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Adherence and incentive strategies for hand hygiene in endoscopy: integrative review

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Abstract

Introduction
Hand hygiene in endoscopy is still a topic addressed in a limited way in the literature, with predominantly unicentric studies and small sample sizes, lacking a synthesis of evidence. This limitation prevents a comprehensive evaluation of adherence and incentive strategies, which justifies conducting this review.

Objective
To identify, through literature, the adherence and incentive strategies for hand hygiene in the endoscopy sector.

Methods
This is an integrative review conducted on databases including PubMed, Scopus, Web of Science, LILACS, BDENF, WPRO, CAPES Periodicals Portal, and the SciELO library. For the selection of articles, the inclusion criteria established were: full texts available for free and/or for purchase, with no time restrictions, and published in English, Portuguese, or Spanish. To maintain methodological rigor during the search strategy, a double-blind selection of articles was independently conducted.

Results
A total of 204 publications were retrieved, with the final sample consisting of six studies. Of these, only two addressed adherences to hand hygiene in the endoscopy sector. Regarding incentive strategies, all publications highlighted educational interventions, the implementation of the Plan, Do, Check and Act (PDCA) cycle, performing hand hygiene throughout the endoscopic procedure to avoid self-contamination, patient engagement, as well as support from leaders and the inclusion of the topic during the training process of healthcare professionals.

Conclusion
Literature identified adherence and incentive strategies for hand hygiene in endoscopy. However, the lack of studies on the subject is emphasized, with most research conducted during the Covid-19 pandemic.

Keywords
Hand hygiene; Endoscopy; Health Personnel; Patient Care; Review.

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Introduction

Hand Hygiene (HH) consists of a set of simple techniques that aim to reduce the microbial load on the hands. It can be performed by simple hygiene, with water and liquid soap and/or aqueous solution of alcoholic base (ASAB), antiseptic hygiene with friction and surgical antisepsis. Due to its relevance in the health area, this practice was included in the Patient Safety protocols and recommended by the World Health Organization (WHO) in five essential moments: before touching the patient, before clean/aseptic procedures, after exposure to body fluids, after touching the patient and after touching surfaces near the patient.[1]

HH represented a great advance for the health area, since its precursor, Ignaz Philipp Semmelweis, observed that, when performed frequently, this measure considerably decreased the cases of infection.[1-2] Considered a low-cost preventive measure, rapid and efficient in the control of healthcare-related infections (HCRI), its application in all levels of health care stands out.[2]

Among the sectors covered by the different complexities of health care in which HH should be applied, there stands out the Endoscopy.[3] It is the place intended for the performance of endoscopic procedures for diagnosis and interventions, using rigid or flexible equipment and whose way of access to the body includes cavities such as oral, nasal, external ear canal, anus, vagina and urethra. It includes the presence of equipment, materials and products related to health that are used in invasive procedures that penetrate the skin, mucous membranes, sterile spaces or cavities, subepitelial tissues and vascular system.[3]

A review study on the subject reveals that adherence to HH in endoscopy by health professionals is still below expected. Although professionals report a 95% adherence, this rate reaches just over 10%. In this case, the associated factors highlighted in the literature include the complexity of routine, lack of awareness and the perception that this preventive measure is not a priority. Strategies to encourage hand hygiene in this sector, through continuing education, awareness campaigns, regular monitoring and feedback, are key tools in clinical practice. However, the topic is addressed in a limited way in the literature, with studies predominantly unicentric with reduced samples, lacking a synthesis of evidence. This limitation prevents a comprehensive evaluation of the adherence and incentive strategies, which justifies this review.

The objective of this study is to identify, through literature, adherence and strategies for encouraging hand hygiene in endoscopy.

Methods

This is an integrative literature review, guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). Although PRISMA is intended for systematic review and meta-analysis studies, its contribution to this research to increase the rigor of scientific writing becomes important.

There were six methodological steps in this review: establishment of the starting question; search for samples in the literature; categorization of the found material; evaluation of the studies included during the review; interpretation of the results found; synthesis of the acquired information.[6]

As a strategy to formulate the starting question, the PICo strategy was used, establishing the research problem to substantiate the best evidence. This method was stratified in: (P) study population = health professionals; (I) phenomenon of interest = adherence and strategies to encourage hand hygiene; (Co) context = studies performed in endoscopy. The use of this tool to establish the research problem sought the foundation in the best evidence. This said, the following guiding question emerged: how does the literature describe adherence and strategies to encourage hand hygiene among professionals in endoscopy?

The strategy to search for samples in the literature was carried out between January and March 2024 in the databases of the National Library of Medicine (PubMed), Latin American and Caribbean Health Sciences Literature (LILACS), Nursing Databases (BDENF), *Index Medicus do Pacífico Ocidental* (WPRO), *Portal de Periódicos da Coordenação de Aperfeiçoamento de Pessoal de Nível Superior* (CAPES) and the digital library Scientific Electronic Library Online (SciELO). For the scientific information research strategy, MeSH descriptors and free terms were used with the help of the Boolean operators AND and OR. The material found was then categorized (Table 1).

Table 1: Search strategy in the literature, Juiz de Fora, Minas Gerais, Brazil, 2024.

Database	Descriptors and free terms
PubMed	[Hand disinfection] OR [Hand hygiene] AND [Health personnel] AND [Endoscopie] OR [Endoscopy] OR [Endoscopies]
Scopus	[Hand disinfection] OR [Hand hygiene] OR [Infection control] AND [Health personnel] AND [Endoscopy]
Web of Science	[Hand disinfection] OR [Hand hygiene] OR [Healthcare workers] AND [Endoscopy]
LILACS	[Higienização das mãos] OR [Desinfecção das mãos] OR [Controle de infecção] OR [Prevenção de infecção] AND [Profissionais de saúde] AND [Endoscopia]
BDENF	[Higienização das mãos] OR [Desinfecção das mãos] OR [Controle de infecção] OR [Prevenção de infecção] AND [**Profissionais** de saúde] AND [Endoscopia]
WPRO	[Hand disinfection] OR [Hand hygiene] OR [Healthcare workers] AND [Endoscopy]
Portal de Periódicos da CAPES	[Desinfecção das mãos] OR [Higienização das mãos] AND [Profissionais de Saúde] AND [Endoscopia]
SciELO	[Desinfecção das mãos] OR [Higienização das mãos] AND [Endoscopia]

The inclusion criteria established to select the articles were: full texts available free of charge and/or subject to payment, without time restriction, and published in English, Portuguese or Spanish. Publications from journals that did not undergo peer review, editorials, books, letters to the editor, reflection studies and/or that did not directly address the starting question were excluded, and duplicate articles. Initially, the title and abstract were read and, in cases of inclusion, a full reading of the article was carried out, as well as all the bibliographical references included in this study.

To maintain methodological rigor during the search strategy, two reviewers selected the articles independently. Subsequently, the information was reviewed together and thus the process was completed. In the interpretation of the results obtained and in the synthesis of the information acquired, a chart was elaborated to systematize the knowledge, with the definition of the following variables: author, article title, journal, country of study, methodology, level of evidence and main highlights.

The data were analyzed through simple descriptive statistics and categorized in a visual map for the synthesis of results.

Results

Figure 1 shows the identification of studies through the databases and records, according to PRISMA. The eight databases selected for this research returned 204 studies. After the evaluation of publications and the removal of duplicate articles and/or that did not address the theme, the final sample was composed by six articles.

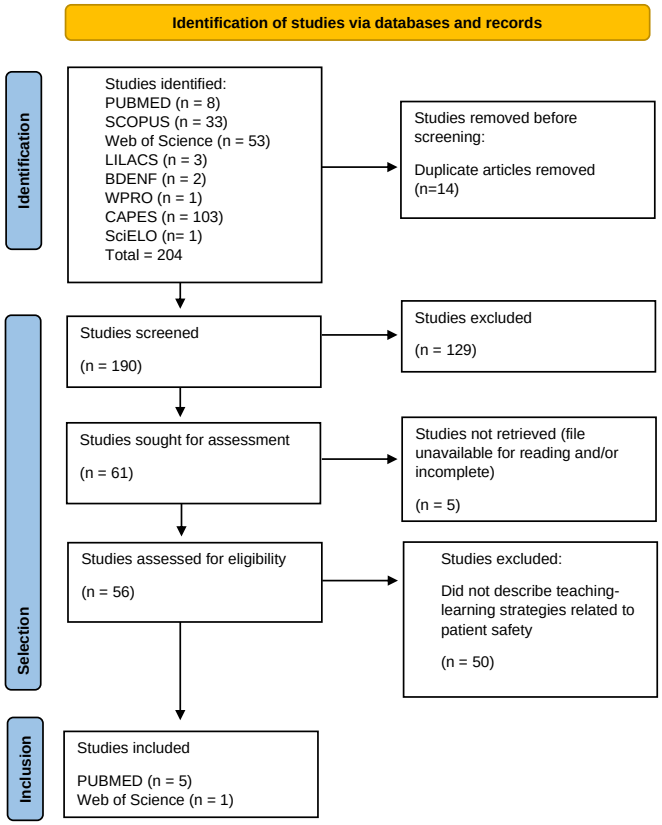

Figure 1: PRISMA Flowchart of the integrative review.[5]

Table 2 presents the synthesis of the articles selected for review. In terms of temporal delimitation, most articles were published in 2021 (50%), mainly during the period of the Covid-19 pandemic. Six scientific journals were identified, with the United States (33.3%) and Brazil (33.3%) being the main countries of origin of the research. As for the methodology used by the researchers, different designs were identified, with emphasis on descriptive studies. Only two studies addressed adherence to hand hygiene in the endoscopy sector,[13-14] while all presented strategies to encourage this preventive measure.[9-12]

Table 2: Summary of articles selected for review, 2024.

Author (year)	Title	Journal	Country of study	Methodology	Main highlights
Karels et al. (2022)[9]	Impact of Infection Control Education on Gastrointestinal Endoscopy Procedural Staff	Gastroent. Nursing	United States	Quasi-experimental study.	Educational interventions were provided to endoscopy healthcare professionals on the five moments recommended by WHO, which improved the results of the questionnaire implemented for evaluation.
Kong et al. (2021)[10]	The application of plan, do, check, act (PDCA) quality	Int J Clin Pract	China	Pre and post-intervention study	The implementation of the PDCA cycle was a strategy that improved the medical team's knowledge about

	management in reducing nosocomial infections in endoscopy rooms: It does work				HCRI and hand hygiene, when compared to the control group.
Murcio-Pérez et al. (2021)[11]	Adherence to recommendations for endoscopy practice during Covid-19 pandemic in Latin America: how are we doing it?	BMJ Open Gastroenterol	Latin American Countries	Prospective study	Encouraging hand hygiene among patients, aiming at empowerment, was one of the strategies used to prevent HCRI, recommended by the medical team during the Covid-19 pandemic in Latin America.
Pombo et al. (2021)[12]	Endoscopy infection control strategy during the Covid-19 pandemic: experience from a tertiary cancer center in Brazil	Clinics (São Paulo)	Brazil	Retrospective study	Hand hygiene was encouraged, especially: before entering the procedure room, after completion of the endoscopy and outside the room, aiming to avoid self-contamination.
Pedersen et al. (2017)[13]	Barriers, perceptions, and adherence: Hand hygiene in the operating room and endoscopy suite	Am J Infect Control	United States	Descriptive, cross-sectional study	The adherence of health professionals was 11%. One reported incentive strategy refers to the support of leaders, including direction and inclusion of the topic throughout the training process, during graduation.
Santos et al. (2013)[14]	Improving hand hygiene adherence in an endoscopy unit	Endoscopy	Brazil	Descriptive, cross-sectional study	Adherence improved from 21.4% to 73.5% after the implementation of an educational intervention, which was highlighted as a teaching strategy for hand hygiene.

Note: WHO = World Health Organization; PDCA = *Plan, Do, Check, Action*

Figure 2 shows the strategies to encourage hand hygiene, namely: educational interventions,[1] implementation of the PDCA cycle,1 HH performed in five moments to avoid self-contamination[12], patient empowerment[11], the support of leaders and the inclusion of the theme during the training process of health professionals[13].

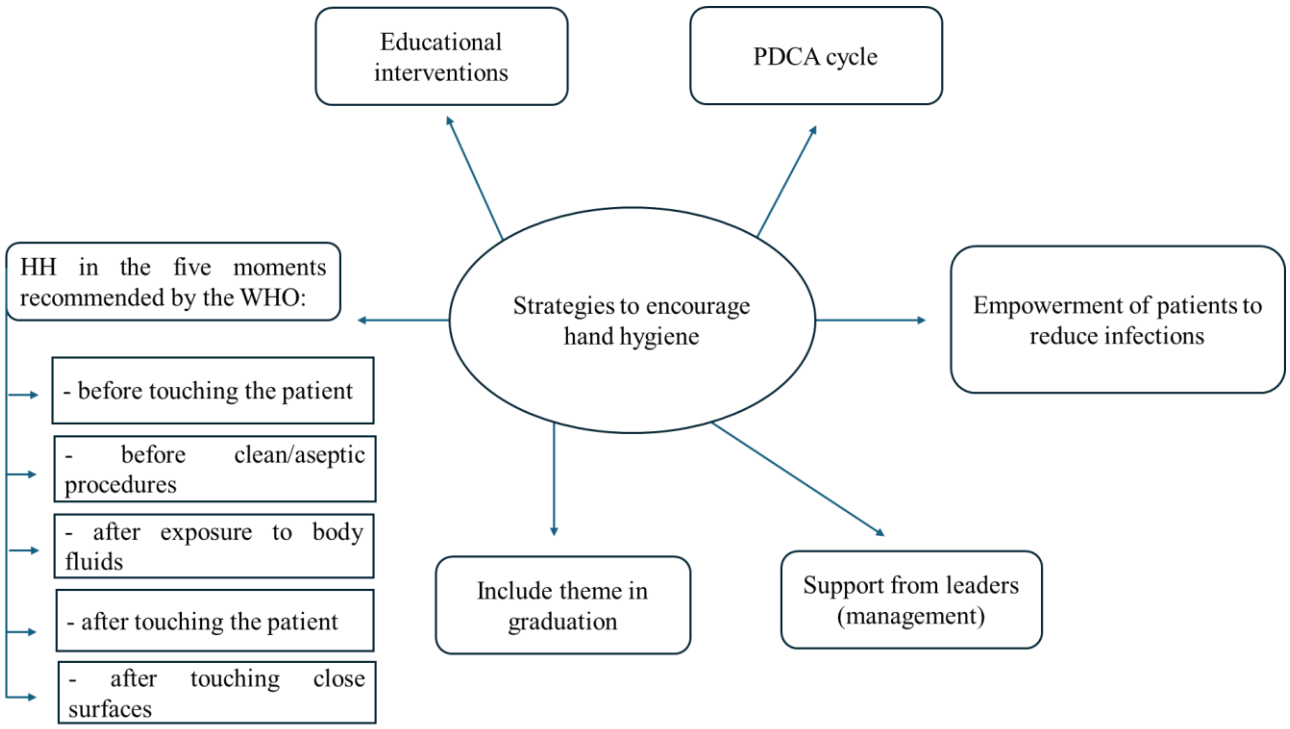

Figure 2: Strategies to encourage hand hygiene in the endoscopy sector, 2024.

Discussion

This study showed that adherence to HH in the endoscopy sector needs improvement. Although the literature lacks studies with high levels of evidence, it is worth highlighting that incentive strategies focused on health education, implementation of continuous improvement cycles, such as the PDCA, the implementation of this preventive measure at the times recommended by the WHO, the support of the management and the inclusion of the theme in the training process of professionals can contribute to improve adherence, both among the team and among patients.

The results of this study show the importance of strengthening adherence to the five hand hygiene moments recommended by the WHO, essential to prevent infections and reduce cross-transmission in sectors such as endoscopy. Although the literature highlights the relevance of this practice, data point to variable rates of adherence and often inadequate techniques, indicating a gap between international guidelines and practical reality.[1]

The importance of hand hygiene in endoscopy is widely recognized, considering its potential for contamination. Health professionals working in this sector should carry out this preventive measure appropriately, following the correct technique proposed by the WHO. This is underlined by data from a study conducted in two endoscopy centers in South Korea. In this research, surfaces such as computer keyboards and mouse were analyzed, finding the presence of non-pathogenic microorganisms, such as *Staphylococcus* spp. These microorganisms have the potential to trigger cross-contamination between people, patients and/or environments, highlighting hands as a mode of direct contact transmission.[1] In this place, HH is recommended at three times to avoid self-contamination: before entering the procedure room, after completion of endoscopy and outside the room.[12] However, although this study has highlighted three moments, it is essential to follow the five moments for hand hygiene recommended by the WHO. Adherence to these five moments not only decreases infection rates, but also promotes a culture of safety and quality in care, reinforcing the commitment to evidence-based practices that protect patients' health and the integrity of professionals, minimizing cross-transmission risks and promoting safer working environments.[1]

This research identified a varied adherence to hand hygiene in two publications, with rates ranging from 11% to 73.5%.[13,14] This picture is not limited to endoscopy, as other hospital sectors also face low adherence. An observational study conducted in a coronary unit of a university hospital highlighted a rate of 38.2%, with nursing technicians and doctors presenting the lowest results.[1] Another study revealed concerning data for patient safety, indicating that 80% of the health professionals observed performed the technique incorrectly.[1] In this context, it is necessary to implement measures to encourage HH as an integral part of the awareness strategies in the team's routine, especially multimodal interventions, and establish accountability metrics.[17,18]

There is a great challenge in maintaining high HH rates among health professionals. Nevertheless, studies included in this integrative review, conducted by this population and that addressed health education, observed an increase in adherence after interventions, both with the team and with

patients.[9,11,14] A study on the application of educational activities demonstrated that the use of strategies with a more playful approach can facilitate the understanding and retention of knowledge, contents and relevant factors on a given theme, as is the case of the triggers of HCRI and the ways to avoid them. This incentive strategy brings benefits to both professionals and patients.[19]

Another strategy to encourage HH refers to the use of the PDCA cycle as a tool with wide applicability.[10] This method consists of a continuous improvement cyclic process, organized in four stages: P (Plan), moment when the problem is defined and action methods are planned; D (Do), when the implementation of the planned methods occurs through training/teaching to employees; C (Check), aiming to verify the results of actions; and A (Action), to act in correcting unwanted effects or points that can be improved. This method is effective and applicable in several areas of knowledge, including endoscopy, contributing to the expansion of hand hygiene coverage.[20]

An aspect to be considered is the inclusion and discussion of hand hygiene as an incentive strategy to prevent HCRI throughout the training process of health professionals, especially during graduation. A survey using the Delphi technique with health professionals specialized in the area of prevention and control of infections discussed the teaching of this topic in graduate courses in the health area. There was consensus that teaching this practice at this stage has a great impact on the training of future professionals who understand the importance of measures to prevent and control infectious diseases in the workplace.[21]

In this context, the need for practice fields to be equipped with appropriate materials, appropriate physical structure, personnel sizing and efficient programs for the improvement of health professionals is discussed. This allows the continuity of what is learned in the classroom and what is practiced in real scenarios, representing one of the main challenges in consolidating knowledge. There are often many discrepancies between what is taught during graduation and practice. The HH theme should be addressed in a transversal way in higher education institutions, encouraging initiatives that stimulate critical-reflective and creative thinking, as well as methodologies that sensitize students about the subject.[22]

An important contribution of this study is that the analysis of publications revealed important insights for clinical practice. There was a significant gap in the approach to hand hygiene adherence, with only two studies exploring this issue. However, incentive strategies were identified to promote its practice. These findings not only emphasize the need for a broader approach to ensure patient safety, but also provide opportunities for the implementation of effective interventions in the endoscopy sector.

Conclusion

This study identified the adherence and strategies to encourage hand hygiene in endoscopy. However, the results highlight the need to increase adherence in this sector, since the rates may be low in the absence of interventions on the team. It is worth mentioning the strategies of incentive to this preventive measure, especially educational interventions, the use of the PDCA tool, the technique performed by health professionals throughout the endoscopy procedure, the support of the leaders and the inclusion of the theme in the training process of these professionals.

The literature on the subject was scarce, as evidenced by the final sample included in the review. Half of the studies included in this research were conducted during the Covid-19 pandemic. New studies should be encouraged in endoscopy, especially multicenter, so that it is possible to better understand the reality of the sector in relation to the subject.

Study limitations

The limitations of the study are strongly associated with the methodological choices adopted in the integrative review, which may have affected the validity and generalization of the results. First, the selection of studies revealed a possible publication bias, since many of the included articles were carried out during the Covid-19 pandemic. This exceptional context may have changed hand hygiene practices, as more rigorous protocols were in place at that time. Moreover, the scarcity of studies conducted after the pandemic limits the ability to assess adherence and strategies for encouraging hand hygiene in more recent scenarios when working conditions and practices may have changed.

Another relevant methodological limitation is related to the inclusion criterion of studies, since, as it is an integrative review, it was necessary to consider the heterogeneity of the methodologies used in the included studies. This may have compromised the comparability and depth of analysis, as different methodological approaches and research contexts influence the consistency of results. In addition, the scarcity of studies with higher level of evidence, such as randomized clinical trials, made it difficult to make robust findings and apply broader conclusions. This limitation is particularly important, since the lack of rigorous studies compromises the strength of the evidence and the possibility of generalizing the results to a wider population.

Authorship

Siviero LG: Conception and design of the study; Data collection; Data analysis and interpretation; Writing the manuscript; Critical revision of the manuscript; Approval of the final version of the manuscript and taking responsibility for it;

Braz PR: Critical revision of the manuscript; Approval of the final version of the manuscript and taking responsibility for it;

Prado RT: Critical revision of the manuscript; Approval of the final version of the manuscript and taking responsibility for it;

Carbogim FC: Critical revision of the manuscript; Approval of the final version of the manuscript and taking responsibility for it;

Nascimento TC: Critical revision of the manuscript; Approval of the final version of the manuscript and taking responsibility for it;
Rodrigues FC: Critical revision of the manuscript; Approval of the final version of the manuscript and taking responsibility for it;
Alvim ALS: Conception and design of the study; Data analysis and interpretation; Writing the manuscript; Approval of the final version of the manuscript and taking responsibility for it.

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