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FAST TRACK METHOD - IMPROVEMENTS IN EMERGENCY SERVICES DURING THE COVID-19 PANDEMIC

MÉTODO FAST TRACK - MELHORIAS NOS SERVIÇOS DE EMERGÊNCIA DURANTE A PANDEMIA DE COVID-19

MÉTODO FAST TRACK - MEJORAS EN LOS SERVICIOS DE EMERGENCIA DURANTE LA PANDEMIA DE COVID-19

ABSTRACT
Overcrowding in emergency services has been a severe public health problem in all continents and it was aggravated by the COVID-19 health crisis. Through a partnership between public agencies, it was possible to conduct projects in the 24-hour Emergency Care Units (24-hour ECU) in two consecutive cycles, in which the Fast Track Method (Patient Flow Management) was implemented. In this intervention study, we sought to answer guiding questions with data mining of 1,793 improvements (Good Practices – Kaizens) with the Fast Track Method. The objective was to analyze the implementation of the Fast Track method in the 24h ECUs. The results point to risk classification as a target for improving measures to protect patients and teams in cycle 1. In cycle 2, the improvements made included the work process and visual management to reduce the waiting time for care. It was concluded through data mining analysis that the guiding questions were answered

and that the implementation of the method contributed to reducing patients' length of stay and crowding, especially those caused by low acuity patients.

KEYWORDS: Total Quality Management. Emergency. Health Management. Data Mining. COVID-19.

RESUMO

A superlotação em serviços de emergência têm sido um grave problema de saúde pública em todos os continentes e têm se agravado com a crise sanitária da COVID-19. Por meio de uma parceria entre órgãos públicos, foi possível executar projetos nas Unidades de Pronto Atendimento 24 horas (UPA 24h) em dois ciclos consecutivos, nos quais implementou-se o Método Fast Track (Gestão do Fluxo do Paciente). Neste estudo de intervenção, buscou-se responder questões norteadoras com mineração de dados das 1.793 melhorias (Boas Práticas – Kaizens) com o Método Fast Track. Objetivou-se analisar a implementação do método Fast Track nas UPAs 24h. Os resultados apontam para a classificação de risco como alvo de melhorias em relação às medidas de proteção dos pacientes e equipes no ciclo 1. No ciclo 2, as melhorias realizadas contemplaram o processo de trabalho e a gestão visual para reduzir o tempo de espera pelo atendimento. Através da análise com a mineração de dados, concluiu-se que foram respondidas as questões norteadoras e que a implementação do Método Fast Track contribuiu com a redução do tempo de permanência dos pacientes e diminuiu as aglomerações, em especial aquelas causadas por pacientes com baixa acuidade.

PALAVRAS-CHAVE: Gestão da Qualidade Total. Emergência. Gestão em Saúde. Mineração de Dados. COVID-19.

RESUMEN

El hacinamiento en los servicios de emergencia ha sido un grave problema de salud pública en todos los continentes y se ha agravado por la crisis sanitaria del COVID-19. A través de una alianza entre organismos públicos, fue posible ejecutar proyectos en las Unidades de Atención de Emergencia 24 horas (UAE 24 horas) en dos ciclos consecutivos, en los que se implementó el Método Fast Track. En este estudio de intervención se buscó responder preguntas orientadoras con minería de datos de 1.793 mejoras (Buenas Prácticas – Kaizens) con el método. El objetivo fue analizar la implementación del método Fast Track en las UAE 24h. Los resultados apuntan a la clasificación de riesgo como objetivo de mejoras en relación a las medidas de protección de pacientes y equipos en el ciclo 1. En el ciclo 2, las mejoras realizadas incluyeron el proceso de trabajo y la gestión visual para reducir el tiempo de espera para la atención. Se concluyó mediante el análisis con minería de datos, que las preguntas orientadoras fueron respondidas y que la implementación del método contribuyó a reducir el tiempo de permanencia de los pacientes y reducir el hacinamiento, especialmente los causados por pacientes con baja agudeza.

PALABRAS-CLAVE: Gestión de la Calidad Total. Emergencia. Gestión en Salud. Minería de Datos. COVID-19.

1 INTRODUCTION

The pandemic caused by the Sars-Cov-2 virus affected millions of people worldwide. In Brazil, through the Unified Health System (Sistema Único de Saúde – SUS, in Portuguese), the Emergency Care Network has as its entry the 24-hour Emergency Care Units (24h-ECU).

Some theories that can be applied to overcrowding studies in emergency services include Queueing theory, Capacity theory, Quality theory, Supply and Demand theory, Total Quality Management

theory, and Lean Healthcare. These theories can be combined and applied in an interdisciplinary manner to solve the overcrowding problem in emergency services[1, 2].

According to the World Health Organization (WHO), overcrowding in emergency services is a global problem that affects the quality of care and increases death risk for patients. Overcrowding in healthcare facilities can spread infectious diseases and cross-contamination and should be avoided whenever possible[3].

Crowds in emergency services are situations where many people are in a specific location, usually seeking medical care or assistance. These agglomerations can be created due to many reasons, including natural events, epidemics or pandemics, and social or cultural events[4].

Faced with overcrowding situations in health services, medical decisions, such as triage and admission decisions, should be based on the severity and level of treatment required for the patient. However, these decisions should be unrestricted by overcrowding in the emergency department[5].

Given this and attempting to reduce the problems associated with overcrowding, the Brazilian Ministry of Health and the Fluminense Federal University implemented the project in the 24-hour ECUs to reduce patients' Length Of Stay (LOS) in the ECU and to manage resources more efficiently, reducing waste. For this, the DMAIC and Fast Track methods were used.

The execution of the projects took place in two cycles: the first from November 2019 to June 2021, and the second from October 2021 to April 2023. It is noteworthy that the first cycle of the project in the 24-hour ECUs coincided with the beginning of the period of the COVID-19 pandemic, but the design of the project preceded the event. This intervention study was carried out with the objective of analyzing the implementation of the Fast Track method in the 24-hour Emergency Care Units.

2 THEORETICAL FRAMEWORK

The COVID-19 health crisis caused by SARS-CoV-2 mobilized collective efforts to overcome emergency services worldwide and contributed to a redefinition of their dynamics in terms of efficiency in facing this problem.

In Brazil, there are health units that provide urgent and emergency care to the population and are intermediate to hospital and primary care. These units are called 24-hour Emergency Care Units (24-hour ECU) and are integrated into the SUS[6].

The Emergency Care Units (ECUs) are health facilities integrated with SUS, which aims to provide resolving emergency care to patients with acute clinical conditions and perform the first care to cases of surgical nature, stabilizing them[7].

Lean Healthcare has been spreading worldwide, with many hospitals and health systems adopting the approach to improve efficiency, reduce costs, increase patient safety, and improve the quality of care[8].

Lean is based on efficiency and continuous improvement principles and can help identify and eliminate waste in the care process, increase health team processing capacity, and improve the

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quality of care. In addition, it emphasizes employee collaboration and participation in problem-solving, which can help create more effective and sustainable solutions to the overcrowding problem[9].

The Fast Track method is also an effective strategy for managing overcrowding and task overload that health professionals should process. Fast Track aims to create a range where patients with the lowest acuity are treated, thus reducing the time they remain in the emergency service (LOS indicator). Since professionals can pay more attention to patients with acute diseases that need more attention to clinical and therapeutic decision-making, the method also reduces work overload and makes care more efficient[10,11].

The Fast Track method consists of actions regulated by resource sequencing and control planning, such as Shortest Operating Time (SOT), where small tasks are processed and directed to lower acuity patients, providing continuous flow[6].

All service ranges require a risk classification protocol, systematized at priority levels and standardized to all emergency service employees[12,13].

In Brazil, the Brazilian Society for Traumatized Integrated Care (SBAIT, in Portuguese) adapted the Risk Classification Protocol to meet the characteristics and demands of Brazilian emergency services[14].

Lean Best Practices or Kaizens are a vital part of Lean, where processes are analyzed and optimized to increase efficiency and reduce costs. This is achieved through a culture of collaboration, communication, and constant search for improvement[15].

The R interface for multidimensional analyzes of texts and questionnaires (IRAMUTEQ, in French) software uses the R system, which allows data mining, the analysis of classic textual statistics, word cloud, and similar analysis with the identification of patterns and trends in the analyzed data[16].

This study was carried out to better understand the flow of patients in emergency services during the health crisis, particularly the problem of crowding in emergency services due to high demand.

The importance of understanding the flow related to the health crisis showed in this study the effectiveness of using the Fast Track method to reduce the waiting time for these services.

The results of this study helped to demonstrate how the community around the emergency services and the workers benefited from the improvements made in these services when applying the Fast Track method. These improvements were made possible through the training of professionals who work in emergency services.

Furthermore, the data mining carried out in this study using the IRAMUTEQ software clarifies from a scientific perspective that statistical treatment can be used to analyze large amounts of data qualitatively, allowing to recognize relationships and identify patterns.

3 METHODOLOGY

Through the partnership between the Ministry of Health and the Fluimnese Federal University, projects were carried out in the 24-hour ECUs, which resulted in interventions performed by teams during the 2019/21 period for cycle 1 and 2021/23 for cycle 2, distributed in 17 federative units (states) and the Federal District.

This is an intervention study in which the Standards for Quality Improvement Reporting Excellence (SQUIRE) checklist was applied. The interventions correspond to the improvements made in the 24-hour ECUs, which were registered through the Lean Practices in the 24-hour ECUs Application, and enabled the creation of an electronic spreadsheet with information about each of the 1,793 improvements carried out (Best Practices - Kaizens). The information collected for the database was: the title, objective, and situation description after implementing the improvement in the 24-hour ECUs. The database underwent adaptation to be processed in the IRAMUTEQ software.

All the records of the improvement reports were read in an electronic spreadsheet and the terms were standardized to be processed in the IRAMUTEQ, according to its manual. The spreadsheet was converted into a txt file according to the software requirements, to be read in Unicode-8 format. Once this was done, the file was uploaded to the software, and the parameterization was chosen in the software.

The software presented some analyzes such as Zipf's law, Correspondence Factor Analysis, Descending Hierarchical Classification, and Word Cloud. These analyzes helped to interpret the results of the reports more dynamically and to present them in an accessible way.

To reach the objective of this study, the following guiding questions were constructed: How was the "fast track" described, and what were the conditions under which it occurred? How did the environment affect the "fast track"? Who was involved in the "fast track", and how were they impacted? How did the "fast track" affect the people and the 24-hour ECU involved?

4 DISCUSSION AND ANALYSIS OF RESULTS

When processing the cycle 1 and 2 databases, it was verified that the percentages were above the minimum 70% necessary to consolidate the results when processing the data in the IRAMUTEQ software[16].

Table 01 - Text Segments (TS) and Percentage of TS classified in Cycles 1 and 2 – Brazil – 2021-2022

Cycle	TS	TS classified	
		frequency	%
Cycle 1	747	703	94.11
Cycle 2	1,387	1,287	92.79
Cycles 1 and 2	2,134	1,990	98.03

Source: Authors, 2022.

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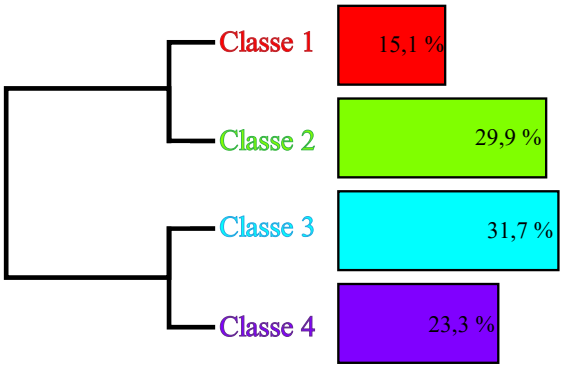
4.1 Fast Track application description and conditions

The Descending Hierarchical Classification (DHC), graphically represented in the dendrogram in Figure 1, shows that the text segments were grouped into four classes based on the similarity between the segments, which were named: Flow Management (Fast Track, 15.1%), Risk Classification (29.9%), Improvements (31.7%), and Team and Patient Safety (23.3%). The dendrogram also shows that classes were formed based on the distance between segments, i.e., the closest segments were grouped.

Figure 1 - DHC Dendrogram



Source: Authors, 2022.

Class 1: Flow Management (Fast Track) was identified as the target of service flow improvements in both cycles. In the first cycle, improvements were to ensure social isolation by implementing visual management and demarcations, e.g., markings on chairs and track strips on the floor to guide the flow. In the second cycle, the safety measures related to the flow were maintained without the same emphasis as the previous cycle. Fast Track was used to improve patient care flow management in both cycles.

Class 2: Risk Classification. The improvements made in this Class were to protect patients and teams in cycle 1. In contrast, in cycle 2, the improvements made included the work process and visual management to reduce the waiting time for care. These results show that Fast Track effectively reduced waiting time and improved risk classification.

Class 3: It was identified as the Improvement Class, as the activities carried out in this Class were related to continuous improvement measures, such as implementing standardized work processes, visual management, and monitoring results. These measures have been implemented to ensure optimized work processes and continuous improvement by monitoring results. These improvements focused on the health crisis in cycle 1, which reinforced measures to protect patients and teams. In cycle 2, most of the improvements were actions to the management of equipment and qualified personnel infrastructure.

Class 4: Team and Patient Safety. These Class improvements were related to the quality of care, such as the implementation of standardized work processes, visual management, and monitoring of

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results. These measures have been implemented to ensure optimized work processes and monitored results to guarantee continuous improvement in the quality of care in cycle 1. In contrast, in cycle 2, the improvements made included using Personal Protective Equipment (PPE) by the teams, such as facemasks.

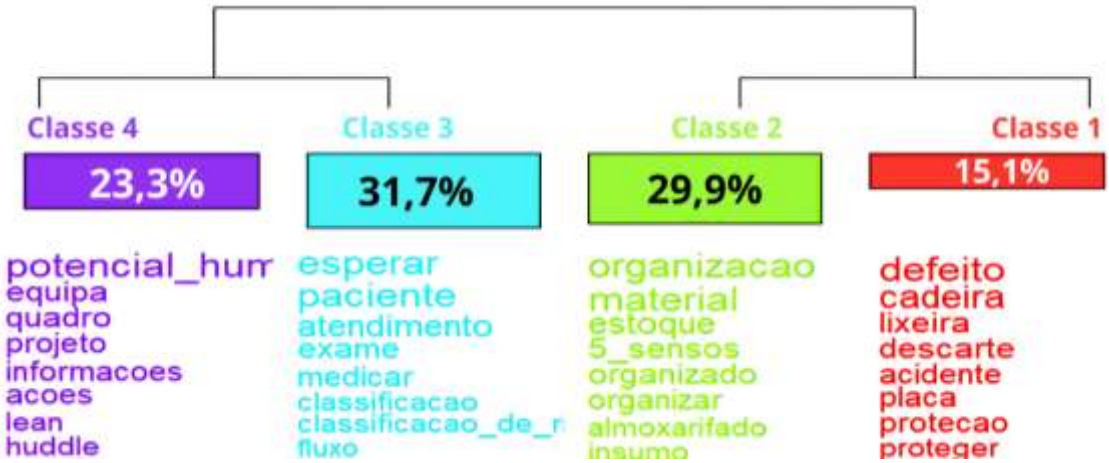
4.2 Impact of the Environment on Fast Track

The indicators that confirm the results obtained by implementing Fast Track in the two cycles include the reduction in waiting time for service, the decrease in crowds, the improvement of risk classification, the improvement in the management of equipment use, and the qualification of collaborators.

Fast Track was described as a method that contributes to the reduction of crowding, especially those caused by patients with low acuity or classified in green. The environment affected Fast Track by imposing social isolation restrictions, which resulted in an increase in demand for care. People involved in Fast Track were affected by protective measures against COVID-19, such as the use of PPE and social distancing.

In Figure 2, the main words of each of the classes were identified and appeared in the analyzed TSs. Words or phrases were identified in the TSs that guided the reading of the improvements implemented in each of the two cycles. This allowed for building a more accurate analysis of the Fast Track results.

Figure 2 - Filogram of Cycles 1 and 2 DHC of the Project in the 24-hour ECUs.



Source: Authors, 2022.

According to the similarity tree formed through the DHC, the nucleus contains the words “Fast Track” centralized with the words “Attendance” below and above, in larger size the word “Patient.” In this similarity tree, we can confirm how much the Fast Track Method is at the center of decisions about improvements in patient care aimed at reducing the Length of Stay (LOS) since the word “Wait” also appears attached to the word “Patient”.

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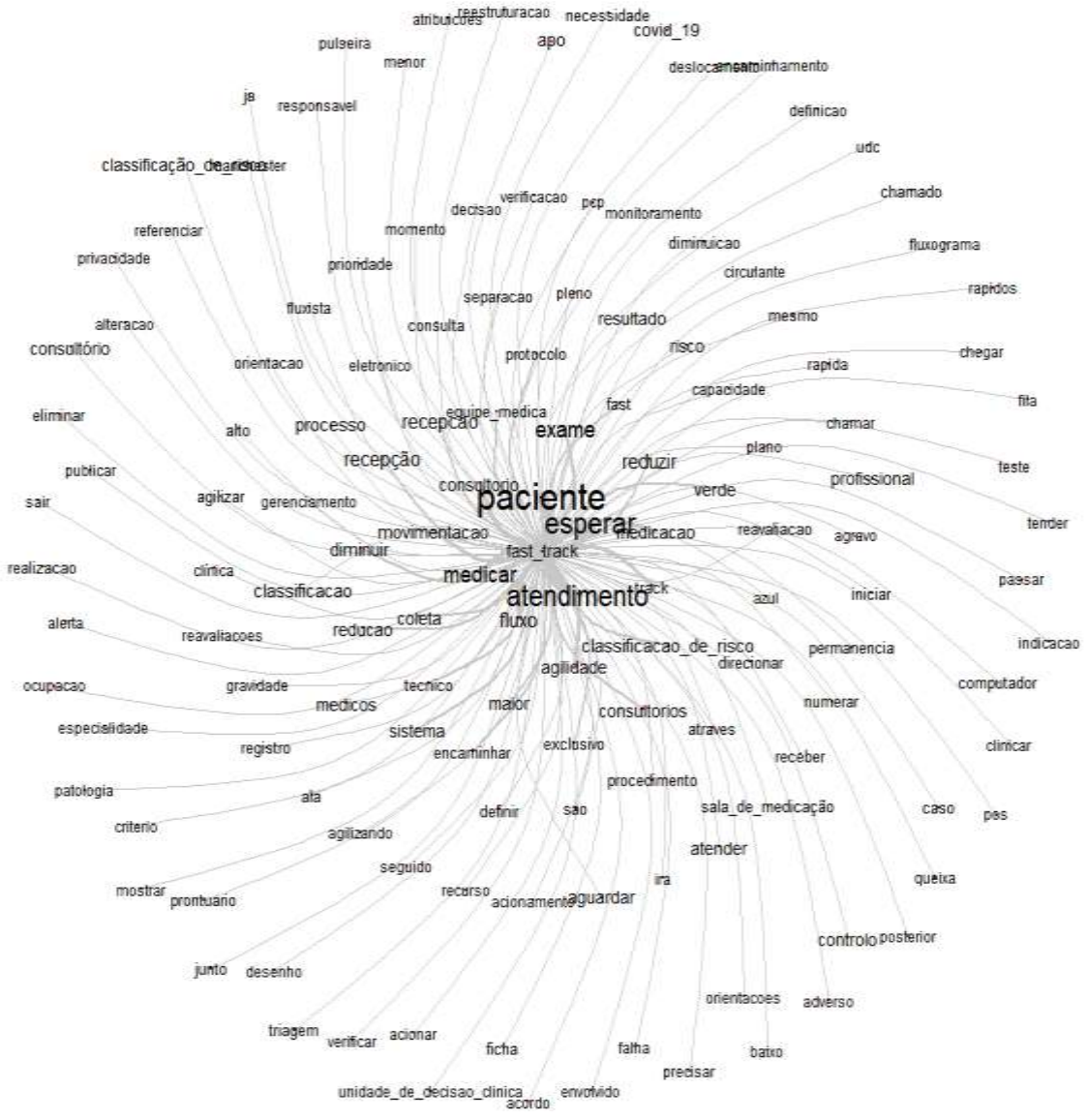
Figure 3 - Similarity tree (Fast Track)



Source: Authors, 2022.

In the first cycle, improvements were aimed at ensuring social isolation, with markings on chairs and track strips on the floor to guide the flow, present in most of the 24-hour ECUs. In the second cycle, with the arrival of vaccination against COVID-19, the safety measures related to the flow were maintained, though without the same emphasis as in the previous cycle, as seen in the analysis matrix.

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The Fast Track method demands flow control and patient care sequencing, especially for low-acuity patients or patients with a green risk classification.

In cycle 2, the implementation of Fast Track was centered on administrative measures regarding the control of the patient's LOS during care and the infrastructure to ensure the operation of the flow. Per the managers' recommendations, the protective measures against COVID-19 remained, using PPE and social distancing. The improvements in the flow changed the focus due to the vaccination coverage against COVID-19.

4.3 Fast Track's impacts on people

Correspondence Factor Analysis (CFA) presented a Cartesian plane to represent the distribution of words in the textual corpus. Their association with the main factors identified in the analysis and the size of the words in the Cartesian plane can indicate their relative frequency in the texts. Words are then assigned to quadrants based on their proximity to these critical factors.

Correspondence Factor Analysis showed that the four classes are represented in the Cartesian plane, as shown in Figure 4.

Figure 4 - Correspondence Factor Analysis (CFA)

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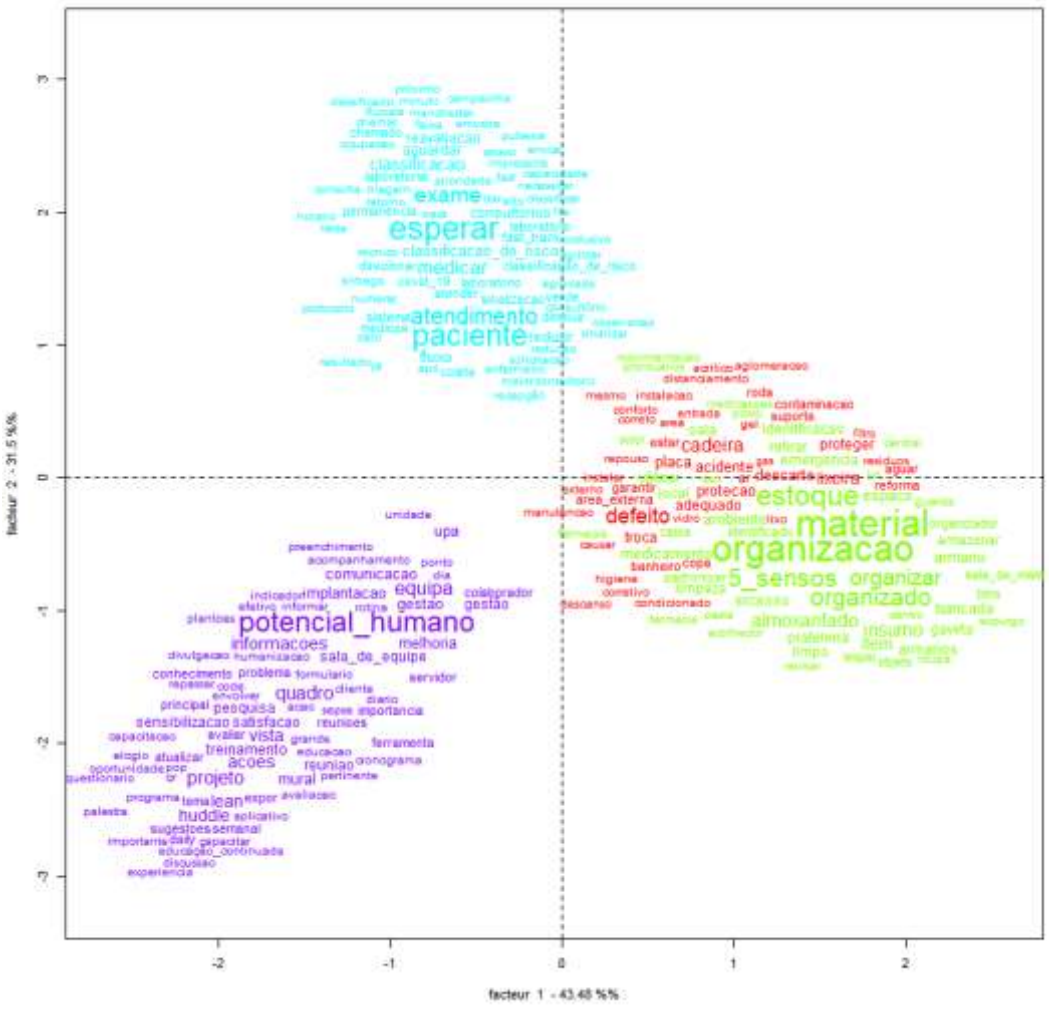

Source: Authors, 2022.

The Cartesian plane presents the predominance of words from Class 3 (Improvements; light blue) in the upper left quadrant, with some words in the upper right quadrant. Class 1 (Flow Management; red) predominates close to the ordinate axis. Class 2 (Risk Classification; light green) words are distributed in the upper and lower right quadrants, predominating the lower right quadrant, and appearing mixed with those from Class 1. The words from Class 4 (Team and Patient Safety; purple), were concentrated in the lower left quadrant.

The CFA of the four classes represented in the Cartesian plane contributed to understanding the interrelationship between these classes. In the upper left plane, with the predominance of Class 3 (Improvements), the words “Waiting” and “Patient” stand out, considering that the improvements were directed towards reducing the waiting time for patient care.

Class 1 (Flow Management) and Class 2 (Risk Classification), show how necessary it is to implement Fast Track to make improvements in the flow management process and the risk classification. The improvements aimed at the organization and standardization of risk classification processes

contributed to the implementation of Fast Track, as the words that make up these two classes are correlated.

Class 4 (Team and Patient Safety) is represented in the Cartesian plane, isolated in the lower left quadrant. This representation confirms how much improvements were directed towards problems related to the COVID-19 pandemic in cycle 1 and how much remained significantly in cycle 2, as security measures began to receive more attention from professionals in healthcare.

5- CONCLUSION

The application of the Method contributed to the understanding that Fast Track was described as a strategy to reduce the waiting time of patients in the reception of the Emergency Service, and to ensure attendance to all, even to low acuity patients. Furthermore, during the height of the pandemic, Fast Track shows that, despite the high demand, it can reduce the LOS for patients and overload for teams, and it is sustainable after the world health crisis, with the unit's normal demand met by trained professionals.

In cycle 1, the main improvements were aimed at ensuring social isolation, with markings on chairs and tracks on the floor to guide the flow. In cycle 2, the safety measures related to the flow were maintained, without the same emphasis as in the previous cycle. In addition, the improvements made in cycle 2 included the work process and visual management to reduce the waiting time for care and the teams' use of Personal Protective Equipment (PPE).

The Descending Hierarchical Classification revealed that the sorting and visual management sectors were the ones that obtained the most significant number of improvements in cycles 1 and 2, respectively. The Correspondence Factor Analysis showed that the four classes are represented in the Cartesian plane, which allowed the analysis of text segments on risk classification and Fast Track, described by the 24-hour ECU teams in cycles 1 and 2.

Fast Track has been described as a method that contributes to crowding reduction, especially caused by patients with low acuity or those classified in green. The circumstances surrounding it were the arrival of the COVID-19 vaccination, the safety measures related to the flow, the use of Personal Protective Equipment (PPE), and the risk classification.

Fast Track was influenced by the environment in which it took place, as protective measures against COVID-19 remained, with the use of PPE and social distancing, by the recommendations issued by the managers of the 24-hour ECUs. In addition, flow improvements have shifted focus due to vaccination coverage against COVID-19.

Those involved in Fast Track were patients, health teams, and managers. Patients were affected by protective measures against COVID-19, with the use of facemasks and social distancing. Health teams were affected by improvements in flow, which shifted focus due to vaccination coverage against COVID-19. Managers were affected by the recommendations made for measures to protect patients and staff.

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The 24-hour ECUs were also affected by the improvements, as the risk classification was the target of improvements in relation to the measures to protect patients and teams in cycle 1. In cycle 2, the improvements made included the work process and visual management to reduce waiting time for care.

Once the guiding questions were answered, the objective of analyzing the implementation of the Fast Track method in the 24-hour Emergency Care Units was reached based on the systematic analysis of the results recorded in the database processed by the IRAMUTEQ software. This allowed expanding the range of discussions to be respectful of standardized work for risk classification as the basis for implementing the Fast Track method.

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