

CRN55370 - Evidence Based Interventional Nursing

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Introduction

Hand hygiene is the most effective infection control measure in healthcare systems. Healthcare personnel like nurses are vulnerable to healthcare associated infections due to handling of medical equipment and infected belongings of the patients. This study will emphasise the importance of hand hygiene for nurses in their workplace. The first part will answer three questions related to hand hygiene practices that must be adopted by nurses. Second part will include a discussion about the strategies used to identify and choose the articles required to conduct this study.

The following part will measure the credibility of the chosen articles and perform a proper analysis to understand how the articles are related to the study. Fourth part will discuss the findings of the chosen articles to identify the outcomes of the previous research. The fifth part will recommend measures that nurses can adopt to maintain hand hygiene practices in their workplace for mitigating the risk of spreading infection.

Part 1: Question formulation based on the identified intervention

The hand hygiene practices are one of the major practices that ensures the contagion safety in the health care sector and facilities. According to Moran, Bailey & Doody (2021), based on the doctrine that essentialises the practice of hand hygiene, it can be concluded that the importance of frequent hand washing assures a better medical success rate. According to Park *et al.* (2020), the research aims to comply with the segmented factors that are independent, however, the hand hygiene fidelity in the healthcare facility is dependent on them.

Question 1: What are the major hand hygiene practices that determine the gold standards among physicians and nurses in the healthcare facilities?

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Population or patients	5690 nurses and 4981 doctors will be included from the different research data encapsulated in the research.
Interventions	Experimental and observational study interventions.
Comparison or control	Around 105 research journals will be contrasted in the study based on the hand hygiene practices in nursing homes and critical care facilities.
Outcome	Heterogeneity of the prevalence of hand hygiene practices among doctors and nurses can be expected.

Table 1: PICO analysis on the question 1

(Source: Author)

Question 2: How effective are multimodal intervention on hand hygiene compliance (HHC) in nursing homes?

Population or patients	15 participants nursing homes in each arm with 30 units per arm.
Interventions	HANDSOME intervention technique including the cluster randomised controlled trial as a sampling population.
Comparison or control	The pre-intervention population size will be considered to be 35% of the main population. The population count is expected to change by 50% in the post-intervention process of the research.
Outcome	Among 15 nursing home participants, 5 are expected to have distinctive infection prevention goals. Therefore ,the criticality rate is 33.33%.

Table 2: PICO analysis on the question 2

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(Source: Author)

Question 3: What are some effective hand hygiene practices that can reduce health-associated infections?

Population or patients	Around 332 research journals were selected among which around 57 were finalised by the inclusion criteria. The population size is around 567 nurses and 91 doctors.
Interventions	The comparative analysis has summarised the use of correlational intervention techniques in the research.
Comparison or control	The methodological approach of the included research will be compared for the intervention variability analysis.
Outcome	It is expected to get a 75% approximate clinical success in the HH practices among the nurses and doctors.

Table 3: PICO analysis on the question 3

(Source: Author)

Part 2: Search strategy

Searched database

Data Base		Numbers of articles found	Numbers of Articles disregarded	No of articles selected
Primary research	Longitudinal study	28	28	0
	Cross-sectional study	87	86	1

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	Cluster RCT sampling	63	61	2
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Table 4: Searched database

(Source: Author)

Inclusion and exclusion criteria

According to Craig & Dowding (2019), inclusion and exclusion criteria create the case of inclusion and exclusion conduction of the research journals that can be considered in the research. based on the specific and elaborated conditions, the researcher is able to collect the research journals that aligns with the questions and objectives of the research. Therefore, using the inclusion-exclusion criteria increases the quality and variability of the research papers extensively. According to Watson (2020), the credibility of the sources and data, interpreted in the research, also enhances with the help of inclusion-exclusion criteria.

Inclusion criteria	Exclusion criteria
<ul style="list-style-type: none"> ● Systematic reviews in the literature section were considered to be one of the major considerations for the selection of the research. ● The research included primary data and survey portal nodes were included in the selection criteria. ● Correlation studies with nursing home and critical care unit practices were selected as one of the major selection criteria. 	<ul style="list-style-type: none"> ● Researchers with less than 0.5 ‘T’ value were excluded from the research. ● Research without any search strategy over the literature section was disregarded. It is because they did not provide any value to the specified research topic. ● Research published more than 10 years before today was excluded from the research. ● The researcher has excluded any research that

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- | | |
|---|--|
| <ul style="list-style-type: none"> • Authorised publications from the PUBMED or CINAHL publication were considered for the extensive authenticity of the research methods. • Research with the population of cluster RCT samples was included in the study. • Research with statistical analysis, especially, meta-analysis processes was concluded. | <p>focuses on the therapeutic approaches and intervention over the hygiene control process in the healthcare facility.</p> <ul style="list-style-type: none"> • The researchers have excluded journals that focus on the sanitisation process only, especially for the pandemic norms. • Research data focusing on the correlational analysis of the drug -interventions and multimodal HH practices were excluded from the selection of the research in this study. |
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Table 5: Inclusion and Exclusion criteria

(Source: Author)

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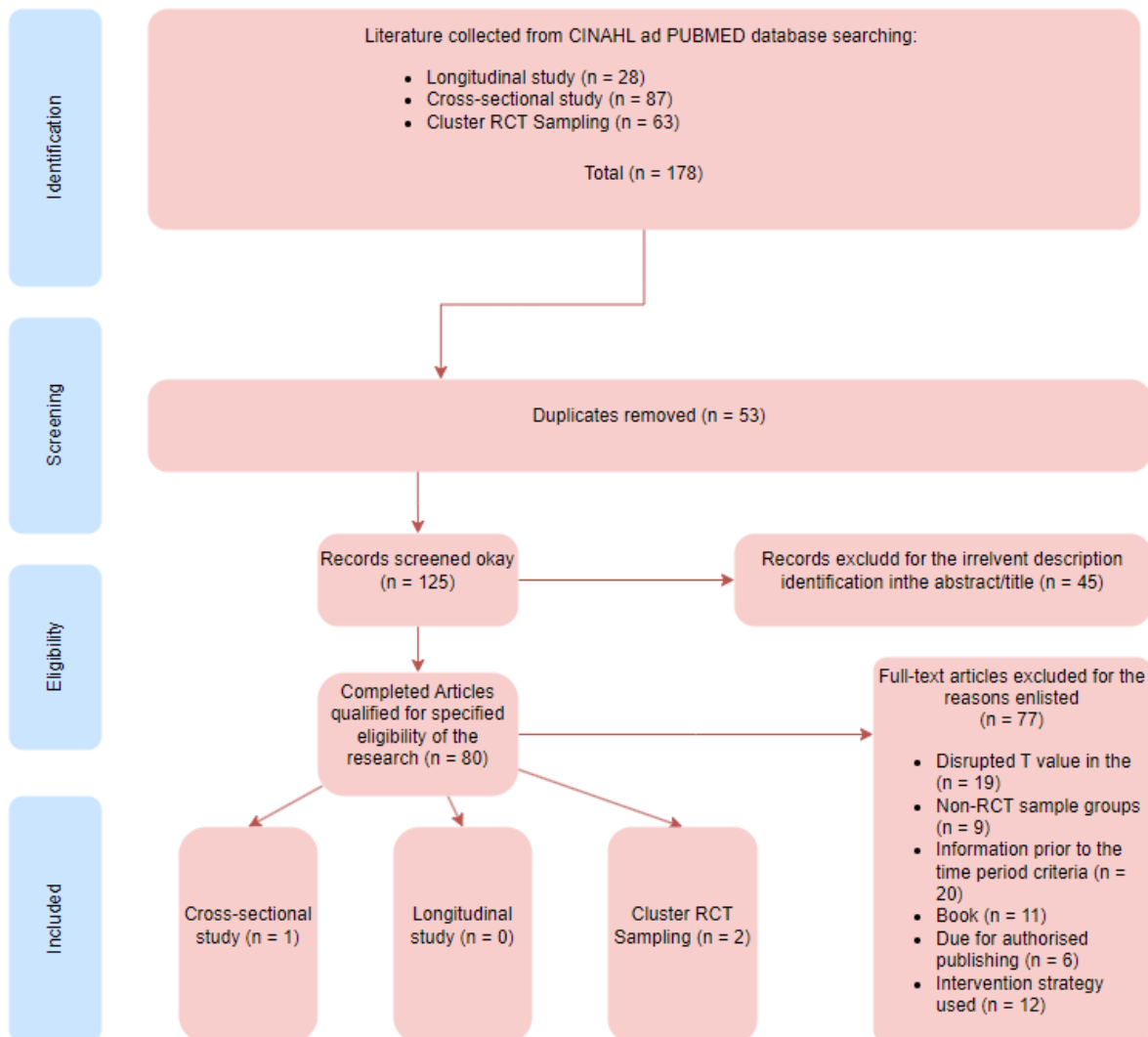


Figure 1: PRISMA Flow chart

(Source: Author)

The researcher has totally collected 178 research journal papers for the search of hand hygiene practices in the nursing home and critical care centres. Additionally, the health hygiene and hand hygiene practices of the doctors were collected from the journals for comparative study. around 125 research journals were finally selected after excluding 53 studies for having repetitive data or population. After that, the significance of the neutralisation from the 'T' value

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and alpha value of the meta-analysis process around 33 research journals were excluded. Finally, 3 research papers were selected for the discussion of the hand hygiene practices requirements. The gold standards of the hand hygiene practices were discussed and elaborated in one of the journal papers.

Part 3: Critical appraisal of the articles

Article 1: Hand hygiene compliance by direct observation in physicians and nurses: a systematic review and meta-analysis.

Checklist items	Yes/No	Comments
Did the research clearly focus on the objected question?	Yes	It talked about the HAI practices in the nursing practice and the essentiality of the hand hygiene activities.
Was there a specific and cohort way of selecting the samples of the research?	Yes	The first article used a cluster RCT sampling process where the subjective factors were implemented in the sampling process to select the participants.
Did the research gather accurate outcomes of the statistical analysis for reducing any generalised bias?	Yes	The researchers gather accurate outcomes using the meta-analysis process in the statistical analysis domain. This increased the quality and credibility of the research data sorting.
Did the research identify all the confounded objectives and factors?	Yes	Around 56% of the correlational factors were primed in the research.
Elaborative alignment with the subjective interpretation.	No	The researcher did not profoundly elaborate on each result in the document. This has reduced the credibility of the discussion and

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		opportunities for elaborative conclusion.
Sufficient elaboration was provided.	No	There was not sufficient discussion and elaboration on the research findings. This has limited the opportunities for future prospects of the research.

Table 6: CASP for Article 1

(Source: Author)

Article 2: Increased hand hygiene compliance in nursing homes after a multimodal intervention: A cluster randomised controlled trial (HANDSOME).

Checklist items	Yes/No	Comments
Did the research clearly focus on the objected question?	Yes	The researcher has segmented the objective into 2 major parts with more than 8 factors. These factors were analysed based on the quantitative and statistical study.
Was there a specific and cohort way of selecting the samples of the research?	Yes	The researcher used correlational analysis to collect the study samples around 600 samples were collected based on the longitudinal study formulation.
Did the research gather accurate outcomes of the statistical analysis for reducing any generalised bias?	Yes	The researcher used the Cronbach alpha analysis and meta-analysis process based on the linear regression process to analyse the relation between the independent and dependent variables.
Did the research identify all the	Yes	The researcher has found a 78% relation between the

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confounded objectives and factors?		dependable and independent variables in the research which increased the credibility of the study.
Elaborative alignment with the subjective interpretation.	Yes	The subjective interpretation and methodological comparison increased the variability determinant data in the research findings. This was elaborately outlined in the research.
Sufficient elaboration was provided.	No	N/A

Table 7: CASP for Article 2

(Source: Author)

Article 3: Hand hygiene-related clinical trials reported since 2010: a systematic review.

Checklist items	Yes/No	Comments
Did the research clearly focus on the objected question?	Yes	The researcher clearly focused on the subjective and objective interpretation of the study after centralising the study materials.
Was there a specific and cohort way of selecting the samples of the research?	Yes	The researcher used the cluster RCT sampling process where the segmented population based on certain characteristic parameters were selected. Therefore, the coercion of the sampling process was achieved in the article.
Did the research gather accurate outcomes of the statistical analysis for reducing any generalised bias?	Yes	The meta-analysis process allowed the researcher to collect and correlate the selected factors which were considered as responsive dependable variables in the research.
Did the research identify all the	Yes	Yes the research identified all the factors that were estimated in

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confounded objectives and factors?		the pre-intervention phase of the study. This increased a significant credibility of the research.
Elaborative alignment with the subjective interpretation.	No	The researcher did not elaborate the subjective and objective interpretation of the factors which created a gap for the correlational analysis of the research.
Sufficient elaboration was provided.	Yes	However, sufficient elaboration of the research data was provided which increased the simplification of the results in the statistical meta-analysis process.

Table 8: CASP for Article 3

(Source: Author)

Part 4: Summarising the key findings**Article 1:** (Bredin *et al.*, 2022)

The purpose of the article is to highlight the compliance associated with hand hygiene through direct observation in nurses and physicians (Bredin *et al.*, 2022). The WHO (World Health Organisation) published the guidelines on HAIs which are ensured by hand hygiene. WHO highlighted five moments of hand hygiene including before touching patients, before the aseptic procedure, after touching patients, after the exposure to body fluid, and after touching patient surroundings (Bredin *et al.*, 2022). The authors of this article have focused on direct and indirect methods for observing hand hygiene. Automated monitoring is important to highlight the potential areas of bias including section bias, observer bias, and observation bias (Hillier, 2020). It is important to spread knowledge among nurses and physicians about the maintenance of hand

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hygiene for reducing healthcare risks (Martos-Cabrera *et al.*, 2019). The article focuses on differences in compliance between nurses and physicians for determining the estimation of compliance success related to hand hygiene. Compliance with hand hygiene is defined as the proportion of observed opportunities for hand hygiene leading to handwashing with soap and water. The wide compliance variability estimates in the methodological hand hygiene quality for developing the reporting of hand hygiene studies (Ceylan *et al.*, 2020). The authors have focused on Systematic Reviews and Meta-Analysis to conduct the research.

The participants performed the actions of hand hygiene and a 95% confidence interval between physicians as well as nurses in dichotomous outcomes. The authors calculate the compliance of hand hygiene for each study with the baseline compliance estimation. It was founded that information provided by hand hygiene is used to calculate the opportunities for hand hygiene compliance (Hammerschmidt & Manser, 2019). The systematic databases search including PubMed, CINAHL, Embase, and CENTRAL was performed. The authors of this article focused on observational hospital setting studies in high-income countries. The search in systematic databases yielded 4814 studies, out of which the researcher has included 105 studies (Bredin *et al.*, 2022). The random-effects proportion meta-analysis was applied for estimating the weighted pooled compliance rate. The compliance rate with weighted pooled nurses was 52% with a 47 to 57 confidence interval (Bredin *et al.*, 2022). Alternatively, the compliance rate with weighted pooled doctors was 45% with a 40 to 49 confidence interval. The heterogeneity was considered 99% in this article and the major studies project a moderate or high bias risk (Hammerschmidt & Manser, 2019). The study suggests that there needs to be higher compliance with hand hygiene for nurses compared to physicians.

Article 2: (Teasing *et al.*, 2020)

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The authors of the article concentrated on the HANDSOME intervention demonstrating the multimodal intervention. This intervention increases hand hygiene in the nursing homes and the adherence to the guideline of HH enhanced during the intervention significantly (Teasing *et al.*, 2020). The authors focus on the enactment of the intervention during the intervention as well as 6 months after the intervention. The evaluation of HHC was deployed directly with unobtrusive observation using cluster randomised controlled trials. Around 103 nursing homes were selected by the authors for participating in the study (Cambil Martin *et al.*, 2020). Article 1 discussed the five moments of hand hygiene and Article 2 also focused on the WHO-defined 5 moments of hand hygiene. The authors mentioned the 5 moments of HH in this study to provide knowledge to the nurses to reduce healthcare-associated infections (Stadler & Tschudin-Sutter, 2020). The nursing homes are lying at a higher risk of spreading infections from microorganisms and the nursing homes attempt to maintain HHC (Hand Hygiene Compliance) in hospitals (Cambil Martin *et al.*, 2020). The intervention of HANDSOME is known as the cluster randomised trial in the nursing home units for increasing the HHC of the nurses after the intervention of multimodal.

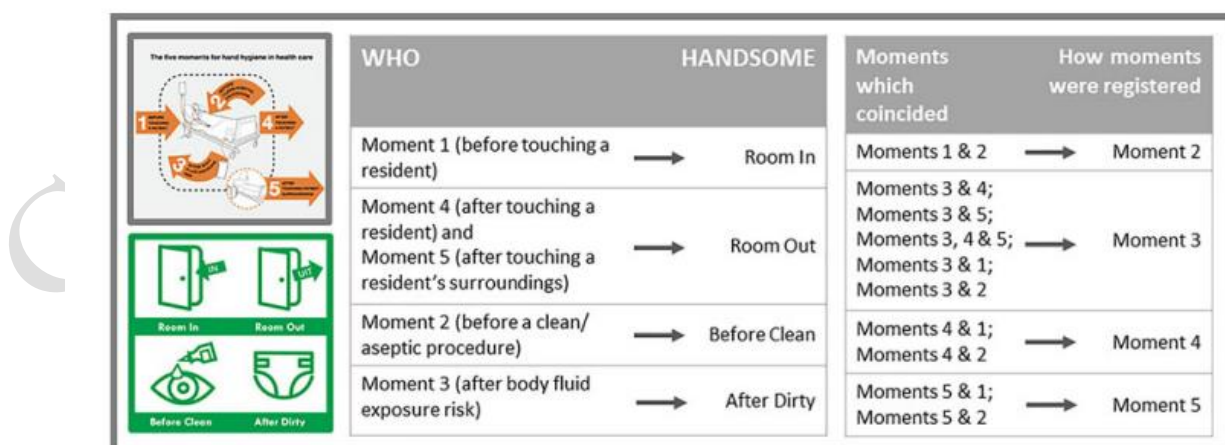


Figure 2: WHO and HANDSOME Method

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(Source: Teesing *et al.*, 2020)

The intervention of HANDSOME includes activities which change the policy of nursing homes and the individuals' behaviour (Stadler & Tschudin-Sutter, 2020). The audit with the HH materials and the regulations of personal hygiene helps the nursing homes to change their policies. The healthcare workers and nurses were subject to 3 various live on-site HH lessons, an e-learning program, and opportunities to participate in the HH photo competition (Korhonen *et al.*, 2019). Nurses attained knowledge about the 5 moments of the hand hygiene recommendations of WHO (Teesing *et al.*, 2020). The management of nursing homes and hospitals is informed they received a good hand hygiene certificate if they attain minimum HH compliance. The necessary policy changes were discussed with the management for efficient HH practices. The manager conducted the lesson and taught the 5 moments of HH and 20 minutes were allocated for lesson 1. In this lesson, the nurses get the HH certificate by completing their e-learning about hand hygiene (Korhonen *et al.*, 2019). The senior nursing manager represents the personal policy related to hand hygiene for supporting the minimum compliance of HH. During the session of lesson 2, the nurses make the inventory solutions to the barriers to HH compliance (Teesing *et al.*, 2020). The participants in lesson 3 wash their hands with paint and learn how to disinfect their hands. The E-learning session was lasting up to 40 minutes and videos were used with the correct behaviour for expressing HH moments. The common HH actions were also represented in the e-learning sessions for protecting nurses from healthcare-related infections.

Article 3: (Kingston, O'connell & Dunne, 2016)

Healthcare-related infections termed nosocomial infections lead to increments in patients' morbidity. HCAs result in healthcare cost increments for the patients, hospitals, and insurers due

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to the unanticipated hospital stay (Kingston, O'Connell & Dunne, 2016). The psychological burden placed on the carers, patients, and their families affects clinical safety. Considerable emphasis is placed on the reduction of health-related infection by developing compliance with hand hygiene among nurses and other healthcare professionals. Poor HH (Hand Hygiene) compliance created challenges for healthcare centres and nursing homes to protect patients from being affected by different infections. The purpose of this article is to report the systematic search outcomes for published studies and peer-reviewed clinical trials. The WHO guidelines for hand hygiene have been published which were indexed in CINAHL and PubMed. The methodology and relevance of the 57 publications were retrieved from 16 clinical trials (Kingston, O'Connell & Dunne, 2016).

Compliance with hand hygiene was recognised as a hand hygiene opportunity and four studies adopted the “My five moments for hand hygiene”. It leads to moderate improvement in HH compliance which provides knowledge to the nurses about the maintenance of patients’ safety. The compliance of HH was measured by electronic recording or by direct observation (Kingston, O'Connell & Dunne, 2016). The clinical trial report helps the authors to understand the significance of using the intervention of hand hygiene. Article 1 and Article 2 have also focused on the WHO guidelines for HH interventions for disinfecting hands. Hand hygiene materials were used in the clinical practices for stopping the spread of infection. It creates awareness among nurses and medical professionals to demonstrate the idea of HH intervention for reducing the health risks related to infections (Hillier, 2020).

Part 5: Implication for practices

Hand Sanitisation: According to Reinbeck & Antonacci (2019), hand sanitizers are easily accessible and convenient for nurses to maintain hand hygiene while handling healthcare

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settings. Busy schedules of nurses do not provide them sufficient time to wash their hands frequently. Hand sanitizers are proved to be more time efficient when it is compared to traditional handwashing with water and soap. According to Kopeinik *et al.* (2023), this enables the nurses to clean their hands whenever they want or need to without using a washroom or a washbasin.

Personal Protective Equipment (PPE): According to Amorim & Lopes Junior (2021), PPE is an important tool while handling healthcare systems which are prone to bacterial growth. PPE acts as a barrier to nurses as well as patients to avoid spreading of a disease or an infection. PPE such as medical gloves can be worn by nurses to practise hand hygiene while performing a healthcare task. According to Owens *et al.* (2022), this helps to avoid direct contamination through hands and reduces the risk of transmitting pathogens to nurses themselves or other patients.

Multimodal interventions: According to Abinsson, Carlsson-Blomster & Lindqvist (2021), multimodal intervention in healthcare primarily includes educating the nurses, doctors, physicians and patients about the importance of maintaining hand hygiene in nursing homes and hospitals. Implementing multimodal intervention has a high chance to increase hand hygiene by providing proper training to nurses on how to keep their hands clean. Supervisors must be appointed to demonstrate and scrutinise the hand cleaning practices of the nurses. According to Disler *et al.* (2019), these interventions encourage peer accountability through implementing measures for constant hand hygiene.

Maintaining Guidelines: According to Pollock *et al.* (2021), every nursing home or hospital must have a proper guideline about maintaining hand hygiene ethics to be protected from infections and diseases. The latest guidelines about hand hygiene stated by WHO must be

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informed to the nurses by the authority. This will not only help the nurses to mitigate the risk of spreading pathogens, but also encourage other healthcare personnels to adopt changes to maintain appropriate hand hygiene (Eastern, 2022).

Conclusion

Healthcare-associated diseases are a primary cause for illness in nurses as well as other patients. Transmitting pathogens can be stopped initially if hand hygiene practices are maintained regularly in healthcare institutions. Part 1 of the study has answered three questions related to hand hygiene practices that must be adopted by nurses by performing PICO analysis of each question. Part 2 has discussed the strategies used to identify and choose three articles that have a significant contribution in the study by differentiating them into inclusion and exclusion criteria.

The third part has measured the credibility of the chosen articles and performed a proper analysis to understand how the articles are related to the study. Part 4 has discussed the findings of the chosen articles to identify the outcomes of the previous research. Part 5 has recommended four measures that nurses can adopt to maintain hand hygiene practices in their workplace for mitigating the risk of spreading infection.

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