

Infographics as educational technology aimed at preventing health-related infections: an experience report

Infográficos como tecnologia educacional direcionada à prevenção de infecções relacionadas à saúde: um relato de experiência

Infografías como tecnología educativa dirigida a la prevención de infecciones relacionadas con la salud: un relato de experiencia

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ABSTRACT: Objective: To develop infographics as an educational technology to encourage good practices in safe surgery and prevention of healthcare-related infections. **Method:** Experience report on the production of informative infographics that present care indicators collected in epidemiological surveillance, carried out by the Hospital Infection Control Service of a private hospital in Porto Alegre, Rio Grande do Sul. The Plan, Do, Check, and Act (PDCA) management tool led the creation steps, with the infographics subsequently being created using the Canva[®] platform. **Results:** Infographics aimed at the Surgicenter and Post-Anesthetic Recovery Room sectors were planned in a playful way, with accessible language and attractive visuals, aiming to capture the attention of professionals, following standards from the National Health Surveillance Agency (*Agência Nacional de Vigilância Sanitária* – ANVISA). The infographics were printed and distributed in the sectors, helping to disseminate data and clarify frequently asked questions and encouraging ongoing education. **Conclusion:** The educational technology in infographic format was well accepted by the institution's professionals, allowing them to quickly and accurately inform and clarify doubts about care indicators and encouraging good practices in safe surgery and prevention of health-related infections. **Keywords:** Cross infection. Health education. Infection control. Health care team. Infographics.

RESUMO: Objetivo: Desenvolver infográficos como tecnologia educacional para estimular boas práticas de cirurgia segura e prevenção das infecções relacionadas à assistência à saúde. **Método:** Relato de experiência sobre a produção de infográficos informativos que apresentam indicadores assistenciais coletados na vigilância epidemiológica, realizada pelo Serviço de Controle de Infecção Hospitalar de um hospital particular de Porto Alegre (RS). A ferramenta de gestão *Plan, Do, Check e Act* (PDCA) conduziu as etapas de criação, sendo os infográficos posteriormente elaborados com o uso da plataforma Canva[®]. **Resultados:** Infográficos direcionados aos setores Centro Cirúrgico e Sala de Recuperação Pós-Anestésica foram planejados de forma lúdica, com linguagem acessível e visual atrativo, visando captar a atenção dos profissionais, seguindo normas da Agência Nacional de Vigilância Sanitária (ANVISA). Os infográficos foram impressos e distribuídos nos setores, contribuindo para divulgar dados e esclarecer dúvidas frequentes e estimulando a educação permanente. **Conclusão:** A tecnologia educacional em formato de infográficos foi bem aceita pelos profissionais da instituição, permitindo, de forma rápida e acurada, informar e esclarecer dúvidas sobre indicadores assistenciais e estimulando boas práticas de cirurgia segura e prevenção de infecções relacionadas à saúde. **Palavras-chave:** Infecção hospitalar. Educação em saúde. Controle de infecções. Equipe de saúde. Infográficos.

RESUMEN: Objetivo: Desarrollar infografías como tecnología educativa para fomentar buenas prácticas quirúrgicas seguras y prevención de infecciones relacionadas con la atención sanitaria. **Método:** Relato de experiencia sobre la producción de infografías informativas, que presentan indicadores

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de atención recogidos en la vigilancia epidemiológica, realizada por el Servicio de Control de Infecciones Hospitalarias de un hospital privado de Porto Alegre, Rio Grande do Sul. La herramienta de gestión PDCA (*Plan, Do, Check and Act*) lideró las etapas de creación, y las infografías fueron posteriormente elaboradas utilizando la plataforma Canva®. **Resultados:** Se planificaron infografías dirigidas a los sectores “Centro Quirúrgico” y “Sala de Recuperación Postanestésica” en forma lúdica, con un lenguaje accesible y elementos visuales atractivos, con el objetivo de captar la atención de los profesionales, siguiendo los estándares de la ANVISA. Las infografías fueron impresas y distribuidas entre sectores, contribuyendo a difundir datos y aclarar dudas frecuentes y fomentar la educación continua. **Conclusión:** La tecnología educativa en formato infográfico tuvo buena aceptación por los profesionales de la institución, permitiéndoles informar y aclarar dudas sobre indicadores asistenciales de manera rápida y precisa, y estimulando buenas prácticas de cirugía segura y prevención de infecciones relacionadas con la salud.

Palabras clave: Infección hospitalaria. Educación en salud. Control de infecciones. Grupo de atención de la salud. Infografías.

INTRODUCTION

Historical figures such as Dr. Ignaz Semmelweis (1818–1865) and nurse Florence Nightingale (1820–1910) pioneered the concepts and scientific investigation of safe patient care practices¹. In Brazil, the first Hospital Infection Control Committee (HICC) was established in 1963 at the Ernesto Dornelles Hospital in Porto Alegre, predating existing legislation on the topic. This initiative paved the way for subsequent Infection Control Services (HICS), tasked with infection control, prevention, and indicator management².

Healthcare-associated infections (HAIs) escalate healthcare costs, prolong hospitalizations, and elevate morbidity and mortality rates³. Presently, devising strategies to prevent HAIs stands as a paramount challenge for healthcare institutions, demanding dynamic models that necessitate continual updates and assessments⁴.

Epidemiological surveillance (ES) of HAIs aims to scrutinize data crucial for health institutions to mitigate harm and manage infections⁵. Through ES, institutions can diagnose units, delineate strengths, pinpoint areas for enhancement, and formulate strategic planning⁴.

A robust and dedicated HICS must: assess precautions and isolation, establishing protocols to curb the transmission of multi-resistant microorganisms⁶; evaluate and implement bundle routines for ventilator-associated pneumonia, primary bloodstream infections, and urinary tract infections stemming from indwelling urinary catheters; conduct surveillance of surgical site infections through post-discharge follow-ups and review of microbiological test results; and enforce best practices for safe surgery⁴.

In light of this situation, HICS should disseminate information to foster ongoing enhancement of HAIs prevention and control strategies⁵. To ensure that professionals grasp

these data effectively, it is crucial to develop educational materials that facilitate the visualization of concepts and the transmission of complex information in a readily understandable manner⁵.

The term “infographic” stems from the fusion of “information” and “graphic,” encapsulating the concept of visually representing information. It serves as a tool to convey complex information in a straightforward manner, simplifying comprehension. Infographics find utility in technical documents necessitating rapid and lucid explanations⁷. As digital technologies burgeon, the use of infographics becomes ever more vital and impactful, facilitating the dissemination of information in a more accessible manner⁸.

While undergoing an extracurricular internship as part of the HICS team at a general hospital, the primary researcher discerned the imperative to swiftly and effectively disseminate information to frontline professionals. Frequently encountering comprehension gaps and difficulties in conveying numerical data, particularly evident during education and training endeavors, the researcher recognized the necessity for an accessible educational technology to facilitate seamless data transmission.

OBJECTIVE

To report the development of informative infographics for good practices in safe surgery and prevention of healthcare-related infections.

METHOD

This report details the experience of a Nursing academic intern in developing infographics using publicly available

data. No specific health institution is mentioned, and the project did not require approval from the Research Ethics Committee.

This initiative was guided by the four-step management tool Plan, Do, Check, Act (PDCA)⁹. Chart 1 outlines the tool’s application, detailing each step undertaken.

The project was implemented within the scope of the HICS of a large private hospital located in Porto Alegre, Brazil, which currently operates with 312 general beds. The HICS, established in accordance with health surveillance guidelines, operates under the directives of HICC, aimed at preventing or minimizing the occurrence and severity of hospital-related infections. The infographics developed by HICS were distributed across various departments within the hospital, including five inpatient units, two Intensive Care Units, one Special Care Unit, one emergency room, one Recovery Room, and the Surgicenter (SC).

The target population for this initiative comprised the nursing care team and other professionals operating within the hospital environment, including 698 nursing technicians, 12 nursing assistants, 147 nurses, and 119 doctors. The HICS team consisted of three nurses specializing in infection control, an infectious disease doctor, a pharmacist, and an academic nursing intern.

RESULTADOS

The initial phase of development, the planning stage (Plan), commenced in October 2021 amid the pandemic. During this period, concerns arose regarding the comprehension of the data collected by HICS among healthcare professionals. Reports indicated difficulties in interpreting the numerical data presented in the reports to departmental managers.

Chart 1. Tool used.

PDCA steps	
Plan	Perception of the difficulty of access to information by healthcare professionals about HICS data and literature review
Do	Production of infographics on the Canva online platform
Check	Review and validation of content with the HICS team
Act	Implementation of suggested changes and distribution of materials to units.

PDCA: Plan, Do, Check, Act; HICS: Infection Control Services.
Source: Research data, 2022.

The assessment revealed a lack of awareness regarding HAI rates in care units and highlighted the necessity for comprehensive and accessible dissemination of data compiled by HICS. Moreover, there was an identified gap in the ongoing and permanent education of teams, necessitating intervention in these processes, particularly due to the high turnover of human resources during this period. Simultaneously, a literature review was conducted to provide a theoretical framework for the initiative. At this juncture, it was determined that infographics would serve as the preferred informational and educational tool due to their practicality and cost-effectiveness, aimed at addressing team inquiries and ensuring widespread access to information.

The subsequent phase, termed “Do”, occurred between November and December 2021. During this period, two infographics were developed, incorporating data derived from the epidemiological surveillance conducted by HICS within the Surgicenter and the Post-Anesthetic Recovery Room, adhering to guidelines outlined in ANVISA technical standards. To create these infographics, the visual editing platform Canva[®] was utilized. It offers a user-friendly interface and a diverse array of graphical elements, shapes, and fonts, available for free with certain limitations. Additionally, the platform allows for the export of files in PDF, PowerPoint, JPEG, and PNG formats.

The titles of the infographics were crafted to capture professionals’ attention and spark interest in reading. Utilizing easily comprehensible language and incorporating acronyms commonly recognized in the healthcare sector, the infographics were designed to be accessible and engaging. Structured with concise text segments and illustrative images, they aimed for clarity and visual appeal. The design featured the hospital’s signature blue and white color scheme for branding consistency. Images sourced from Canva[®]’s online library, including those specifically curated for health-related content, were utilized to enhance the visual presentation.

The use of the Canva[®] website adhered to copyright regulations, which permit academic use without commercial intent or promotion of registered trademarks. As the infographics are based on monthly data from HICS and are updated by the 15th of the subsequent month, no external references were necessary. Each infographic is updated by the HICS reference nurse, overseeing their respective care area, who participated in the creation of the product.

During the third stage (Check), conducted in January 2022, the infographics underwent review by the HICS nursing team, consisting of three nurses specializing in infection control. Following corrections, the content of the infographics was validated through consultation with HICS professionals, ensuring accuracy and clarity. Subsequently, the infographics were distributed across the various care areas.

During the final stage (Act), which occurred in March 2022, adjustments were implemented based on technical notes provided by HICS professionals and feedback from care staff. These adjustments were incorporated into the final artwork, which was subsequently approved by the HICS nursing team. The infographics were then printed on A3 paper and strategically placed in various locations within the hospital's care units.

Figures 1 and 2 display the infographics containing data compiled by the HICS from the Surgicenter and the Post-Anesthetic Recovery Room, respectively.

With the interventions implemented at the hospital, there was a noticeable improvement in healthcare professionals' adherence to hand hygiene (HH). The adherence

rate increased from an average of 40% in the second half of 2021 to 60% in the first half of 2022. This increase can be attributed to the interventions implemented at the institution, including the availability of infographics.

DISCUSSION

HAI is the outcome of the interplay of three elements: a susceptible host — the patient; a pathogenic microorganism — the source; and a mode of transmission — healthcare professionals. HICS undertakes actions aimed at directly or indirectly disrupting the progression or perpetuation of this chain^{10,11}. Therefore, ongoing updates, training, and access to information on the subject are indispensable¹². Utilizing informative infographics facilitates educational and explanatory endeavors, effectively linking information with visual aids¹³.

The practice of HH is widely recognized as the most effective measure for mitigating the transmission of HAIs. However, its adherence within hospital settings typically falls below 50% in most healthcare institutions. These statistics are directly correlated with a lack of motivation, overwhelming

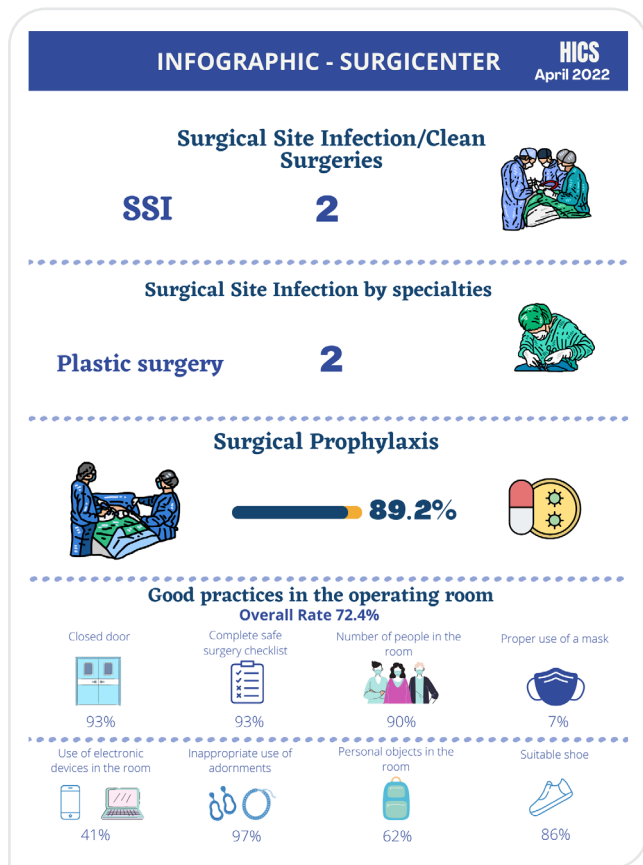


Figure 1. Surgicenter infographic.

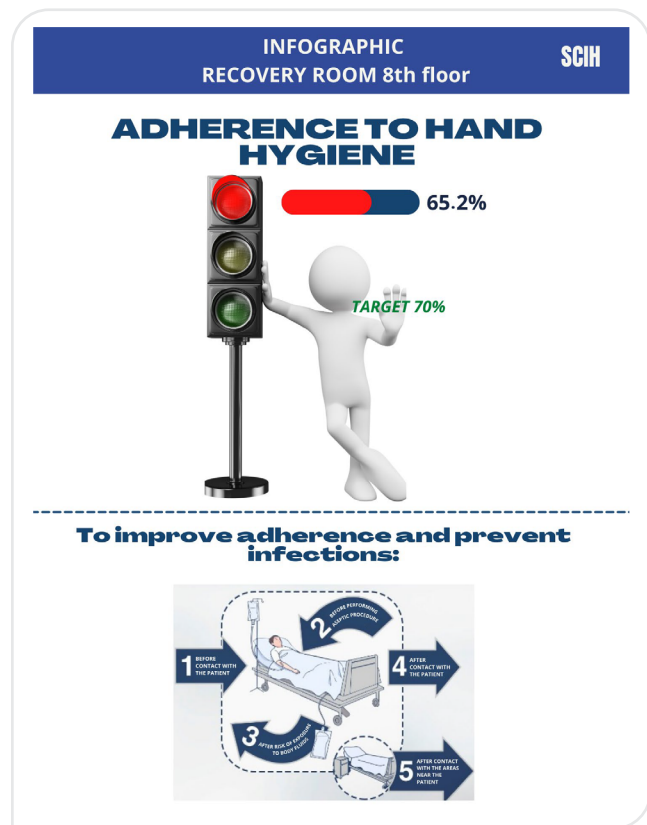


Figure 2. Post-anesthesia recovery room infographic.

workload, insufficient supplies, and/or deficiencies in the institution's physical infrastructure⁴.

In 2020, the World Health Organization (WHO) provided downloadable infographics on its website covering various topics, including fundamental measures for infection prevention: HH. These infographics demonstrate the correct procedures for HH, highlighting its significance for both individual and collective protection¹⁴. Consequently, the creation of educational materials becomes imperative for effectively disseminating this critical information.

The developed infographics offer healthcare professionals insights into their unit's status, emphasizing areas that need improvement according to HICS standards, as well as positive aspects. These materials were crafted to be concise and engaging, fostering greater involvement in delivering comprehensive patient care. The goal of the infographics is to share data compiled by HICS while considering the unique characteristics of each area. They serve as monthly snapshots of each unit, updated regularly.

The literature review conducted to create the infographics enabled the HICS team to refresh their indicators, reinforcing essential measures and prompting an assessment of weaknesses within the department that require attention. Identified training needs were communicated to HICS and conveyed to those responsible for each unit managers and Management for further action.

Following is the Surgicenter Infographic (Figure 1), illustrating the rates of surgical site infections in clean surgeries categorized by surgical specialty. These infections represent common and costly complications for the healthcare system. Additionally, the infographic presents data on surgical prophylaxis and the adherence rates to good practices in the surgical suite. Good practice refers to procedures that, when implemented with appropriate concepts, correct techniques, or methodological procedures, yield positive outcomes for the patient without causing harm. It is incumbent upon the healthcare team to monitor, assess, and ensure full compliance with good practices.

A good practice is defined as one that, employing appropriate concepts, correct techniques, or methodological procedures, yields positive outcomes for patients without causing harm¹⁵. Therefore, it is the responsibility of the healthcare team to diligently observe, assess, and guarantee adherence to good practices in their entirety¹⁶.

In conclusion, the Recovery Room Infographic (Figure 2) focuses on the unit's HH rates. This strategy aims to educate healthcare professionals about the importance of this activity,

fostering its integration into daily routines and emphasizing patient safety. In essence, these initiatives serve an informative purpose, promoting continuous education and the evolution of practices^{4,17}.

One limitation of this work is that the material was validated solely by the responsible managers, without validation from care professionals.

CONCLUSION

The production and availability of infographics in hospital units, conveying epidemiological data collected by the HICS, led to a decrease in inquiries from care teams regarding doubts about the reported indicators to the HICS. Moreover, the infographics promote good practices in safe surgery and the prevention of HAIs, thus aiding in their reduction.

It is hoped that this report will inspire other health institutions to adopt accessible educational technologies that convey data in an engaging and playful manner, thereby encouraging viewing and reading.

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None.

CONFLICT OF INTERESTS

The authors declare no conflict of interests.

AUTHORS' CONTRIBUTIONS

PMH: Project administration Formal analysis, Conceptualization, Data curation, Investigation, Methodology, Resources, Writing – original draft, Writing – review & editing, Software, Supervision, Validation, Visualization. KFF: Project administration, Methodology, Resources, Writing – original draft, Writing – review & editing, Supervision, Validation, Visualization. GBS: Project administration, Formal analysis, Data curation, Investigation, Resources, Writing – review & editing, Validation, Visualization. RCAC: Project administration, Formal analysis, Conceptualization, Methodology, Resources, Writing – original draft, Writing – review & editing, Supervision, Validation, Visualization.

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