NEONPASS ROOM: A DIGITAL INTERACTION TOOL BETWEEN PATIENT, CARE AND HOSPITAL GOVERNANCE AREAS

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ABSTRACT

Objective: to report the process of implementing a digital solution for interaction between patients, care and hospital governance areas.

Method: this is an experience report on the implementation which took place between the months of August and November in a large private hospital located in the city of São Paulo, Brazil, conducted in two stages: 1) implementation in August 2022; and 2) follow-up lasting 13 weeks, until November 2022.

Results: the solution consists of an application developed by a Brazilian startup company which was installed on tablets allowing hospitalized patients to view and make requests for the most diverse areas of care. A total of 496 patients used the Neonpass Room, with their requests addressed directly to the areas of nursing, nutrition, hospitality, cleaning and maintenance. There was a predominance of requests for the nursing team (1029/33.3%), followed by nutrition (973/31.5%), hospitality (763/24.7%), cleaning (167/5.4%) and maintenance (157/5.1%).

Conclusion: the Neonpass Room solution has been shown to improve the efficient distribution of requests to the appropriate areas. Unlike traditional call button systems, the digital tool directed demands to nursing and governance areas, with clear specifications.

DESCRIPTORS: Digital technology. Nursing. Multimedia. Quality improvement. Diffusion of innovations.

NEONPASS ROOM: UMA FERRAMENTA DE INTERAÇÃO DIGITAL ENTRE PACIENTE, ÁREAS ASSISTENCIAIS E DE GOVERNANÇA HOSPITALAR

RESUMO

Objetivo: relatar o processo de implantação de uma solução digital para interação entre paciente, áreas assistenciais e de governança hospitalar.

Método: trata-se de um relato de experiência sobre a implantação que ocorreu entre os meses de agosto e novembro em um hospital privado de grande porte, localizado na cidade de São Paulo, realizado em duas etapas: 1) implantação, em agosto de 2022 e 2) acompanhamento, durante 13 semanas, até novembro de 2022.

Resultados: A solução consiste em um aplicativo desenvolvido por uma *startup* brasileira, que foi instalado em tablets permitindo que pacientes internados pudessem visualizar e realizar solicitações para as mais diversas áreas assistenciais. 496 pacientes fizeram o uso do *Neonpass Room*, tendo suas solicitações dirigidas diretamente às áreas de enfermagem, nutrição, hotelaria, limpeza e manutenção. Observou-se predomínio de solicitações para a equipe de enfermagem (1029/33,3%), seguida da nutrição (973/31,5%), hotelaria (763/24,7%), limpeza (167/5,4%) e manutenção (157/5,1%).

Conclusão: a solução *Neonpass Room* demonstrou aprimorar a distribuição eficiente das solicitações para as áreas apropriadas. Ao contrário das campainhas tradicionais, a ferramenta digital direcionou as demandas para a enfermagem e áreas de governança, com especificações claras.

DESCRITORES: Tecnologia digital. Enfermagem. Multimídia. Melhoria de qualidade. Difusão de inovações.

NEONPASS ROOM: UNA HERRAMIENTA DE INTERACCIÓN DIGITAL ENTRE ÁREAS DE PACIENTE, ATENCIÓN Y GOBERNANZA HOSPITALARIA

RESUMEN

Objetivo: informar el proceso de implementación de una solución digital para la interacción entre pacientes, áreas de atención y gobernanza hospitalaria.

Método: se trata de un relato de experiencia sobre la implementación que tuvo lugar entre los meses de agosto y noviembre en un gran hospital privado, ubicado en la ciudad de São Paulo, realizada en dos etapas: 1) implementación, en agosto de 2022 y 2) seguimiento, con una duración de 13 semanas, hasta noviembre de 2022.

Resultados: La solución consiste en una aplicación desarrollada por una *startup* brasileña, que se instaló en tabletas y permitió a los pacientes hospitalizados visualizar y realizar solicitudes para las más diversas áreas de atención. 496 pacientes utilizaron la Neonpass *Room*, con sus solicitudes dirigidas directamente a las áreas de enfermería, nutrición, hotelería, limpieza y mantenimiento. Hubo predominio de solicitudes para el equipo de enfermería (1.029/33,3%), seguido de nutrición (973/31,5%), hospitalidad (763/24,7%), limpieza (167/5,4%) y mantenimiento (157/5,1%).

Conclusión: Se ha demostrado que la solución Neonpass *Room* mejora la distribución eficiente de las solicitudes a las áreas adecuadas. A diferencia de los timbres tradicionales, la herramienta digital dirigió las demandas a las áreas de enfermería y gobernanza, con especificaciones claras.

DESCRIPTORES: Tecnología digital. Enfermería. Multimedia. Mejora de calidad. Difusión de innovaciones.

INTRODUCTION

The provision of healthcare within the different care levels (primary, secondary or tertiary) involves nuances in operationalizing care that integrate multiple management, operational and care areas[1]. It is noteworthy that care management requires implementing practical models which involve various facets of management and healthcare, as well as trained and positioned leaders to perform their functions in a safe and optimized manner[2].

The delicate and complex set of processes that patients navigate characterizes the patient journey[1]. This trajectory is made possible through activities which are planned and executed by different areas composed of highly specialized teams, and which enable healthcare through a complex system of interaction between them[1].

The management, operational and care areas must collaborate in developing the integrated care plan; this involves identifying common goals, necessary resources and strategies to achieve efficient care provision[3,4]. In the context of a hospital, developing a care system that integrates multiple areas requires careful design. This may involve creating protocols and workflows which facilitate communication and collaboration between different departments and teams[5]. The interaction between areas that may or may not be perceived by the end users of the service must be considered[1,5–6].

The nursing team permeates the various interactions of the patient-family binomial with health professionals, being composed of auxiliary professionals, technicians and nurses who work on several care fronts and in administrative management, intermediating the reception of patients' and their companions' demands, whether clinical or administrative[1,7–9].

The involvement of the nursing team is characterized by the team's protagonism as an effective means by which patient-centered care can be achieved. These nursing professionals are the ones who receive, signal and monitor the multiple processes that will have an impact on the patient's experience[8,10].

It is observed that care and administrative demands in hospitals are centralized in the nursing team, mainly in the role of the nurse as manager of the unit. It is possible to verify the plurality of processes in which this team is involved, which is time consuming and often generates a high workload. In this sense, space is opened to ask what can be done using governance and technology strategies in order to achieve greater care effectiveness, improve the experience and consequently advance the quality of the patient's journey[5,11–13].

By focusing on strategies for optimizing processes, we find technological resources that can facilitate interaction between the patient and the requested areas, establishing direct contact with the responsible teams. The use of digital tools which effectively perform this communication can be a powerful ally to gain efficiency[14–15]. Furthermore, digital tools that eliminate intermediaries in the communication structure can ensure the integrity, convenience and effectiveness of the process, and can also develop knowledge, skills and confidence in digital health[16–19].

Focusing on optimizing the patient's journey and experience through the application of a technological product aimed at directing demands, this experience report aims to describe the process of implementing a digital solution for interaction between patients, care areas and hospital governance. The solution used was Neonpass Room®, developed by the healthtech company Hoobox®. Among other resources, it offers the possibility for the patient, their family members/companions to make requests directly to the areas responsible for the demand, such as hospitality, nutrition, cleaning and maintenance; for example, the request for water replacement is handled by the nutrition service. All demands in the hospital routine are directed to nursing through a call button at the bedside, which impacts the routine of these professionals who (in this example mentioned above) will mediate the request between nutrition and the patient. By incorporating this service routing algorithm, the Neonpass Room®

facilitates and speeds up communication between the patient and healthcare professionals, eliminating informal communications such as by telephone/extensions, or even bureaucratic processes, such as filling out service orders and internal communications.

This report is also justified by the need to study alternative ways of avoiding frequent interruptions in the nursing routine that could generate risks in care processes, and even work overload in search of resolving demands which are often not specific to nursing team professionals. Another benefit that is intended to be presented with the use of this tool is to improve the communication process within hospital units, which impacts the patient experience.

METHOD

This is an experience report on the implementation process of the Neonpass Room® digital solution, conducted in a large private hospital located in the city of São Paulo, Brazil. The hospital has 170 hospitalization beds, 78 critical beds and 10 surgery center rooms. The hospital performs more than 10,000 surgeries each year and attends around 100,000 patients in the Emergency Room. The experiment was conducted in two inpatient units with 27 beds, one for oncology with 17 beds and a sector specializing in bariatric and colorectal surgery with 10 beds. The reported process was carried out in two stages: 1) implementation on August 17, 2022; and 2) follow-up lasting 13 weeks, until November 16, 2022.

The study met all the guidelines established in Resolution 466/2012 of the National Health Council and was approved by the Human Research Ethics Committee of the hospital that was the subject of this study.

RESULTS

Digital solution

The tool is composed of a set of two distinct interfaces. The first consists of the patient interface, which is the Neonpass Room® application on a tablet installed next to the bed, properly configured and used by the patient to make requests, which also has a smartphone version. Figure 1 illustrates the solution's patient interface. The second interface is aimed at support teams responsible for receiving and processing requests, available in two versions: i) a web system, to be accessed by desktop computers; and ii) a mobile application for tablets and smartphones.

The hospital used both configurations during this study. The order routing flow is illustrated in Figure 2.

The interface panel located at the nursing station and in each of the sectors where the implementation took place enables the various professionals to be aware of the processes that are in progress, and can even plan their care based on the progress of such processes. A cross-sectional study with intensive care and emergency nurses from 26 public hospitals in Madrid aimed to identify the needs related to safety, organization, decision-making and communication perceived by these professionals during the acute phase of the COVID-19 epidemic crisis in 2020. Among the results, it is noteworthy that streamlining the communication process and meeting patient demands were highlighted as essential for improving the quality of clinical outcomes[20].

Figure 3 illustrates the requests received at a nursing station. Requests in blue are open and have not yet been fulfilled, requests in yellow are in progress, and requests in green have been completed. In the example in Figure 3, two requests were opened (for different beds, at 13:57 and 13:59). One of the requests is along the lines of "I'm not feeling well" and another, "I have a question – My discharge is tomorrow, I would like to let my son know." In this case, care can be prioritized in the case of a reduced team or even better schedule professionals according to their competence.
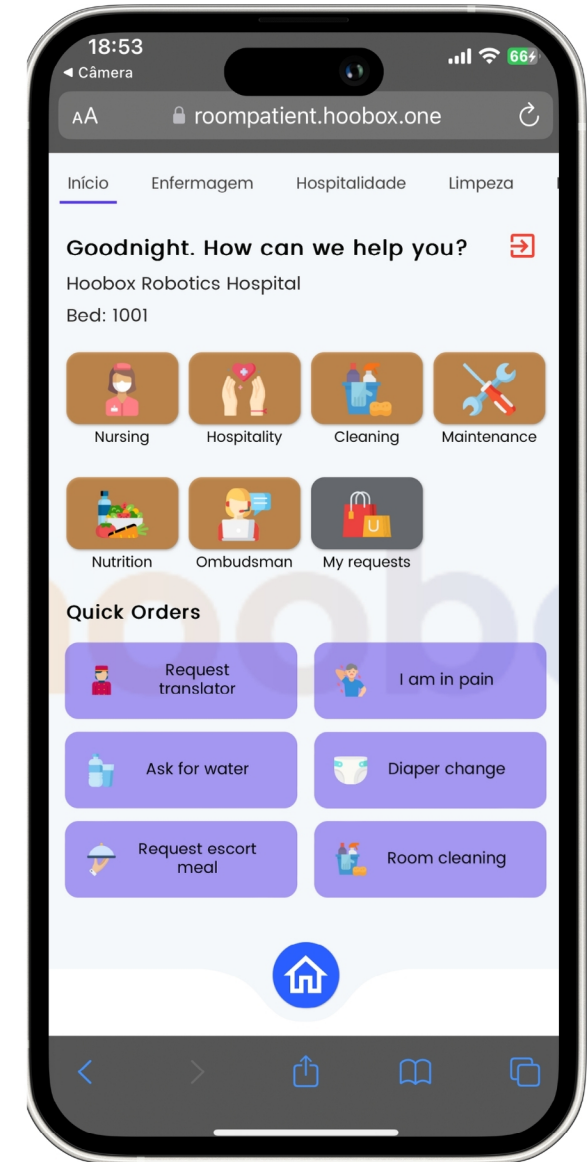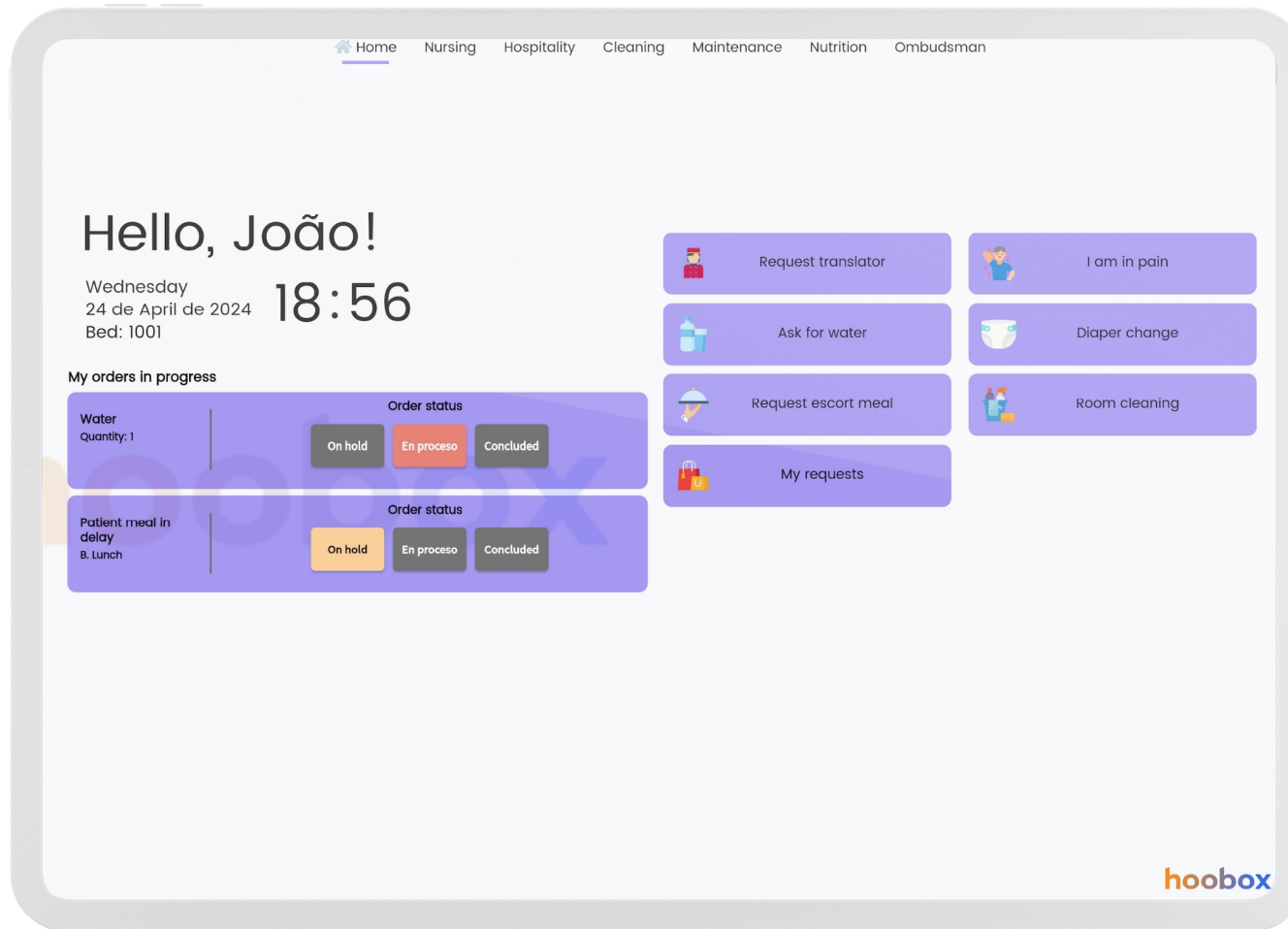
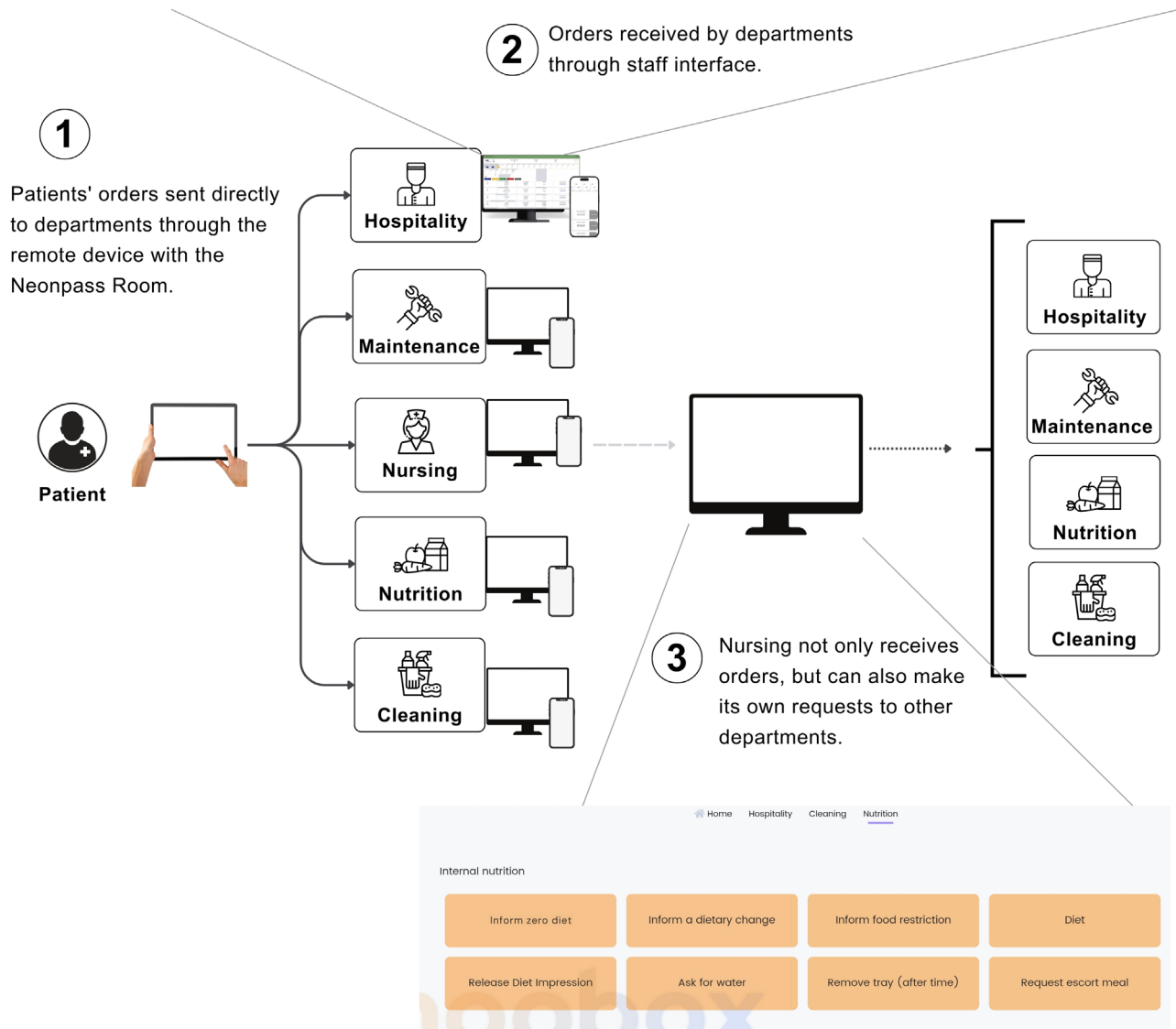**Figure 1 –** Patient interface on the Neonpass Room®.

Figure 2 – Neonpass Room® tool operating flow**.**

A study carried out with 15 nurse managers and 47 bedside nurses in hospital units found that the demand for nurses to work in the unit was unscientific. Nurses stated their frustration with the number of calls from patients and/or companions who did not need to be specifically attended to by nurses[21].

Another study which aimed to evaluate the demands of work at the patient's bedside in intensive, general and intermediate care wards of a large German hospital demonstrated that organizational commitment is necessary with a focus on improving nurses' work environments in order to manage work overload, and consequently the health of workers[22]. With the same perspective, a study with Chinese nurses highlights the need to employ work demands-resources models that facilitate and support the management of team activities, favoring a reduction of work overload and aspects involving patient safety[22].
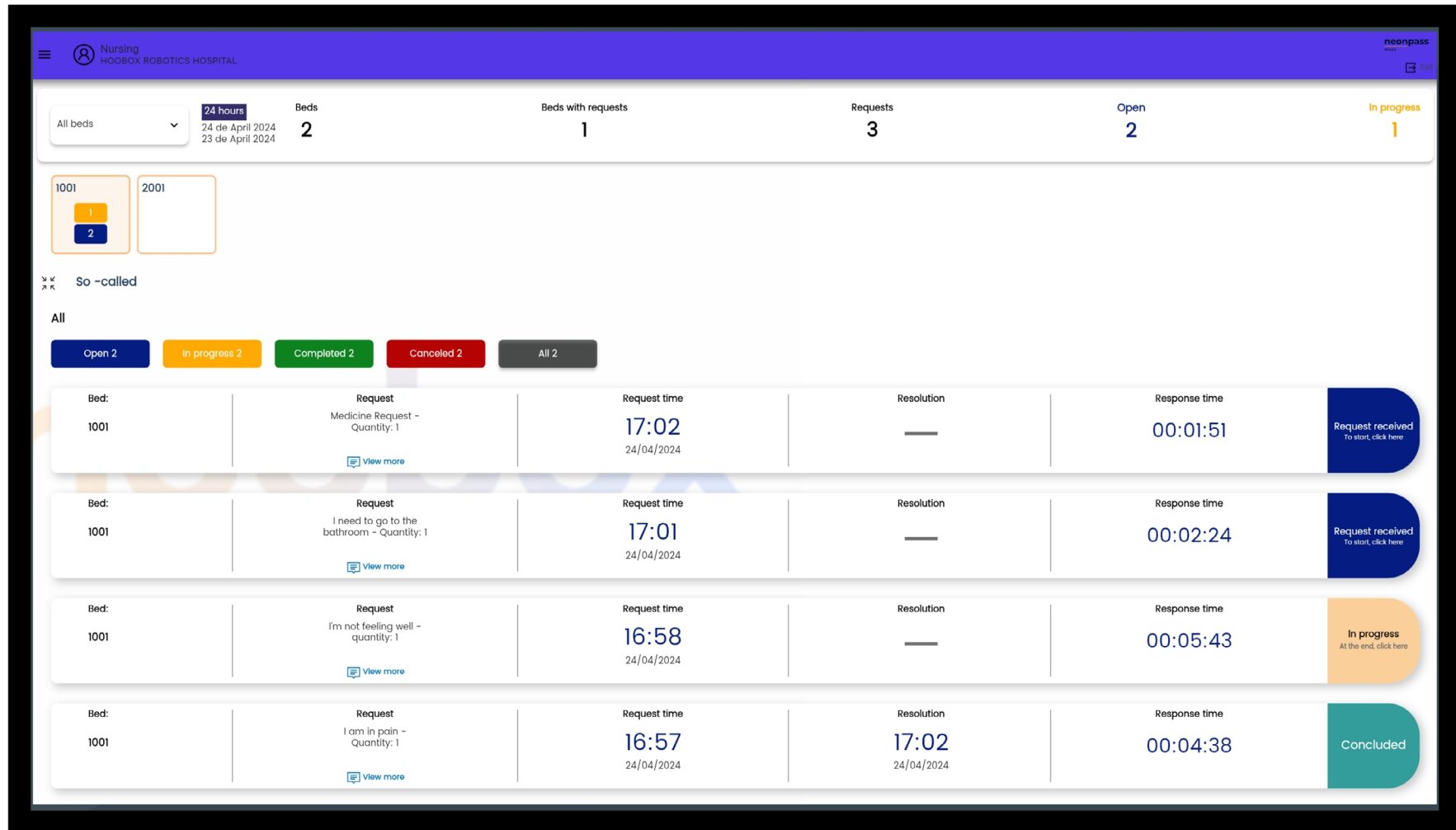
Figure 3 – Screen view of the multidisciplinary team interface.

A systematic review that synthesized the results of research on the nursing care experiences of patients and nurses, in all clinical practices, showed that different factors were identified as barriers to the care experiences of patients and nurses. Among these factors, patients felt that many nurses provided care in a "rushed" manner or demonstrated a lack of personal interest, impersonality, and even when they recognized individual needs, they were unable to meet demands due to work overload and lack of time. Noise from medical devices and loud conversations in the Intensive Care Unit (ICU) were also highlighted as factors that can reduce the feeling of being cared for. From the nurses' perspective, the heavy workload and work tasks that did not always need to be handled by nursing staff made it difficult to manage time for individualized care, which also physically and mentally exhausts professionals[23].

Studies highlight that the existence, use and benefits of digital technologies in nursing care are relevant topics in light of the discussion about technologies as possible solutions to problems such as the shortage of workers and the growing demand for long-term care[24].

Implementation

During the study, the product's main functionality was initially brought to the center of the implementation process: allowing the patient to make requests directly to the areas. Thus, the solution enables the patient to request both nursing and other areas in need, being able to require nursing care, such as communicating pain, finishing medication, needing care, and being able to demand from other areas. For example, when requesting replacement of water bottles, room cleaning, assistance with televisions, internet, requests for extra linen and others.

Secondly, in addition to receiving patient requests, the nursing team also had the ability to make the same patient requests to the cleaning, nutrition, maintenance and hospitality sectors through its own interface.

During implementation, employees from the sectors in which the solution was implemented received training with a total workload of 3 hours, using the tool in a simulated environment. In addition, a team member was chosen as a reference for questions, and a 24-hour contact channel was made available with the Hoobox Robotics team.

For the patients, as it is a technology already acquired by the hospital and not part of any project with a scientific bias at the time of admission, they and their family members were instructed on how to use the tool. This guidance was provided by the team that had been previously trained under the supervision of a member of the solution developer. It should be noted that the introduction of technologies in the healthcare area, including in the nursing area, can lead to concerns related to data bias in the context of algorithms, with potential implications for certain populations, considering that data can feed back into servers and not always return benefits to the populations from which the data were extracted[25].

Patients and professionals adhered to the tool positively during the study period. Care technologies have the potential to increase the quality of care and improve working conditions[26].

Calls made by patients and answered by professionals were compiled into data and stored in the cloud for archiving. The data generated by the tool was automatically shared over the secure institutional Wi-Fi network, and the data transfer met security assurance standards, such as encryption of data transferred from the tool to the data aggregation software. Microsoft Office Excel version 2010 aggregated data from Neonpass Room®, generating reports through the programming of this digital solution.

The data generated by the Neonpass Room® solution was aggregated within the Power BI tool, exported and tabulated by Microsoft Office Excel version 2010 software, with a descriptive analysis of the data performed based on tables and graphs, presenting absolute/relative frequencies and percentages.

Follow-up

A total of 496 patients treated at the local units of this study used the Neonpass Room®. The requests were directed to five different areas, with a total of 3089 activations.

The use of the tool involved 146 employees from the nursing, nutrition, hospitality, cleaning and maintenance areas, interacting through it on all shifts.

When analyzing the impact of using the solution, there was a predominance of requests for the nursing team (1029/33.3%), followed by nutrition (973/31.5%), as shown in Figure 4.

When taking into account the total (N=3089) of requests in the period analyzed, 66.7% (N=2060) of the requests were unrelated to the nursing team's performance, but they would have had intermediation of this nursing team without the assistance of the tool. The work overload of the nursing team occurs due to the various responsibilities and activities that demand something which is not restricted to direct patient care. Nurses, in particular, perform managerial and care functions in the organization of resources, such as control of materials and equipment, with a view to care management, which puts them at constant risk in terms of work overload. Therefore, implementing strategies which can support improvements and time management in the work context helps in both the quality of care and maintaining the professional's health[27]. Figure 5 shows the median response times to area requests (in minutes).

The results obtained in the 13-week follow-up assessment of the impact of the digital solution offered data that appear to meet the need of reducing the number of interruptions by the nursing team, which is a problem already highlighted in other studies[20,24]. However, the reasons which lead to interruption of nursing work can still be more fully explored. Furthermore, the findings suggest that a high number of activities mediated by the nursing team can be directly conducted through
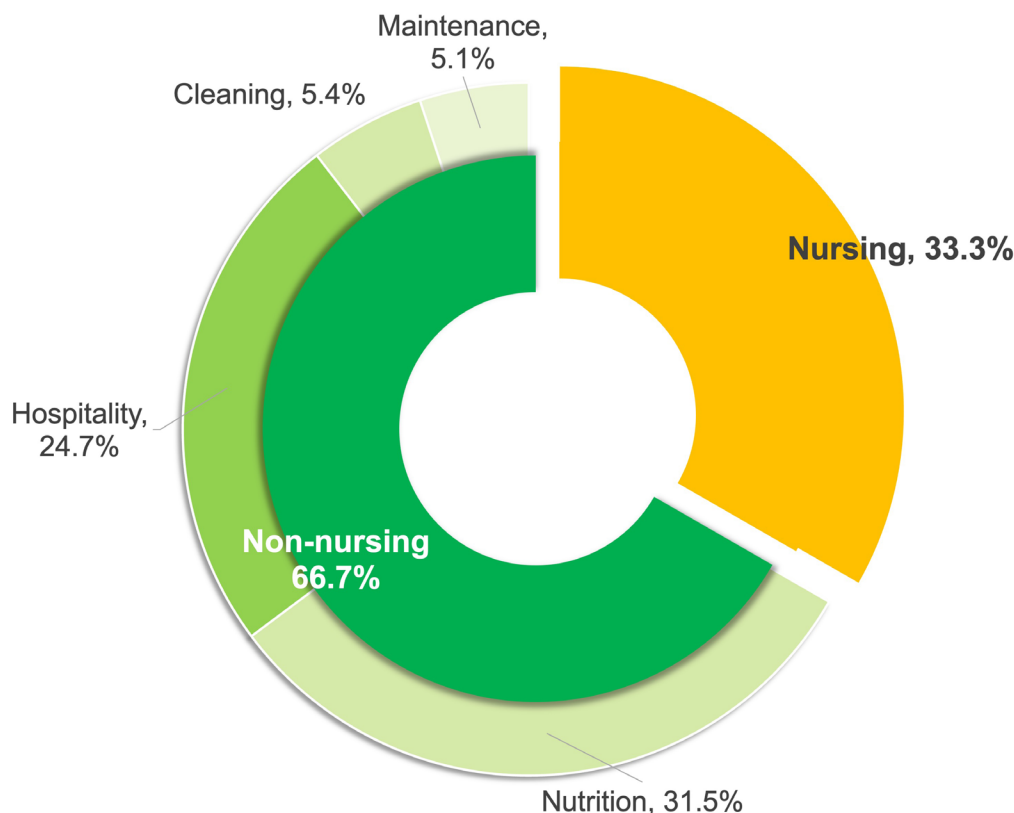

Figure 4 – Percentage of requests via Neonpass Room® by area.
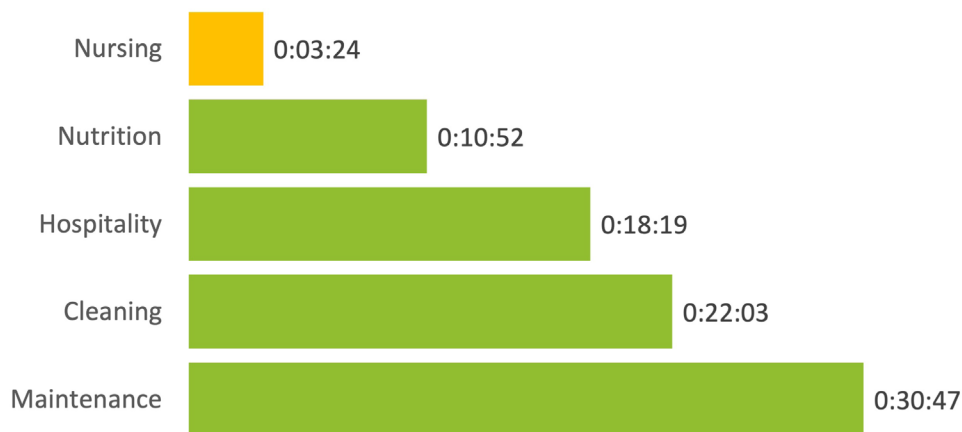
Figure 5 – Median service times in minutes by area.

the destination areas, delivering the same, or even higher levels of effectiveness to the patient. The adaptation of processes involving nursing with the help of technology has already been widely studied, with the use of electronic medical records being a milestone, with an impact (for example) on better outcomes for patient care and safety[14,15].

Technology-driven initiatives which include training and improving work processes as objectives can promote understanding of the roles of frontline workers in healthcare systems[28,29]. Studies which analyze the frequency of interruptions in the nursing work process, such as equipment alarms, calls from family members for various matters, as well as requests that could be met by other areas, such as cleaning and nutrition, describe that, in addition to the nursing professional's overload, there are also safety risks to patients and delays in clinical care management, such as tasks related to devices, omission of items from technical nursing procedure protocols[30].

This study has as a limitation the fact that it did not monitor the impact of the use of the tool from the nursing team's perception, mainly with regard to organizing processes which can benefit from the possible increase in time availability resulting from the use of the Neonpass Room® digital interface tool. It is worth noting that the full potential of the tool has not yet been fully explored, with several possibilities to be addressed later.

CONCLUSION

The Neonpass Room® tool has been shown to improve the efficient distribution of requests to the appropriate areas. Unlike traditional call buttons, the digital solution directed demands to nursing and governance areas, with clear specifications.

The relevance of this study lies in the detailed documentation of implementing and monitoring the digital tool, outlining all the steps and phases taken to achieve a successful implementation. The fact that there are no similar studies in national and international literature gives this study an innovative and valuable character. This production can be a source of guidance for the future implementation of digital solutions.

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