocation Notice; 3) Creation of the Nursing Supervision process in the Inpatient Management and Outpatient Management Units.

In this internship, it was essential to prototyping, obtaining *feedback* from the participants on the solutions thought of, as well as defining minimum requirements to allow structuring a *make-up* for discussion, experimentation and refinement. A more empathetic relationship with users was noticed, since frequent feedback was received, which allowed them to learn from the obstacles of the process, verify what works and what needed to be discarded, in addition to enabling the continuous improvement of the solution proposal, until

it became an artifact. Based on these premises, we sought to co-create prototypes that could be tested, interacted with and refined, considering their needs, and that were of interest to the hospital where the study was conducted, in this case, contributed in some way to the implementation of clinical management principles.

Thus, the sixth moment of the research began, with the opening of a process in the institution's Electronic Information System (SEI) by the Head of the Nursing Division, who coordinated the activities, together with the researcher. The procedures for creating prototypes are described below:

3.3.1 Prior Schedule

For the preparation of the Preliminary Schedule of the Neonatal ICU, the Personnel Management Division made available the standard spreadsheets of scales for this unit, for the months of April to August 2020, containing the information on vacation scheduling and legal leaves of the respective professionals. Information on the time off preferences of these professionals was collected through an *online form*. This information was necessary for the elaboration of the monthly scales, however, for the projected artifact, it was defined that they would be made available in advance, in order to allow the elaboration of what can be called the "matrix of the scales".

Throughout the work, it was noticed that the information sent by the Personnel Management Division became outdated, as there were changes in the vacation schedules of some employees. Therefore, there was consensus that the work should be carried out in conjunction with the Personnel Management Division, so that the information could be promptly updated. In this sense, it is worth mentioning that the *Design Thinking* approach does not allow interruptions in the work when something is perceived that was not foreseen, due to the fact that it is prototyping and testing, which presupposes changes and refinements, until the final product is constituted, approved by all participants.

Through monthly evaluations of the team leaders with the head of the Nursing Division and the Personnel Management Division, adjustments are made, as necessary.

3.3.2 Notice of Internal Relocation

For the preparation of the Public Notice, first, a survey was carried out on the current sizing of the care units, and the minimum necessary as recommended by the regulations of the National Nursing Council. To this end, an online form was also used , which was available

for completion during a period of one week. With the information collected, the draft of the Public Notice was prepared, inspired by the model of another university hospital in the EBSERH network, with the necessary adjustments to the local reality. Through meetings with those involved, the Notice was validated for approval and publication.

It is noteworthy that the preparation of the Internal Relocation Notice in the investigated scenario proved to be a strategically important instrument, not only in the process of allocating personnel to fill vacancies due to prolonged absences of their occupants, but also in situations of retirements without the possibility of immediate replacement. It is also noteworthy the argument of the head of the Personnel Management Division, who identified in this artifact an appropriate instrument to be incorporated into the Personnel Management Program, which was in the preparation phase at the hospital where the study was located. According to her, the Internal Relocation Notice falls into several categories of the program, in particular, the one that refers to the "appreciation of people in the institution". In this sense, the proposition of this artifact is in line with the granting of important rights of employees, which is a way for them to manifest their expectations of working within the hospital, signaling the units in which they wish to work, and, following the necessary criteria, enabling them to relocate the sector, according to the vacancies available.

3.3.3 Nursing Supervision Process

The third idealized artifact consists of the process of supervision of nursing work, to be included in the attributions of the UGI and UGA. The proposal is that, in both units, activities related to the supervision process be implemented, but with rotation among the supervising nurses, that is: one in the first shift, from 7:00 a.m. to 2:00 p.m., and the other in the second shift, from 1:00 p.m. to 8:00 p.m., with the assignment being exercised from Monday to Friday, with alternating shifts on weekends and holidays, at the same times.

To define the activities to be carried out, the management team held several meetings among themselves, discussing what was pertinent and possible to be done by the two units, analyzing and refining the proposed activities. Therefore, the following duties to the supervisor were defined, in general terms:

I. Supervise nursing work in care management: manage priorities; distribute activities; provide technical guidance to professionals; monitor the development of professionals with a view to meeting the established goals; guide the team on risk prevention

mechanisms, aiming at patient safety in all phases of the care process; carry out visits, in each shift, in the units of critical patients.

II. Supervise the changes of shifts in each shift: manage the execution of the shifts; provide for the reassignment of professionals between the units, as needed, and in accordance with the recommendations of the Nursing Councils; manage any conflicts in the care units.

III. Supervise the management of schedules: guide team leaders on adjustments that may be necessary, and interact with the People Management Division; manage the preparation of schedules aimed at covering all shifts, according to the recommendations of the Nursing Councils, and compliance with the relevant standards; manage, together with the Personnel Management Division, the closing of the shifts within the agreed deadlines.

It should be noted that at this stage of the *Design Thinking* process, the strategies for implementation do not necessarily need to be well defined, and the deliberation about them emerges from field tests, without the need for a rigorously planned stage. In any case, it is noteworthy that several strategic meetings were held with the heads of the care units, to discuss the dissemination of the artifacts and guidance to professionals for their implementation.·

4 DISCUSSION

Especially if we consider the management of nursing work, the object delimited in this study, it was perceived the incorporation of principles of clinical management in the design of its artifacts, when considering the articulations made to conceive deliveries that could really satisfy the needs of service professionals in this field of study. In this regard, for example, Siewert et al. (2017) adduce that the processes in nursing work are directly aligned with the management of comprehensive health care, which, in turn, is aligned with the orientation towards health needs and integrality of patient care, one of the principles of clinical management.

The fact that the design of the artifacts outlined here initially took place in an intuitive and exploratory way, based on the experimentation of alternatives, is consistent with the proposal of the *Design Thinking* approach, and corroborates the perspective that there is no single way or model of/to develop a process (BROWN, 2018); and that the design activity matures, according to the development and validation of solution possibilities (BEST, 2012),

providing unique learning and discoveries about the problems and the proposed solutions. But, in general, it consists of an approach that is naturally integrated into the design process, taking place through phases and supported by methods that allow starting from a problem towards possible solutions (BROWN; WYATT, 2010).

This reference model allowed the investigation of initiatives of the clinical management model undertaken in the investigated hospital, as well as the identification of principles that particularize its processes, when entering the design practice of the *Design Thinking* approach. As pointed out in the literature, it was clear that there is no way to dissociate the principles of this management model, since all of them, in some way, are related to knowledge and practices articulated in the triad of management, care and education, and thus demand co-responsibility among the actors involved in the care processes, in orientation to the needs and results that add value to the health and life of collectives (PADILHA et al., 2018). That said, it is observed that several principles of clinical management can be present in nursing management processes through the projection of artifacts, even if their implementation is incipient and silent, since the model is not only linked to functional and communicational aspects, but also to procedures articulated with projection, production and supply of its deliveries.

From this perspective, the empathy developed in the approach to the research participants was essential to start the Design Thinking inspiration stage, as it allowed exploring the context of the daily life of nursing work processes, with a view to the identification of concrete problems, which are often mixed with each other, making it difficult to understand what is actually a problem and what is a consequence. The challenge to be solved was delimited as the project unfolded, which is in line with Mello's (2014) orientation, that problem and solution emerge together, throughout the project, being clarified simultaneously with other activities of the design process.

In any case, the prioritization of the target problem of the creation of artifacts was made in the light of principles of clinical management, which, similar to the *Design Thinking* approach, is anchored in the transformation of realities, situating education as a device for the transformation of care practices, management and education itself. According to Padilha et al. (2018), in order to transform, in order to produce comprehensive health care, with quality and safety, and oriented to the health needs of people and populations, all those involved in the process need to contribute to the expansion of the reading of reality, through criticality and the ability to dialogue with different perspectives. This perspective reinforced the value

of experimentation and validation in the field as opportunities to learn about the different aspects associated with the problem ecosystem, and in this sense, the process became more specific and less comprehensive, as interactions and validation of possibilities took place (ALT, 2011).

Thus, it was perceived that the deficiency in the management processes of nursing schedules has impaired, in addition to the nursing teams, the performance of managers in other processes and activities assigned to them, due to the excessive time allocated to this execution, which culminates in the lack of cooperation and co-responsibility of the actors involved, generating overloads. From this perspective, it is noted that one of the principles of clinical management is compromised, if we consider the need for articulated processes of cooperation between the actors involved, valuing participation and stimulating the autonomy and creativity of professionals in the context of health care (PADILHA, 2018).

In addition, this unwanted situation, even if indirectly, compromises the comprehensive care and quality of the services provided, since it is a process that quantifies and qualifies the performance of hospital nursing. This condition is asserted in other studies, such as the research by Costa et al. (2018), which associate the quality of care with overload factors, arguing that the fact that nurses are unable to perform their work as they should, interferes with the quality of care provided, and it is important to reflect on strategies that provide opportunities for the development of improvements in nursing work.

The guarantee of an adequate number of nursing professionals in care units is essential for the quality of patient care in hospitals, both public and private. In this sense, people management is a relevant factor for the adequate coverage of nursing professionals in hospital clinics, and when there are difficulties, especially with regard to staff reduction or absenteeism, negative implications arise both for patient care and for the team's working conditions, care and management (SILVA et al., 2019).

Likewise, the uninterrupted coverage of professionals in this area is a key factor in ensuring comprehensive care for patients hospitalized in the hospital. The process of shifts implies the organization of the various working hours, which are essential for the coverage of shifts, 24 hours a day and 7 days a week (SOUZA et al., 2011). Corroborating the literature presented, one of the negative aspects in relation to the process of the scales, identified by the research participants in the workshop, still in the Inspiration stage, as a threat to the process, was the high rate of absenteeism of professionals, especially due to illness.

The issue of absenteeism, in fact, deserves specific treatment to identify the causes and forms of intervention. The absence of scheduled professionals, who later present medical certificates, is frequent, according to the participants discussed in the workshop, and compromises the execution of the schedules. Studies have brought the debate on the subject, both in terms of its consequences, as they compromise institutional performance and loss of quality, directly reflecting on the care provided, and its causes, which have focused more on the factors that predispose professionals to illness. (KURCGANT et al., 2015). According to SILVA and MERINO (2017), absenteeism is triggered, among other causes, by the organization of work and illness, including mental disorders.

In addition to the issues mentioned above, the participants discussed the problem that the hospital suffers from retirements, with no possibility of replacing vacancies, and realized that this reality also affects the process of schedules, but is outside the governability of the research actors. They glimpsed, however, the opportunity to hold a public tender, which brings hope that at least there will be a minimization of the problem of personnel sizing, caused by the unfilled vacancies.

Although the issue is not in the governability of the participants, the subject had to be discussed, since the *Design Thinking* approach instigates immersion in the problem, and thus it is possible to identify the various aspects that affect it, but the refinement of ideas directs to what can be manageable (KLOECKNER 2018). This is very important to understand the problem, and to see which paths are possible to follow, also recording those that are not possible, but relevant to act in another context and opportunity.

Regarding the nursing staff dimensioning process, SILVA, et al. (2019) clarifies that it should be carried out according to the practice of centered user care and in a problem-solving way. According to COFEN Resolution No. 543 of 2017, in article 2, the dimensioning of the nursing staff must be based on characteristics related to the health service, the nursing service and the patient (COFEN, 2017).

The clinic's management proposal also presupposes a process of co-responsibility and contractualism, still not widespread in the current organizational culture, in which health professionals and managers compete for space more than they admit to living with the same problem (ACIOLE, 2012). However, the production of data with *Design Thinking* presupposes collaborative activity, in which it is necessary to leave the limited vision of focusing only on individual perspectives, and start to consider collaborative activity, weighing the needs of the

other actors under a single problem, so that they enter the ideation process in favor of common solutions (ALT; PINHEIRO, 2011; BROWN, 2018).

The execution of the ideation stage produced a large volume of data, information and ideas, so it was necessary to use various visual resources and tools to facilitate inspiration, communication, consensus and decision-making in the moments that make up this stage. As in Souza's (2017) research, collaboration at this stage had to be more restricted than at other times in the design activity, relying on the collaboration of professionals in a more strategic position in the hospital, such as nurses in management positions, to discuss, classify, select, adapt, combine, create and prioritize alternatives, according to the nature of the project and the findings obtained in the process.

The Preliminary Scale, an artifact built for the Neonatal ICU, now exists as a matrix instrument for the elaboration of the definitive scales of the corresponding months, containing the necessary and possible information to be advanced for the period. Therefore, it is assumed that the work demand for the preparation of the monthly schedules will only be the filling of any changes. It is also considered that the creation of the artifact had as one of the requirements, the planning of those involved in the work at the hospital during the subsequent six months, already thinking about vacations, legal leaves for pregnant women, going out to courses, among other eventualities that could be foreseen. Currently, this process takes place monthly, in this way, it can promote optimization of the time of everyone involved in the process. The opportunity for each professional in the unit to carry out personal planning for the semester is considered extremely valid, since the working day in the health institution occupies a large part of their time. Many of the problems faced in daily life stem from the lack of personal planning, so that the long-term vision in organizations is fundamental to design their paths (NETO; MALIK, 2011), this same premise can be applied to the lives of nursing professionals at this hospital.

The Internal Relocation Notice is a device of legal force, objective and transparent content within the institution. It is worth emphasizing that this artifact opens a channel for the manifestation of the desire of nursing professionals to work within the institution, valuing them. It is, therefore, a positive factor for the improvement of the organizational climate, motivating professionals to commit to the objectives of the hospital organization, similar to what was pointed out in a study by Santana and Estender (2018).

The third artifact consisted of the implementation of the nursing supervision process in the Outpatient and Inpatient Management Units, which can contribute to managers in

making more assertive decisions, based on technical foundations and in accordance with current standards, sensitive to the appreciation of people (patients and professionals), recognizing the public interest above the private interest, as recommended in the legislation on public services. According to Chaves et al. (2017), the supervision activity is essential for the adequate organization and conduct of patient care work, since it requires nursing managers to permanently analyze the organizational context in articulation with health policies, mediating negotiations of interests, desires, powers, and values between workers and the hospital's senior management; as well as the monitoring of interventions and results achieved, favoring the development of teaching and learning processes with the work teams. Therefore, the proposition of this artifact, supported by the other prototyped artifacts, proves to be a strong ally in the implementation of clinical management principles. The capacity for innovation in proposing these emerged from unexpected paths, in simpler solutions, and more elaborate deliveries, which can be consumed at different times, similar to health work, in which the realization and consumption occur simultaneously, in action.

5 CONCLUSION

The characteristics of *Design Thinking* were identified in the projection of the researched artifacts, which also particularize some of the clinic's management principles, a management model adopted in the investigated hospital. The main one is that both are human-centered: like the principles of clinic management, which considers the valorization of individuals, both health service users and health professionals, *Design Thinking* has as its premise valuing the capacity of individuals, and, therefore, it is not only human-centered, but human by nature, as alluded to in the literature that supports this research.

Thus, it is concluded that each model follows its own process in its design stages, being influenced by the context of the scenario involved and by the knowledge and experience of the proponents. In addition, they have similarities in their principles, which, among others, presuppose human centricity, collaboration among *stakeholders*, experimentation of solutions, ideation of better alternatives, and interactive configuration in their approaches. It was noticed that the more professionals recognize the existence of problems in their practices, the greater the propensity to think of them as challenges to be solved, and, consequently, they feel stimulated to seek new and different opportunities for projecting artifacts.

The emergence of desirable, feasible, applicable and sustainable solutions to deal with the problems of the university hospital scenario opens up a series of opportunities for new research. From this perspective, this work, which had as its object of study the management of the clinic in a university hospital, a strategic field for facing rising challenges in Brazil; and *Design Thinking*, an approach that has not yet been explored in the health universe, but is commonly used to solve problems in organizational practice; identified some possibilities for further studies, such as the creation of indicators for monitoring and evaluating these artifacts, together with care indicators, in order to observe their relationship with the improvement of care in the hospital; the deepening of the study of the other problems identified in research it is also recommended, in the sense of seeking solutions for them.

Considering the experience of this research, it is suggested the continuity and deepening of scientific research in use of the *Design Thinking approach*, which may mature this practice, making it one of the allies of hospital management in the search for quick and effective solutions that meet the complex nature of the hospital institution.

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