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Professional Research

Behavioral interventions to enhance hand hygiene compliance among healthcare workers

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II. Abstract

Keeping hands clean has been considered to be a strong barrier against the spread of dangerous bacteria and hospital illnesses. Every hospital staff member has an obligation to wash their hands.

One of the most important measures in the battle against the spread of dangerous germs and hospital infections is hand hygiene. It is also an essential infection control strategy, and any inadequate hand hygiene practice can raise the death and morbidity rates of patients therefore healthcare personnel must increase their adherence to hand hygiene measures in order to reduce healthcare-associated infections and ensure patient safety.

Aim: This study aims to Investigate and reach behavioral interventions that can improve and increase healthcare workers' compliance with hand hygiene regulations. This will help to raise health professionals' awareness of the benefits of practicing good hand hygiene, the risks associated with not doing so, and the routes through which infections spread. These actions will have a significant positive impact on patient outcomes, including lower rates of patient mortality and morbidity and protection from cross-contamination.

Approach: This will be through reviewing significant articles and research studies which reported the essential behavioral interventions that improve hand hygiene adherence and compliance among healthcare workers during the last 20 years.

Conclusion: behavioral interventions are essential for enhancing hand hygiene compliance among healthcare workers and a multimodal approach that combines education, cues, feedback, incentives, accessibility, self-monitoring, leadership involvement, and a supportive culture is most effective in addition hand hygiene habits will develop

more sustainably if these treatments are customized to the unique demands and circumstances of the healthcare environment. Subsequent studies must to go on investigating novel approaches and assessing their sustained efficacy in diverse healthcare contexts

1. Chapter one

1.1 Introduction

Maintaining proper hand hygiene is considered to be the best barrier against the spread of harmful microbes and hospital infections. It is a responsibility of every hospital employee to practice good hand hygiene.

The importance of hand hygiene is enormous because it aims to prevent infections that are directly related to patient care. The first one who proved the effect of hand hygiene in the reduction of post-operative infections was Semmelweis in 1881. **(Kriari et al., 2018; Sotnikova & Fasoi, 2013; Staphylidis et al., 2015)**

In order to lower healthcare-associated infections and guarantee patient safety, healthcare staff must improve their adherence to hand hygiene practices.

In the European Union, hospital infections are estimated to result in 37,000 deaths, with the cost of them be very high and amounting to around 5 billion euros per year. As for the US, although there are advanced Health Services, about 15 million patients each year suffer from hospital infections. These are the third cause of death after the heart diseases and cancers. Finally, in the US, 2,000,000 hospital infections result in 99,000 deaths at about $ 20 billion per year. **(HCDCP, 2019)**

The World Health Organization (WHO) in the international campaign of "SAVE LIVES: Clean your hands," puts hand hygiene as the foundation stone for the prevention and control of health-related infections, as "it is the simplest and an effective measure of prevention "of these infections. **(Astrinaki et al, 2016)**

Hand Hygiene is the most important measure to prevent the spread of pathogenic microorganisms and hospital infections, being the cornerstone

of infection control programs. **(Chun & Kim, 2018; Goldberg, 2017; Klymenko & Kampf, 2015)**

The importance of its implementation is undoubted and the ways of its proper implementation are known to all health professionals.

Researches have shown that this practice alone is able to greatly reduce hospital infections. Finally, hand hygiene, apart from being one of the strongest preventive measures, has low implementation costs and its effectiveness is well documented. **(HCDCP, 2019; Mu'taz et al., 2016; Yawson & Hesse, 2013; Kousouli et al., 2016)**

1.2. The study Problem:

Hand hygiene is one of the most crucial steps in the fight against the spread of harmful bacteria and hospital infections, and it is a vital infection control measure and any unsatisfactory practicing hand hygiene procedure can lead to increased mortality and morbidity rates of patients.

1.3. The importance of studying:

Explore and reach to behavioral interventions that can enhance and increase healthcare workers' adherence to and compliance with hand hygiene regulations is very important to improve the awareness of health professionals the importance of practicing proper hand hygiene, the adverse effects of not doing so, and the channels through which infections spread which will have a great reflection on improving patients health, decreasing the mortality and morbidity rates of the patients and protecting the patients and health workers from cross infection.

1.4. Objectives of the study:

1- Explore different effective behavioral strategies to improve healthcare personnel' adherence to hand hygiene.

2- Elaborate on awareness of healthcare workers about hand hygiene significance.

3- Assess the needs for training of health workers on hand hygiene procedures .

4- Explore different determinants among healthcare personnel regarding hand hygiene.

1.5. Study hypotheses and questions:

Study hypothesis:

Exploring and implementation of some behavioral interventions will improve hand hygiene adherence and compliance among healthcare workers.

Study Question:

Does following and implementation of some behavioral interventions improve hand hygiene adherence and compliance among healthcare workers?

1.6. Study Approach:

Reviewing important articles and research studies which reported the important behavioral interventions that enhance hand hygiene adherence and compliance among healthcare workers during the last 20 years.

Chapter Two:

Review of literature:

2.1. Hand hygiene overview:

Hand hygiene (HH) practice is regarded as a fundamental measure in the prevention and control of healthcare-associated infections and antimicrobial-resistant pathogens **(Allegranzi & Pittet, 2009; Pierce et al., 2020, cited in Al-Maani et al., 2022).**

Hand hygiene best practices involve washing hands at the appropriate moments and using the correct techniques. **(WHO, 2009, cited in Douno et al., 2023).**

Further than 100 years of evidence convincingly shows that handwashing decreases the risk of infection **(Cannon & Davis, 2005 cited in Lhakhang et al., 2015)**

Hand hygiene is the process of cleaning one's hands to prevent the spread of infectious diseases.

Nevertheless, only 31% of men and 65% of women wash their hands after using a public restroom **(Judah et al., 2009 cited in Lhakhang et al., 2015)**.

Numerous studies have stated unacceptable hand hygiene practices and difficulties in continuing healthcare workers' (HCWs) compliance levels **(Clancy et al., 2021; Gon et al., 2020, cited in Al-Maani et al., 2022)**

According to the World Health Organization (WHO), "the burden of healthcare-associated infections (HCAIs) worldwide is very high in terms of morbidity, mortality, extracosts, and other outcome indicators" (**WHO, 2011, quoted in Douno et al., 2023)**

Young adults are considerably less likely to wash their hands.(Vujcic et al., 2012 **cited in Lhakhang et al., 2015)**.

In spite of this, research on hand hygiene noncompliance in this age range is limited. (Mariwah et al., 2012 **cited in Lhakhang et al., 2015)**..

Health practitioners must understand the significance of maintaining good hand hygiene and the consequences of failing to do so. Additionally, understanding the pathogenic microorganisms' modes of transmission and the microbes that cause the diseases is important . Maintaining good hand hygiene is essential, and healthcare providers must to be knowledgeable about wide range of hand hygiene. It is important to remember that everyone in administrative roles in hospitals has an obligation to follow and adhere to the hand hygiene rules **(Alefragkis et al., 2019).**

2.2. health care-associated infections:

Infections that people get while undergoing treatment for other disorders at a medical facility are known as health care-associated infections. Health care-associated infections are infections that patients get when they are receiving medical care in a hospital or another facility. They were not present or incubating at the time of admission.

Health care–associated infections (HCAIs), formerly referred to as nosocomial infections, are infections that are acquired within any health care setting. This includes inpatient and outpatient areas, radiology departments (RD), and emergency departments (ED). (**Hefzy et al., 2015 Cited in Ilyas et al., 2019)**

Recently, there has been a notable rise in morbidity and mortality linked to health care–associated infections (HCAIs) globally, making them a top priority on the World Health Organization (WHO) agenda. HCAIs are the

fourth major cause of disease in developed countries. **(Guggenbichler et al., 2011 Cited in Ilyas et al., 2019)**

There are several Types of health care-associated infections such as:

- **Surgical Site Infections**: Infections taking place at the site of a surgical procedure.
- **Catheter-Associated Urinary Tract Infections**: Urinary tract Infections because of catheter presence.
- **Central Line-Associated Bloodstream Infections:** Infections that happen when bacteria enter the bloodstream via a central line.
- **Ventilator-Associated Events**: Infections that develop in patients who are on mechanical ventilation.
- **Clostridium difficile Infections:** Infections produced by the bacterium Clostridium difficile, causing severe diarrhea and colitis.

In a study of **Magill et al. (2014)** they concluded that that public health observation and prevention activities should continue to address C. difficile infections. As infections linked to medical devices and procedures decline, consideration should be given to increasing surveillance and prevention activities to include other health care–associated infections.

It's caused by Pathogens such as bacteria, viruses, fungi, and other microorganisms and the transmission of these Pathogens as Spread can occur through many routes such as direct contact, contaminated equipment, or surfaces

Also there are some risk Factors such as Invasive Procedures for example surgeries, catheter insertions, and mechanical ventilation, also Compromised Immune System: Patients with weakened immune systems or chronic conditions are at higher risk. In addition to prolonged hospital stays increase the probability of health care-associated infections and in the

same time overuse or inappropriate use of antibiotics can produce antibiotic-resistant bacteria.

Some procedures are strongly recommended to decrease health care-associated infections such as:

- **Hand Hygiene**: Regular and thorough hand washing by healthcare workers and patients.
- **Sterilization and Disinfection**: Proper cleaning, disinfection and sterilization of medical equipment and environments.
- Using antibiotics carefully to prevent resistance.
- **Infection Control Protocols**: Adherence to protocols for infection control, such as using personal protective equipment (PPE) and isolation measures and other infection control measures.

Health care–associated infections (HCAIs) represent a significant and overlooked threat in hospitals. To prevent these infections, it is strongly recommended to strictly follow disinfection protocols and infection prevention measures. **(Ilyas et al., 2019)**

Direct observation and feedback led to improved adherence to hand-hygiene practices among doctors and nurses, which was linked to a reduction in health care–associated infections. However, additional research is required to assess the extent to which hand hygiene contributes to lowering these infections. **(Ojanperä et al., 2020)**

Hospitals that have been involved in an infection control network for an extended period reduced rates of major health care-associated infections by about 50%, cut costs, and saved lives. **(Anderson et al., 2011)**

Health care-associated infections can cause extended hospital stays, increase medical costs, and more mortality rates. Therefor reducing health

care-associated infections is essential for improving overall patient safety and quality of care.

According to **Hefzy's et al. (2015)** study in developing countries, the risk of HCAIs is significantly higher, with a ratio of 20:1 compared to developed nations. **(Hefzy et al., 2015 Cited in Ilyas et al., 2019).**

It was once thought that health care–associated infections (HCAIs) occurred only in inpatient hospital settings, where patients initially interact with the health care system while acutely ill. However, recent outbreaks have revealed that a substantial number of HCAIs also occur in outpatient settings. **(Hefzy et al., 2015 cited in Ilyas et al., 2019).**

It is very important for Ongoing monitoring of infection rates and sources to recognize and identify outbreaks.in addition to reporting certain HAIs to public health authorities by hospitals and healthcare facilities are required for tracking and improvement.

Effective and professional infection control techniques, careful monitoring, and continual education and training for medical personnel are all necessary in the fight against healthcare-associated infections

4.1. Conclusions:

1-For the purpose of lowering healthcare-associated infections and guaranteeing patient safety, healthcare personnel must adhere to hand hygiene protocols.

2- Behavioral interventions are essential for enhancing hand hygiene compliance among healthcare workers.

3- A multimodal approach that combines education, cues, feedback, incentives, accessibility, self-monitoring, leadership involvement, and a supportive culture is most effective.

4- Hand hygiene habits will develop more sustainably and with better results if these usages are customized to the unique demands and circumstances of the healthcare environment.

5- It is very important to select the appropriate interventions for individuals and institutions with different cultures, environments and financial capabilities to ensure continued hand hygiene compliance.

6- Subsequent studies must to go on investigating novel approaches and assessing their sustained efficacy in diverse healthcare contexts.

4.2. Recommendations:

1- Implementation of multimodal approach that combines various interventions such as education, cues, feedback, incentives, accessibility, self-monitoring, leadership involvement, and a supportive culture to increase hand hygiene compliance among health workers.

2- Identifying, addressing and solving any barriers and obstacles that can negatively affect hand hygiene compliance.

3- Proper selection of suitable interventions that may have greater impact on certain individuals according to their surrounding environment, cultural background of the individuals and financial capabilities of health institutions.

4- Regular evaluation and assessment of hand hygiene compliance among health care workers to assure their continual adherence to hand hygiene and practicing it by a correct procedures.

5- In case of any negligence or non-compliance with hand hygiene among the workers, the reasons for this must be identified, any obstacles must be overcome, or used behavioral interventions strategy for this institution must be checked, reassessed, adjusted, modified or even changed if necessary.

6- Future studies and researches is recommended for examining new approaches and evaluating their continued effectiveness in different healthcare environment.

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