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REVIEW

Bed bathing in adult critical care patients

El baño en cama en pacientes adultos en cuidados críticos

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ABSTRACT

Introduction: bed bathing is an essential intervention to provide well-being and comfort to critically ill patients, as well as to protect them from risks and threats. Prolonged hospitalization in critical care units can have negative consequences, and bed bathing has been presented as a complementary intervention to improve the care provided by nursing staff.
Methods: an integrative literature review was carried out in the Scopus and Scielo databases for the last 5 years, using descriptors such as "baths" and "critical care". A total of 60 articles were obtained, from which 22 relevant to the topic were selected.
Results: bed bathing with chlorhexidine gluconate (CHG) has been shown to be effective in reducing bacterial colonization, healthcare-associated infections and the incidence of bloodstream infections in critically ill patients. Although positive results were observed with regular use of CHG bathing, more research is needed to define the optimal frequency and duration of treatment, as well as to evaluate possible adverse effects. The use of music to reduce pain in ventilated patients is identified.
Conclusion: bed bathing is used more frequently in critical settings with CHG. Further research with larger samples and defined methods is needed to maximize its effectiveness and establish clear guidelines for its appropriate use.

Keywords: Bathing; Critical Care; Care; Nursing.

RESUMEN

Introducción: el baño en cama es una intervención esencial para brindar bienestar y comodidad a pacientes en estado crítico, así como protegerlos de riesgos y amenazas. La prolongación de la hospitalización en unidades de cuidados críticos puede tener consecuencias negativas, y el baño en cama se ha presentado como una intervención complementaria para mejorar la atención proporcionada por el personal de enfermería.
Métodos: se realizó una revisión bibliográfica integradora en las bases de datos Scopus y Scielo de los últimos 5 años, empleando descriptores como "baths" y "critical care". Se obtuvieron 60 artículos, de los cuales se seleccionaron 22 relevantes para el tema.
Resultados: el baño en cama con gluconato de clorhexidina (CHG) ha demostrado su efectividad en reducir la colonización bacteriana, las infecciones asociadas a la atención médica y la incidencia de infecciones sanguíneas en pacientes críticos. Aunque se observaron resultados positivos en el uso regular del baño con CHG, se requiere más investigación para definir la frecuencia y duración óptimas del tratamiento, así como para evaluar posibles efectos adversos. Se identifica el uso de música para reducir el dolor en pacientes ventilados.
Conclusión: se usa con mayor frecuencia el baño en cama en entornos críticos con CHG. Se necesitan más investigaciones con muestras más grandes y métodos definidos para maximizar su efectividad y establecer pautas claras para su uso adecuado.

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Palabras clave: Baño; Cuidados Críticos; Cuidados; Enfermería.

INTRODUCTION

Intensive care units (ICUs) play a crucial role in delivering critical care to patients facing potentially life-threatening conditions, providing continuous treatment and monitoring to sustain vital bodily functions.[1] Among nursing professionals, the quality of care administered plays a pivotal role in the recovery and well-being of critically ill patients.[2] However, the limited autonomy for personal care in ICUs often leaves patients feeling helpless when it comes to meeting their basic needs.[3]

One of the interventions aimed at addressing these fundamental needs is bed bathing or in-bed hygiene of the patient. This intervention not only seeks to offer comfort and well-being but also serves as a preventive measure against infections. Bathing is recognized as a significant practice because it offers a holistic assessment of the patient and their environment, taking into account various factors such as dependency, neurological stability, mobility, skin condition, and pain experiences, among others. Furthermore, bathing also aims to safeguard the patient from risks and threats during healthcare assistance.

Critically ill patients, however, are exposed to various risks, including skin colonization and infections stemming from comorbidities, immunodeficiency, antibiotic administration, and impairments in skin integrity associated with invasive medical devices.[4,5] In order to optimize hygiene, comfort, and healthcare outcomes, profoundly ill patients frequently undergo daily in-bed bathing.

Despite the significance of patient hygiene within the field of nursing, the practice of bed bathing has been a topic of contention. Certain studies have documented adverse events linked to this intervention, including instances of intracranial hypertension and cardiac arrest.[5] This apprehension has prompted inquiries into the suitability of this procedure for critically ill patients, emphasizing the necessity for specialized nursing personnel equipped with comprehensive expertise and a solid foundation in bed bathing care to reduce morbidity and mortality rates among critically ill patients.

Extended hospital stays in ICUs and critical care units can lead to detrimental consequences, encompassing muscle weakness, pressure ulcers, and sleep disturbances, ultimately yielding an unfavorable prognosis throughout their hospitalization.[6] In this context, bath therapy emerges as a supplementary intervention capable of mitigating some of these challenges and augmenting the quality of care delivered by nursing personnel.

The primary aim of this review article is to assess and consolidate existing research, comparing the efficacy of bed bathing to conventional hygiene care in adult patients facing critical illness. Consequently, we present the following query: "What is the relative effectiveness of bed bathing in comparison to conventional hygiene care among critically ill adult patients, according to published research?" Employing a systematic review approach (adhering to the PRISMA methodology)[7], we aspire to offer a contemporary outlook on the effectiveness and advantages of bed bathing. Our objective is to inform clinical decision-making and advocate for the implementation of optimal hygiene practices for critically ill patients.

Hence, this article seeks to make a substantial contribution to the progression of knowledge within the field of critical care, carrying direct implications for enhancing the care and overall well-being of critically ill patients. Through the provision of an extensive perspective on existing evidence, we anticipate that this article will serve as a valuable resource for healthcare professionals in the process of clinical decision-making. Additionally, it is expected to inspire further research initiatives and the adoption of innovative approaches in the care of critically ill patients.

METHODS

A comprehensive literature review was conducted utilizing the Scopus and Scielo databases, utilizing the DeCS-MeSH descriptors in their English form: "baths" and "critical care". These descriptors were combined using the boolean operator "and", which showed 60 scientific articles during the search across both databases. The inclusion criteria encompassed studies directly pertinent to the central topic, addressing care and procedures related to bed bathing for patients in critical condition who were incapable of performing this task independently. Moreover, only publications in English and Spanish from the years 2018 to 2023 were considered, and that they were accessible either freely or through a subscription. Conversely, duplicate articles, those focusing on pediatric and neonatal care, those related to non-critical care, those lacking relevance to the research topic, and those inaccessible were excluded. Consequently, a total of 22 scientific articles were acquired after applying the review criteria (refer to Figure 1).

The main objective of this article is to evaluate and consolidate the published evidence comparing bed bathing with conventional hygiene care in critically ill adult patients. The review was conducted in accordance with the PRISMA methodology.[8]

RESULTS AND DISCUSSION

Figure 1 illustrates the workflow conducted in accordance with the proposed methodology.

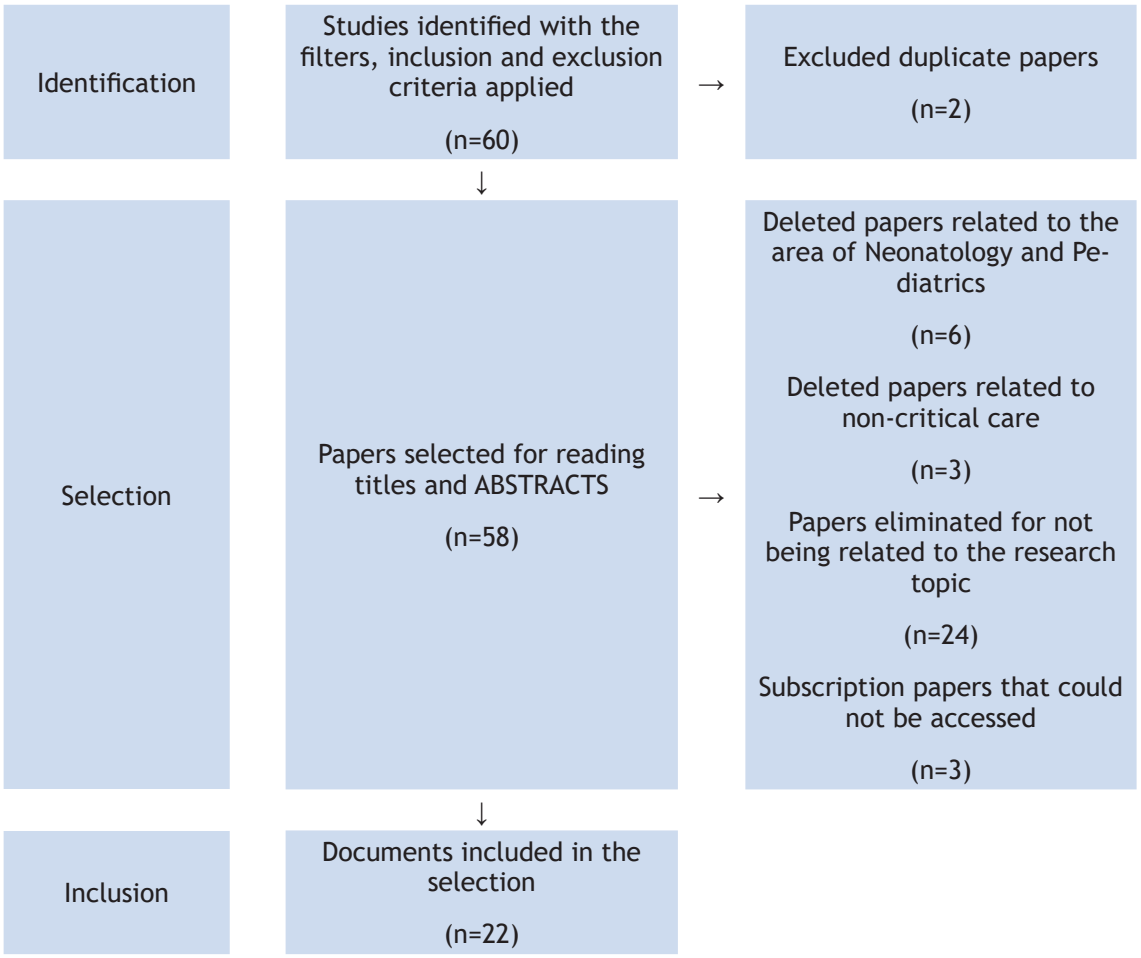

Figure. 1. Prisma Flow Diagram

In Table 1, we present the main findings from the included articles for their respective review and analysis. The table comprises information about the author, country of origin, year of publication, study type, research sample, and the main outcomes.

The current review has examined 22 studies that compare the efficacy of bed bathing with standard care for the hygiene of adult patients in critical condition.

In terms of the efficacy of Chlorhexidine Gluconate (CHG) bathing, several studies underscore its effectiveness in reducing bacterial colonization, respiratory infections, and the occurrence of bloodstream infections in critical care patients.[11,12,15,16,21,22,23] Some studies also note that achieving compliance and adherence to CHG bathing can pose challenges for certain patients and healthcare professionals.[18,24,27] Addressing this challenge is vital to ensure the intervention's effectiveness, as research indicates that CHG bathing can be as effective as, or even more effective than conventional care in preventing infections in critical patients.[3,11,16,20,21] However, Bui et al. reported no significant differences in the incidence of *Clostridium difficile* infection between the two approaches.[24]

Similarly, the concentration of Chlorhexidine Gluconate (CHG) and the bathing method's application technique are highlighted as crucial factors for achieving greater effectiveness in reducing bacterial colonization.[24,27] Concerning patient preferences and comfort, it's worth noting that CHG disposable wipe baths were favored by nursing staff due to their convenience and efficiency.[5] Nevertheless, it is acknowledged that individual patient preferences may vary, and it's essential to consider their specific needs. Consequently, there is an emphasis on the necessity for further research to obtain more robust evidence, establish the optimal bathing method, and determine the suitable frequency and duration of CHG treatment.[13,27]

Conversely, a comparative study contrasting traditional bed baths with dry bed baths, as reported by Toledo et al.[12] did not reveal significant differences in median tympanic temperatures between the two approaches. Nonetheless, a noteworthy reduction in axillary temperature was observed following the completion of the baths, with a 0,2ºC variance noted between the traditional and dry bath methods.

Table 1. Characteristics and results of the included articles

N	Author-Year	Country	Type of study	Sample	Main results
1	Medioli et al.[4]	Italy	Review	12 studies	The article discusses chlorhexidine gluconate (CHG) baths as a measure that can significantly reduce the colonization and transmission of carbapenem-resistant *Acinetobacter baumannii* (CRAB) within the hospital environment. Some studies have explored the effectiveness of CHG baths for the decolonization of CRAB-infected patients, and only seven of these studies incorporated daily CHG baths for patients. However, the 2014 guidelines from the European Society of Clinical Microbiology and Infectious Diseases (ESCMID) did not recommend universal CHG use, primarily due to a lack of compelling evidence regarding the reduction of bloodstream infections caused by gram-negative bacilli.
2	Sun et al.[9]	Republic of Korea	Quasi-Experimental Study	23 patients	The overall compliance rate for daily Chlorhexidine Gluconate (CHG) baths stood at 72,5 %. In the prospective interrupted time-series analysis (ITSA), a significant intervention effect was discerned, resulting in a substantial 58 % reduction in the acquisition of Carbapenem-Resistant Enterobacteriaceae (with a 95%CI: 7,1-82,1 %, p=0,038) after the implementation of the intervention. However, no significant effects of the intervention were observed in the trends of incidence for Carbapenem-Resistant Enterobacteriaceae, Methicillin-Resistant *Staphylococcus aureus*, and Carbapenem-Resistant *Acinetobacter baumannii* as determined through clinical cultures. Furthermore, no significant adverse effects associated with the use of CHG were observed.
3	Rongrungruang et al.[10]	Thailand	Randomized controlled trial	145 patients bathed with CHG 145 control patients	The implementation of daily CHG baths without rinsing led to a significant reduction in bacterial colonization by gram-negative and multidrug-resistant bacteria, as well as in healthcare-associated infections among hospitalized patients. The relative risk reduction (RRR) was 0,30 for overall colonization and 0,29 for multidrug-resistant gram-negative bacteria.
4	Tai et al.[5]	Taiwan	Experimental Study	138 patients bathed with disposable wipes and soap and water.	In the group utilizing disposable wipes, the average bath duration was 23,8 minutes, while the water and soap group had an average bath duration of 34,4 minutes, demonstrating a statistically significant difference (p<0,01). Moreover, baths administered with disposable wipes were shown to be more cost-effective compared to water and soap baths. There were no notable disparities in vital sign trends between the groups; however, specific result details were not provided. Nursing staff generally favored the use of disposable wipes. Nonetheless, 71,4 % of them expressed the opinion that utilizing water and soap resulted in better patient cleanliness compared to disposable wipes. It's important to note that a limitation of the study was that only one bath per patient was conducted, potentially limiting the generalizability of the results.
5	Chapman et al.[11]	United States of America	Observational Study	72 patients admitted to medical-surgical intensive care unit	The primary findings of the study indicate that the introduction of regular baths to the patients utilizing a 4 % Chlorhexidine Gluconate (CHG) solution was linked to a substantial reduction of 52 % in healthcare-associated infections within the ICU and a 45 % decrease in respiratory infections in the high-dependency unit (HDU). Moreover, it is suggested that the CHG bathing protocol outlined in the study could offer advantages for other hospitals.

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6	Toledo et al.[12]	Brazil	Clinical Trial	50 admitted patients	The study revealed no significant differences in median tympanic temperature values between traditional bed baths (p=0,707) and dry baths (p=0,101). However, a decrease in mean axillary temperature was observed following the completion of the baths (p=0,001), with a recorded temperature of 36,12°C in the traditional bath group and 35,92°C in the dry bath group.
7	Chiwaula et al.[13]	Malawi	Quasi-Experimental Study	6 nurses and 26 patients.	In the study, a paired-sample analysis was carried out using a t-test to evaluate the impact of warm sponge baths on the lowering of patients' temperatures. The results unveiled a statistically significant mean difference (t(85)=9,8427, p<0,001), signifying that warm sponge baths are deemed an effective intervention for fever reduction in ICU patients.
8	Bui et al.[14]	Canada	Secondary analysis of data from a randomized controlled trial	312 patients: 157 patients received water and soap baths, and 155 patients received CHG baths.	The study conducted a comparison between the utilization of CHG and soap-and-water baths in surgical ICU patients. The outcomes demonstrated that there were no substantial disparities in the overall utilization of antimicrobials between the two groups. These findings imply that both approaches may be equally effective in managing infections within this patient population.
9	Toledo et al.[15]	Brazil	Quasi-Experimental Study	15 patients	The study conducted a comparison between two varieties of bed baths: a dry bed bath (DBB) and a traditional bed bath (TBB). The results revealed that DBB was a faster and less exposing method for the patient. While there were no notable differences in patient oxygen saturation between both types of baths, the respiratory rate was higher during TBB in comparison to DBB. The study has limitations, including its small sample size and potential constraints in generalizing the results. Additionally, it only examined certain respiratory parameters and did not address other aspects.
10	Lewis et al.[16]	United Kingdom	Systematic review	8 studies	The primary findings extracted from the review on CHG baths for preventing hospital-acquired infections in critical care patients can be summarized as follows: The impact of CHG on reducing the incidence of hospital-acquired infections remains uncertain due to the limited certainty of available evidence. CHG baths may potentially mitigate the risk of bloodstream infections and urinary tract infections associated with catheter usage in critically ill patients. Further investigation is needed to validate the efficacy of CHG baths and to establish the optimal frequency and duration of this treatment. It is imperative to consider potential risks and constraints associated with CHG baths, such as the development of antimicrobial resistance and skin irritation. The evidence regarding whether CHG use reduces adverse events, including skin reactions, is inconclusive. The level of certainty in the evidence remains very low across all outcomes, underscoring the need for further research.
11	Pallotto et al.[17]	Italy	Randomized controlled trial	449 individuals; 226 in the treatment group and 223 in the control group	The primary findings of the study revealed that daily bathing using a 4% CHG soap-like solution, followed by a water rinse, had a pronounced effect on reducing the occurrence of hospital-acquired infections in intensive care units. In the intervention group, there was a notable 40.4% reduction in the incidence of acute respiratory infections in comparison to the control group. Additionally, the occurrence of all bloodstream infections exhibited a significant decrease within the intervention group.

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12	Mohan et al.[18]	United States of America	Observational Study	89 patients	The study illustrated that preoperative bathing with CHG enhanced compliance with the procedural measure. Additionally, there was a noteworthy decrease in surgical site infections among hospitalized vascular patients who underwent preoperative CHG bathing compared to those who did not receive this intervention.
13	Reynolds el al.[19]	United States of America	Observational Study	Two cohorts of ICU patients	The study discovered that instituting daily CHG wipe baths in the neurological Intensive Care Unit (ICU), combined with personalized and multicenter strategies, led to a substantial enhancement in the knowledge and perception of nursing staff regarding CHG bathing, as well as improved compliance with CHG bath documentation. In essence, the study underscores that the utilization of personalized and multicenter strategies can effectively bolster the implementation of evidence-based practices aimed at infection prevention in the neurological ICU.
14	Ramírez et al.[20]	Spain	Review	Articles	The document mentions the importance of a preoperative shower or bath with soap or an antiseptic product as a crucial step to reduce the bacterial load on the patient's skin and prevent nosocomial surgical site infections. It recommends the use of products containing 4% CHG in soap or iodine for cutaneous preparation. However, the document does not provide specific details regarding the outcomes of the bath itself.
15	Caya et al.[21]	United States of America	Retrospective cohort study	31 patients	The study revealed that out of the 31 interviewed patients, 74 % reported using CHG soap during their hospital stay. The average documented compliance in the electronic medical records was 78%, with a variation ranging from 57 % to 91 % across all hospital units. Approximately 16% of patients declined to use CHG for bathing, and the refusal rates varied from 3 % to 29 % across all units. The study suggests that educating patients on the proper use of CHG for bathing seems to be a fundamental factor in reducing patient resistance to its use.
16	Frost et al.[22]	Australia	Meta-analysis	5 trials	Daily bathing with CHG has demonstrated its effectiveness in reducing the risk of infection in the ICU. The findings indicate a 29 % reduction in bloodstream infections, a 40 % reduction in central line-associated bloodstream infections, and a 18 % reduction in multidrug-resistant organisms within the ICU. However, there is a lack of evidence suggesting that CHG bathing has an impact on reducing ventilator-associated pneumonia and catheter-associated urinary tract infections in the ICU. In conclusion, it is emphasized that additional clinical trials are imperative to yield more robust evidence and ascertain the precise value of CHG bathing in ICU infection prevention.
17	Jacq et al.[23]	France	Quasi-Experimental Study	30 patients with mechanical ventilation assistance	The study assessed the impact of music on mechanically ventilated patients undergoing morning bed baths. The findings indicated a significant reduction in both the intensity and duration of pain experienced by patients during the bathing process when music was introduced. The group receiving the musical intervention displayed lower pain scores and spent less time with elevated pain levels compared to the control group. These outcomes suggest that music can be a valuable tool in alleviating pain for mechanically ventilated patients during bathing. Nevertheless, further research in the form of a multicenter randomized controlled trial is necessary to validate these findings.

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18	Bui et al.[24]	United States of America	Clinical Trial	325 patients; 164 receiving daily soap and wáter baths, and 161 receiving alternate CHG baths	The primary outcome of the study indicated that there were no significant differences in the incidence of *Clostridium difficile* infection (CDI) between patients who received chlorhexidine baths every two days and those who received daily baths with soap and water. The prevalence of CDI was 3,7 % in the soap and water group and 4,3 % in the chlorhexidine group. The study concluded that there is insufficient evidence to establish a definitive link between chlorhexidine baths and the incidence of CDI in the surgical intensive care unit patients included in this study, primarily due to limitations in statistical power.
19	Thom et al.[25]	United States of America	Cohort Study	90 healthcare workers	According to the multivariate analysis presented in the study, bathing was correlated with an increased probability of pathogenic bacterial contamination of nursing uniforms. Furthermore, a second model demonstrated that the average logarithmic colony count of bacterial contamination on uniforms was higher when bathing procedures were conducted.
20	Rhee et al.[26]	United States of America	Prospective Cohort Study	63 health workers	In the study, the primary findings related to the bathing procedure indicated that cleansing with 2 % CHG impregnated cloths resulted in higher residual CHG concentrations and lower bacterial densities compared to cleansing with 4 % CHG liquid applied using either of the two different types of cloth, followed by rinsing. Both immediately and 6 hours after cleaning, method A (utilizing 2 % CHG without rinsing) generated the highest residual CHG concentrations (2500 µg/mL and 1250 µg/mL, respectively) and the lowest bacterial densities in contrast to methods B (using 4 % CHG with rinsing) or C (employing 4 % CHG with rinsing along with a cotton pad moistened with sterile water) ($P < 0,001$). However, the clinical significance of these differences has not been established yet.
21	Alserehi et al.[27]	United States of America	Observational Study	29 patients	The study revealed that approximately one-third of the patients had low CHG concentrations, regardless of the bathing method or the body area. This highlights the importance of improving the quality of bathing. It was also observed that CHG concentrations decreased 23 hours after bathing, which is expected. The authors suggest that conducting audits of CHG concentrations could help assess the quality of bathing, and that the use of CHG solution without rinsing could be an alternative to pre-impregnated cloths.
22	Costa et al.[3]	Brazil	Literature review	21 articles	The relevant findings extracted from the reviewed studies revolved around the prevention and management of upper respiratory infections, as well as the description and assessment of the bed bath procedure. While literature indicates a knowledge gap regarding the optimal technique for bed bathing, the scientific investigations analyzed in this review underscore that this procedure can induce alterations in the physiological parameters of adult patients in intensive care.

However, the dry bed bath was deemed more efficient and less invasive for the patients when compared to the traditional method and it was also favored by nursing staff due to its perceived comfort and time-saving advantages. Regarding temperature management, one study demonstrated the effectiveness of a warm sponge bath as an intervention for fever reduction in ICU patients.[11]

Additional factors, such as the bacterial contamination of nursing uniforms, were examined in a meta-analysis, which revealed that bed baths were linked to a heightened probability of contamination with pathogenic bacteria.[25]

The research conducted by Jacq et al. concluded that the inclusion of music during bed baths for mechanically ventilated patients led to a notable reduction in both the intensity and duration of pain experienced by these patients. The article posits that music could serve as a beneficial means of pain relief during bed baths. Nevertheless, additional studies are required to corroborate these findings.[23]

In terms of patients' perception and compliance with the use of Chlorhexidine Gluconate (CHG) soap during bed baths, one study revealed that some patients declined to use CHG due to a limited perception of susceptibility to infections and a lack of awareness regarding the advantages of CHG treatment. However, it was noted that patient education regarding the benefits of CHG bathing could eliminate this refusal.[21]

Certain studies acknowledge risks associated with CHG bathing, including the development of antimicrobial resistance and skin irritation. Nevertheless, the overall benefits of CHG bathing persist and outweigh these drawbacks.[10,23]

CONCLUSIONS

The analyzed studies emphasize the efficacy of Chlorhexidine Gluconate (CHG) bathing in mitigating bacterial colonization, respiratory infections, and the incidence of bloodstream infections among critical patients. These findings suggest that the incorporation of CHG in bed bathing protocols may constitute a valuable intervention for enhancing clinical outcomes within this population.

Conversely, certain studies highlight that achieving compliance and adherence to CHG bathing can present challenges for both patients and healthcare professionals. Addressing this concern is of paramount importance to guarantee the efficacy of the intervention and to foster the correct implementation of CHG bathing as an integral component of hygiene protocols in intensive care units.

Finally, despite the favorable outcomes regarding the efficacy of Chlorhexidine Gluconate (CHG) bathing, further research is imperative to acquire more robust evidence and establish precise guidelines. Conducting additional studies with larger sample sizes and providing comprehensive insights into the methods of CHG application are essential steps toward achieving heightened effectiveness in the reduction of bacterial colonization. Furthermore, there is a pressing need to define the optimal bathing protocol and ascertain the suitable frequency and duration of CHG treatment to maximize its advantages for critically ill patients.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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