Measures for adherence to hand hygiene by health professionals in tertiary centers: an integrative review

Medidas para adesão à higiene das mãos por profissionais de saúde em centros terciários: revisão integrativa

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ABSTRACT: Objective: to identify and summarize scientific evidence in the literature on measures for adherence to HH by health professionals in tertiary centers. Methods: this is an integrative review built in six stages, carried out in Medline, LILACS, BDENF, SciElo and SCOPUS databases. The descriptors were “Health Personnel” and “Hand Hygiene”, aiming at an expanded search, separated by the Boolean operator AND. For the extraction, a synoptic table was built. Results: the search resulted in 1276 articles and the final sample in 16 scientific productions, of which 13 (81.2%) were quasi-experimental studies and three (18.8%) were randomized clinical trials. A positive result was identified in the hand hygiene adherence rate in 14 (87.5%) surveys. Conclusion: the implementation of measures results in an immediate response in increasing adherence to hand hygiene in tertiary centers and the strategies identified in this review can serve as an example for institutions.

KEYWORDS: Health Personnel; Hand Hygiene; Health Strategies; Review; Hospitals.


DESCRITORES: Pessoal de Saúde; Higiene das mãos; Estratégias de saúde; Revisão; Hospitais.

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INTRODUCTION

Hand hygiene (HM) is the most effective technique to prevent the spread of microorganisms and infectious diseases in healthcare institutions. Healthcare-Associated Infections (HAIs) are among the main complications linked to care, mainly affecting patients treated in hospital environments. They are responsible for high rates of morbidity and mortality and treatment costs, bringing harm to the patient, their family, the hospital institution and society.

In the United States (US), almost 1.7 million hospitalized patients annually acquire HAIs while being treated for other health problems and more than 98,000 patients (one in 17) die from it. Although significant progress has been made in preventing HAIs, it is estimated that one in every 31 hospitalized patients ends up acquiring at least one HAI. These numbers remained during 2020 and 2021, during the pandemic.

It is known that the majority of HAIs are transmitted through direct contact, mainly through the hands of healthcare professionals (HCWs), a fact associated with low HH adherence. However, some barriers can reduce adherence, such as the protection produced by products and/or hygiene techniques, inaccessibility to supplies, priority in patient care before antisepsis, use of gloves instead of hand hygiene, forgetfulness, lack of knowledge of recommendations, lack of time, high care burden or lack of information regarding the impact of HM on HAI control.

Given the importance that HM has in health services, it is understood that measures must be instituted for adherence by the PS. In this sense, the World Health Organization has been carrying out actions and joining efforts since 2005, in an attempt to increase the engagement of health institutions to implement strategies that encourage adherence to HH and recommend the implementation of a multimodal strategy, consisting of adequacy of physical structure of the institution and adequate inputs for HH, regular training and education of teams, periodic evaluation of HH with feedback to the PS, among other activities.

Interventions that encourage behavioral changes produce positive results in adherence to HH in PS. It is clear that in addition to individual changes, there is a need for organizational changes to increase compliance with this indicator. It is known that behavior change is a complex and multifaceted aspect, where education, motivation and system change are key factors. It is also necessary to address the individual’s own barriers and modify pre-existing behaviors in relation to HM.

In a university hospital in Sweden, researchers evaluated the opinion of SPs after implementing the Multimodal Hand Hygiene Improvement Strategy. The professionals reported that the changes facilitated the modification of HH adherence behavior and asked for periodic feedback to be maintained in the areas.

In 2020, the coronavirus pandemic triggered a global public health crisis across the world. Transmission of the virus occurs through direct contact, air or airborne aerosols, inhalation of respiratory droplets from infected patients or through the hands of HCWs. In this scenario, HH assumed importance as a strategy for reducing disease transmission, inside and outside hospital institutions. A study carried out by the Mexican Social Security Institute during the peak of the pandemic demonstrated that out of 117 opportunities, HH was carried out in only 40 (34%) and that 76 (65%) were omitted.

In view of the above, this study is justified by the importance of producing knowledge and discussing the topic, minimizing the risk of hospital infections and maintaining patient safety. It is understood to be an innovative study as it also sought publications on measures adopted during the pandemic period. In this context, strategies mentioned in this article can serve as an example for hospital institutions that need to improve adherence. The objective is to identify and summarize scientific evidence on measures for adherence to HH by tertiary PS centers.

METHODS

This is an integrative literature review (IR), organized according to the following steps: elaboration of the research question, literature search, data extraction, critical evaluation, analysis and synthesis of studies and synthesis of knowledge.

The guiding question was constructed with support from the PICO strategy, where “P” corresponds to the population (health professionals); “I” for intervention (any measures used in tertiary centers); “C” for comparison (not applicable, as this is not a comparative study) and “O” corresponding to the outcome (adherence to hand hygiene). Thus, the guiding question was defined as: “What evidence is available in the scientific literature on measures for adherence to HH by health professionals in tertiary centers?”

The search for studies took place in November 2022 in the databases that make up the Virtual Health Library (VHL), SCOPUS (Elsevier), the Scientific Electronic Library Online (SciELO) and Medline via PUBMED. In the VHL, the databases that contained articles were Medline, LILACS and BDENF. The choice of databases considered the scope and affinity with the topic. The data search in Medline via VHL versus PUBMED presented divergent results. For this reason, we decided to analyze the results of both search engines.

Aiming for a broad search in the literature, the search strategies combined the controlled descriptors “Health Personnel” and “Hand Hygiene”, which were selected through research in Medical Subject Headings (MeSH) and Descriptors in Health Sciences (DECS), combined using the Boolean operator AND. The terms were searched in the title and summary of publications.
Original articles from primary studies, quantitative research, in English/Spanish/Portuguese, published between October 2017 and October 2022, that tested measures for adherence to HH with soap and water or 70% alcohol gel were included. Publications presented in the form of thesis, dissertation, editorials, review articles, manuals, protocols, book chapters, reflections, opinions or comments from experts were excluded, as well as duplicate publications in the databases, which did not refer to the topic or research population or who did not answer the research question.

To assess the level of evidence, the model suggested by Melnyk and Fineout-Overholt11 was used, which classifies studies into seven levels. Considering the inclusion criteria established in this IR, the selected studies were classified as level 2 (evidence originating from at least one well-designed randomized controlled clinical trial) or level 4 (evidence originating from cohort, case-control or quasi-well-designed experiments). According to this classification, levels 1 and 2 are considered strong evidence, 3 and 4 moderate and 5 to 7 weak.

Two independent reviewers selected the studies, subsequently checking for inconsistencies and reaching consensus between the parties. The publications were exported to Excel® software and organized and summarized in a flowchart constructed with support from the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) protocol and in a form constructed by the authors12. Data are presented through descriptive analysis.

Ethical aspects were respected, with reliable citation of the authors’ sources and definitions.

RESULTS

1276 publications were identified, 556 in the VHL (494 in Medline, 37 in LILACS and 25 in BDEnf), 434 in Medline via Pubmed, 283 in SCOPUS and 3 in the SCIELO electronic library. Figure 1 shows the stages of study selection.

![Flowchart of selection of primary studies, according to the PRISMA recommendation. Teresina – PI, Brazil, 2022](source: Research Database, 2023)
After applying the inclusion and exclusion criteria, 1175 articles corresponding to 284 duplicate publications and 891 articles were eliminated in the relevance selection by title and abstract for the following reasons: it is not an article; not be research; do not belong to the theme and do not answer the guiding question. Subsequently, 101 productions were analyzed in full, with 85 articles excluded for not answering the research question during evaluation by the reviewers.

The final sample was made up of 15 publications from Medline and one from Scopus, of which 15 were published in English and one in Portuguese, with 10 journals from the USA, two from India and Brazil and Spain, Australia and the United Kingdom made up the rest. with one from each country. Regarding the design, 13 were quasi-experimental studies (level of evidence 4 and three were randomized clinical trials (level of evidence 2). Chart 1 presents a summary of the articles’ characteristics.

![Chart 1 – Characterization of primary studies according to database, journal, country of the journal, year of publication, type of study, objective and location studied. Teresina, Piauí, 2022.](chart1.png)
Regarding the location where the research was carried out, it is observed that seven were carried out in Europe, three in Asia, two in Africa, two in North America, one in the Middle East and one in South America. Chart 2 presents the measurements instituted for adherence to hand hygiene and results obtained after implementation.

**Chart 2 – Caracterização das medidas instituídas para adesão à higiene das mãos nos estudos primários. Teresina, Piauí, 2022.**

<table>
<thead>
<tr>
<th>N</th>
<th>Primary study</th>
<th>Intervention</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Maania et al.</td>
<td>Program based on the WHO multimodal hand hygiene strategy</td>
<td>Increase from 52.6% to 74.1% after three months of intervention and 70.0% at follow-up after one year (p &lt;0.001)</td>
</tr>
<tr>
<td>2</td>
<td>Casas et al.</td>
<td>Application of the 5 pillars of the WHO, a video and training with practical workshops, as well as incentives for the service/unit with better adherence</td>
<td>The MH rate increased from 60% to 75% (p&lt;0.001)</td>
</tr>
<tr>
<td>3</td>
<td>Stangerup et al.</td>
<td>Biweekly team meetings with presentations and discussion of data as well as use of an electronic monitoring system</td>
<td>There was monitoring at 3 moments: phase 1 (intervention), phase 2 (pre-pandemic monitoring) and phase 3 (monitoring during COVID-19) with rates of 58%, 46% and 34%, respectively.</td>
</tr>
<tr>
<td>4</td>
<td>Phan et al.</td>
<td>WHO multimodal hand hygiene promotion strategy program with all recommended tools</td>
<td>Adherence improved from 21.5% to 75.1%.</td>
</tr>
<tr>
<td>5</td>
<td>Aghdassi et al.</td>
<td>Quarterly meetings with presentation of HH data and establishment of goals, distribution of training materials and distribution of 70% alcohol dispensers</td>
<td>Adherence did not change significantly in either group (intervention group: 59% vs. 61%, control group: 59% vs. 60%).</td>
</tr>
</tbody>
</table>
It was found that 14 studies brought measures that showed positive results in the rate of hand hygiene adherence. Research highlights the importance of maintaining the intervention or carrying out periodic interventions.

**DISCUSSION**

HH is still one of the most effective measures in preventing healthcare-associated infections (HAIs), the spread of multi-resistant pathogens and reducing contagion by Sars Cov 2, the virus responsible for COVID-19, which remains stable in surface of the skin, favoring transmission. It can be carried out with soap and water, using 70% alcohol gel or with specific antiseptics for antisepsis. However, there is still difficulty in adherence on the part of PSs due to a series of factors, especially in the period before aseptic procedures\(^3\,29\).
This study demonstrates a panorama of fragility in health services in relation to infection control measures, since the main activity, which generates safety for the population during care, is not being carried out adequately throughout the world.

Although the WHO campaign “Clean hands are safe hands” dates back almost two decades, it appears in this IR that some institutions are still trying to implement the targeted strategies. Five studies evaluated adherence using the WHO Multimodal Strategy as an intervention, with only one not showing a positive result. In this sense, research carried out in several countries reinforced the need to reduce inequality in the prevention of infections and adherence to HH.

The WHO multimodal strategy is made up of actions to adapt the institution’s structure with the provision of equipment and supplies, regular training and education of teams, periodic assessment of HH with feedback to professionals, use of reminders for professionals and information for patients and visitors, and creating a climate of institutional safety in which subjects from all sectors act to promote HH. It also considers that the ideal would be a 100% HH rate and recommends that HH should be performed at five times: before touching the patient, before performing an aseptic task, after risk of exposure to body fluids, after touching the patient and after contact with the patient’s environment.

Professionals report that one of the biggest barriers to HH adherence is the time spent performing the procedure between patient care. They also understand that this procedure ends up reducing the time they would have to take a rest break between work shifts. Thus, in an attempt to reduce the duration of the HM procedure, a study proposed reducing the steps and obtained satisfactory results.

Another barrier cited is the lack of inputs. In this sense, three studies have proven that access to supplies, especially 70% alcohol gel dispensers, can increase adherence. The use of 70% alcohol gel, replacing HH with soap and water, in situations where there is no visible dirt, can facilitate the routine of health professionals, especially in ICUs. The COVID-19 pandemic strengthened the concern regarding HM, as there was a reduction in rates, due to a series of factors, in addition to the maintenance of extremely low adherence values. A study selected in this IR demonstrated a reduction in adherence at the peak of the pandemic. The authors understand that this reduction occurred because an intervention that was being applied in PS15 was interrupted. The pandemic required rapid measures to reduce transmission and HH was insufficient in many health institutions. The lack of professionals and overload are also believed to be causes for low adherence to HH, especially during the COVID-19 period.

The influence of religious and cultural issues was investigated in a study conducted in the United Arab Emirates and to improve adherence, the authors requested support from local scholars with the same belief and religion to build a modified improvement program. The use of 70% alcohol, even though it is alcohol gel for HM, is a barrier in some places where religion does not allow its consumption. An Iranian study demonstrated that 24.6% of nurses were concerned about inhalation while using the product and 22.7% reported that the possible absorption of 70% alcohol through the skin would be a problem.

Other strategies highlighted by the studies are training and continuing education processes carried out at the service locations, at the exits from the units and at the entrances to rest areas, in addition to training on online platforms for health professionals and those in administrative areas who have direct contact or indirect care for patients and family members, better signage with informative material about HH techniques and moments and periodic feedback, were actions that obtained positive results in hospitals.

In this context, research strengthens the need for knowledge about the importance of HH, not only as another routine process, but as a procedure that saves lives and prevents cross-transmission. Hospitals must also understand the importance of supervising and monitoring this process, which is another tool for adherence and encouragement to modify the behavior of health professionals in the face of HH.

It is understood that maintaining members of the Hospital Infection Control Committees more present in the care areas generates benefits in adherence to HH, monitoring the groups, supervising, educating, stimulating, holding periodic meetings for feedback, promoting awareness activities, among others. This measure aims to bring professionals closer to the indicators, seeking joint improvement measures.

CONCLUSION

This review achieved its objective by identifying and summarizing measures implemented to ensure adherence to hand hygiene among healthcare professionals, such as holding weekly, fortnightly or monthly meetings with professionals, as well as the implementation of the Multimodal Strategy Program for Promoting Hand Hygiene, hands of the World Health Organization with all the recommended tools.

Other measures to encourage hand hygiene identified in the literature were training for the healthcare team with an emphasis on the importance of hand hygiene and the promotion of continuing education, improved access to materials and spaces to carry out the process, distribution of posters in health centers encouraging hand hygiene before and after procedures with patients.
These and other measures implemented for hand hygiene contribute to knowledge, health promotion and patient safety. Infections have serious consequences, including considerable economic impact, longer hospital stays, increased resistance of microorganisms and significant numbers of deaths. The importance of investing in diversified programs, with multiple activities, that encourage the participation of health professionals is highlighted. Another important issue is the empowerment of the patient and family, requesting care with properly sanitized hands.

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