

# Nursing Interventions For Reducing Infection Risks In Hospitals

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## ABSTRACT

### Background

Infections from hospitals are an important risk which increases the rate of morbidity significantly. This research aims to assess the importance of nursing interventions in reducing infection risks in hospitals, especially in the National Healthcare Services (NHS) UK. The objectives of this research are,

- To explore the healthcare-associated infection (HCAI) risks in UK hospitals, especially in the NHS.
- To identify challenges faced by UK nurses in dealing with these infections.
- To assess the nursing interventions existing in the NHS and their limitations
- To recommend strategies to enhance the nursing interventions to reduce infection risks in UK hospitals, especially in the NHS.

### Methods

The exploratory research design has been used in this research where both qualitative and quantitative information has been collected through a primary survey of 20 nurses of the NHS through 8 close-ended and 2 open-ended questionnaires. The participants have been selected through purposive sampling and the key principles of the Data Protection Act 2018 have been maintained throughout this research. The participants got involved in this research after providing written consent via email.

### Results

The results of the study have shown that nursing professionals may face challenges regarding the lack of training, communication and collaboration. In this regard, developing a collaborative work environment through the implementation of effective internal communication systems and safety protocols training needs to be prioritised by healthcare organisations.

### Conclusion

This study has revealed the effectiveness of PPE, hand hygiene and multi-drug resistant infection management protocols, and frequent training of nursing professionals as the key interventions for reducing infection spread risks.

**Keywords:** Healthcare-associated infection (HCAI), hand hygiene, cleaning, cough and respiratory hygiene, sanitation, safe management of linen, soft furnishings, blood and body fluids

### Acknowledgements:

### Conflicts of Interest:

## 1. Introduction

### 1.1 Background of the research

The infection risks in the UK hospitals are significant as these harm patients and costs the NHS by spreading rapidly. Some of the commonly known hospital infections are “Clostridium difficile (C. difficile)” and “Staphylococcus aureus (MRSA)” which cause significant morbidity to those who are infected (1). As per the recent information around 300,000 people in the UK acquire “healthcare-associated infection (HCAI)” as a result of the National Healthcare Services (NHS) care (2). Therefore, the nursing intervention is important to reduce these infection risks in the UK hospitals. These interventions include maintaining hand hygiene, cleaning, cough and respiratory hygiene, sanitation, and safe management of linen, soft furnishings, blood and body fluids (3). Overall, using a personal protective equipment (PPE) kit has been considered as an important nursing intervention to prevent HCAI.

### 1.2 The objectives of this research

- To explore the healthcare-associated infection (HCAI) risks in UK hospitals, especially in the NHS.
- To identify challenges faced by UK nurses in dealing with these infections.
- To assess the nursing interventions existing in the NHS and their limitations
- To recommend strategies to enhance the nursing interventions to reduce infection risks in UK hospitals, especially in the NHS.

### 1.3 Research structure

This research will include a detailed methodology including study design, participants, sampling, data collection from past studies and the existing primary data sources. This will further discuss the data analysis and ethical considerations of this research. After that, the results of this research will be assessed based on demographic and statistical characteristics followed by the discussion process by comparing the results with existing literature. It will further recommend the strategies for improvement with a conclusive end.

## 2. Methodology

### 2.1 Study Design

The nursing intervention in the NHS has been explored on how these are effective in reducing the risk of infections through healthcare services. The exploratory research design helps assess less investigated research topics to understand whether the existing information on that topic is true or vague (4). The exploratory research design has been implemented in this research to assess the types and importance of nursing interventions to reduce risks of HCAI and enhance health and well-being in the UK. As the basic concept of the healthcare services from public hospitals is founded on complete recovery from diseases, however, the issues regarding infection risks due to poor sanitation practices are less explored. Therefore, the exploratory research design is appropriate for this research.

### 2.2 Participants and Sampling

**Purposive sampling** has been used in this research to get information on nursing interventions for reducing infection risks in UK hospitals, especially in the NHS from 20 nurses of this organisation. In purposive sampling, the participants of a survey or interview are selected based on their knowledge of the importance of nursing intervention for reducing HCAI. This sampling has helped acquire appropriate information on these factors which is important to improve the quality of this research.

### 2.3 Data Collection

#### 2.3.1 Literature Review

The existing data on nursing interventions to reduce risks of infections in UK hospitals have been collected from databases like Google Scholar. The information from the last 5 years has been included in this research and all types of master's and doctoral dissertations have been excluded in this research. Books on this research topic have been collected from 2014 which helped improve the depth of this research. The keywords which are used to search these research papers included "healthcare-associated infection (HCAI)", "hand hygiene", "cleaning", "cough and respiratory hygiene", "sanitation", "safe management of linen, soft furnishings", "safe management of blood and body fluids".

#### 2.3.2 Semi-structured survey:

The semi-structured survey executed in this research includes 8 close-ended questions along with 2 open-ended questions. Here 2 demographic questions have helped identify the eligibility of the research participants to deliver appropriate information. Both qualitative and quantitative information have been collected through this semi-structured survey.

1. *What is your age group?*
2. *What is your recent professional role in the hospital?*
3. *How often do you adhere to hand hygiene protocols before and after patient contact?*
4. *How effective do you believe personal protective equipment (PPE) is in reducing infection risks?*
5. *Do you receive regular training on updated infection control guidelines?*
6. *How strictly are infection prevention protocols enforced in your department?*
7. *Do you find the current protocols for managing multi-drug-resistant infections effective?*
8. *How confident are you in identifying and isolating patients with infectious diseases?*
9. *What challenges do you face in implementing infection control measures in your daily nursing practice?*
10. *What additional support or resources do you believe are necessary to enhance infection prevention in your hospital?*

#### 2.3.3 Data Analysis

Data analysis in research refers to a process which includes cleaning, assessing and reporting the results of the data collected in research which helps meet research objectives appropriately (5). In this research, the graphical and statistical data analysis methods have been used to identify the data patterns (Themes) and meet research objectives appropriately.

#### 2.3.4 Ethical Considerations

The UK Data Protection Act 2018 includes principles such as lawfulness, transparency, fairness, integrity, confidentiality, accuracy and accountability (6). The information of the research participants has been used with proper confidentiality, integrity and accountability. The consent from the participants has been taken through email and all their personal information has been collected by declaring the purpose and objectives of this research clearly. All their information has been stored in cloud computing with limited access to avoid data breach and that information has been used in this research anonymously.

### 3. Results

#### 3.1 Demographic Characteristics

Demographic characteristics of survey respondents help to know about the target audience of the research. In this research, the age group and nursing position of the 20 participants have been identified. This helped the researcher to have a better insight into nursing professionals of different ages working in diverse roles within the organisation.

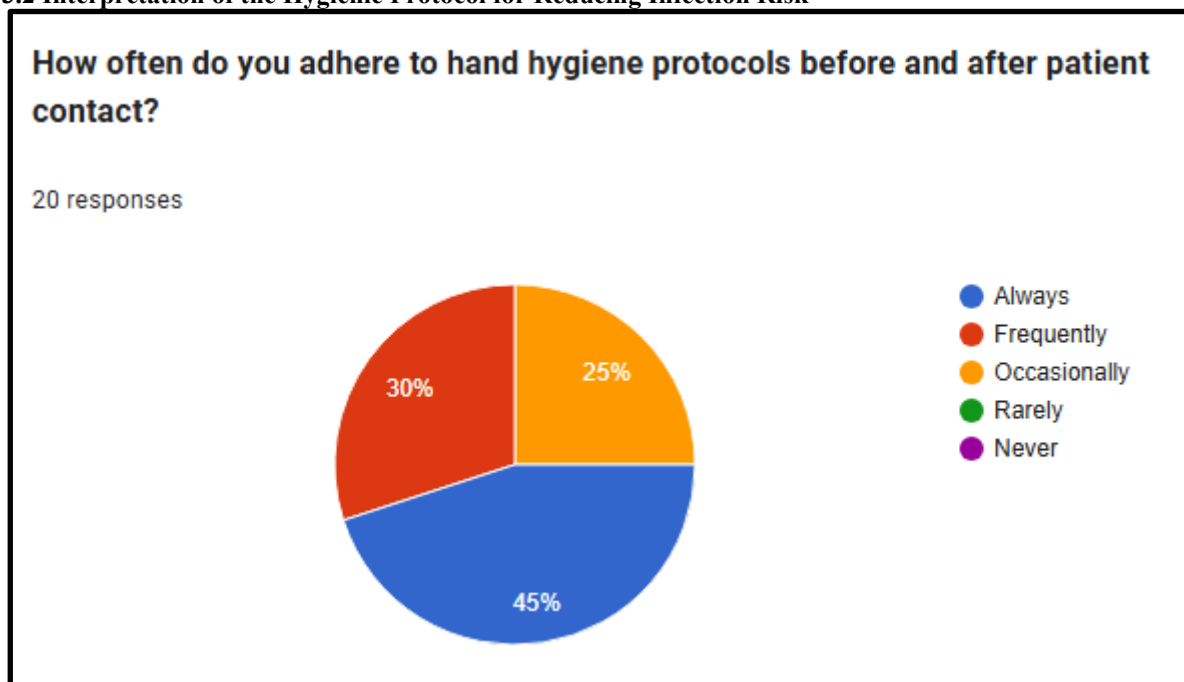
Demographic characteristics	Percentage
Age group	20-30 Years: 35% 31-40 Years: 30% 41-50 Years: 25% Above 51 Years: 10%
Current role in nursing	Nursing Assistant: 40% Senior Nurse: 40% Nursing Supervisor: 10% Manager: 10%

**Table 1: Demographic Characteristics**

(Source: Self-Developed)

The above table shows the demographic characteristics of the survey participants. It has been understood that almost 35% of professionals were 20-30 years of age whereas, the number of respondents aged between 31 to 40 years was 30%. Moreover, 25% of participants were aged between 41 to 50 years. Only 10% of respondents have been seen as aged over 50 years. On the other hand, the number of respondents working in nursing assistant and senior assistant roles was 40% each. Apart from this, the professionals working in both nursing supervisor and manager roles were at 10%.

#### 3.2 Interpretation of the Hygienic Protocol for Reducing Infection Risk

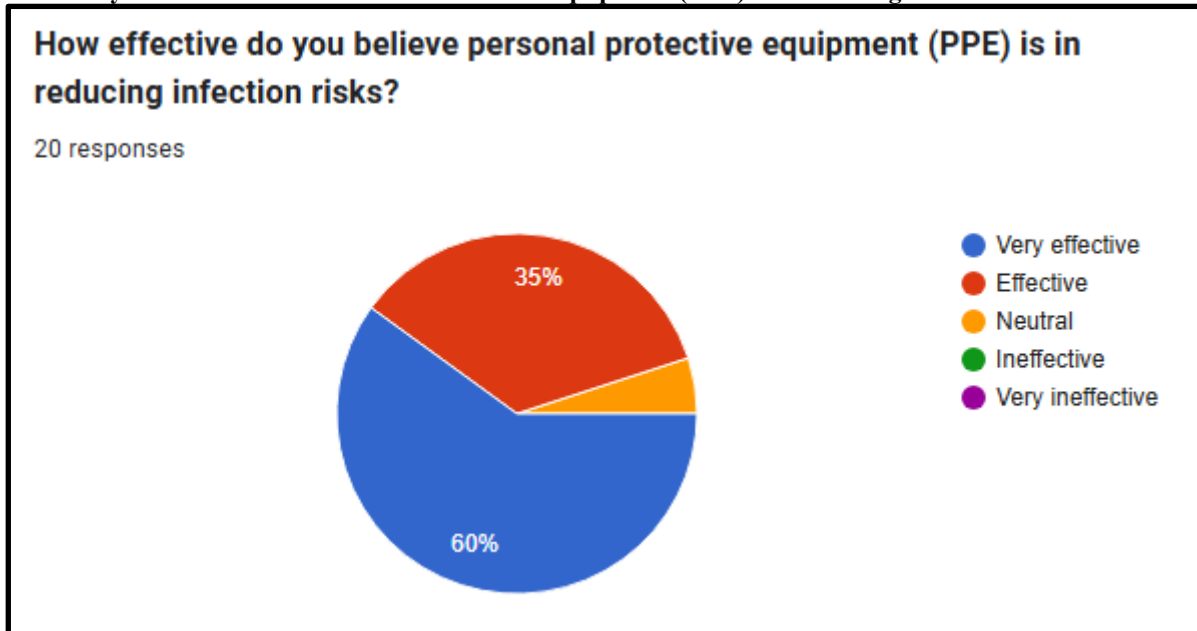


**Figure 1: Survey responses on hand hygiene protocols before and after patient contact**

(Source: Self-Developed)

The above figure shows that 45% of nursing professionals always maintain hand hygiene protocols before and after patient contact. Whereas, 30% mentioned that they frequently maintain the protocols and 25% of respondents mentioned their occasional engagement in maintaining hand hygiene protocols. Thus, it can be mentioned that hand hygiene protocols are required to reduce infection spread among patients.

### 3.3 Analysis of the Role of Personal Protective Equipment (PPE) for Reducing Infection Risk

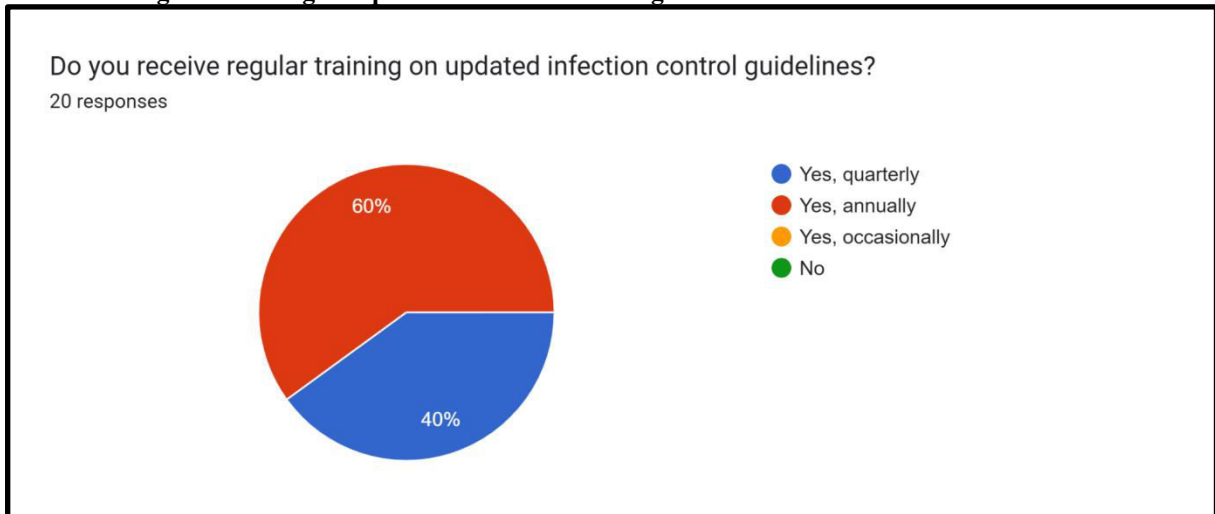


**Figure 2: Survey responses on personal protective equipment (PPE) in reducing infection risks**

(Source: Self-Developed)

The above figure shows that 60% of survey respondents acknowledged that personal protective equipment (PPE) kits are very effective in reducing infection risks. Moreover, 35% of respondents claimed the kit was effective in reducing infection risks. No participants mentioned the ineffectiveness of PPE kits in infection reduction which shows that the equipment is highly required for infection risk mitigation.

### 3.4 Role of regular training on updated infection control guidelines

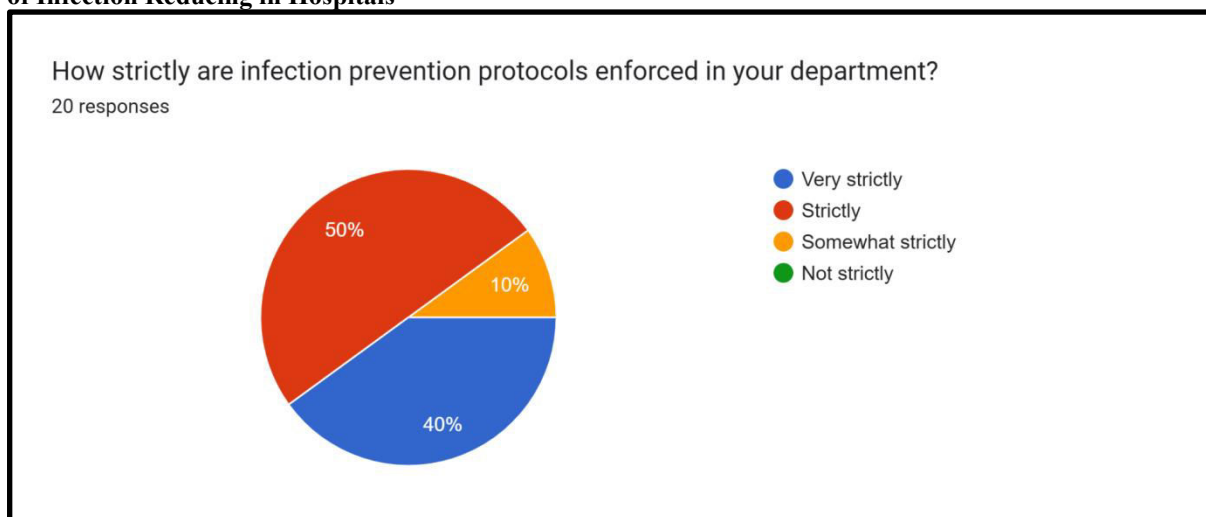


**Figure 3: Survey responses on updated infection control guidelines**

(Source: Self-Developed)

In the context of updated infection control guidelines, the above figure shows that 60% of participants get annual training on infection control measures and approaches. On the other hand, 40% of participants got training on a quarterly basis. This shows training of staff nurses regarding infection prevention is a necessary intervention to mitigate the risks.

### 3.5 Analysis of the Implication of the Infection Prevention protocol and current protocols in the Context of Infection Reducing in Hospitals

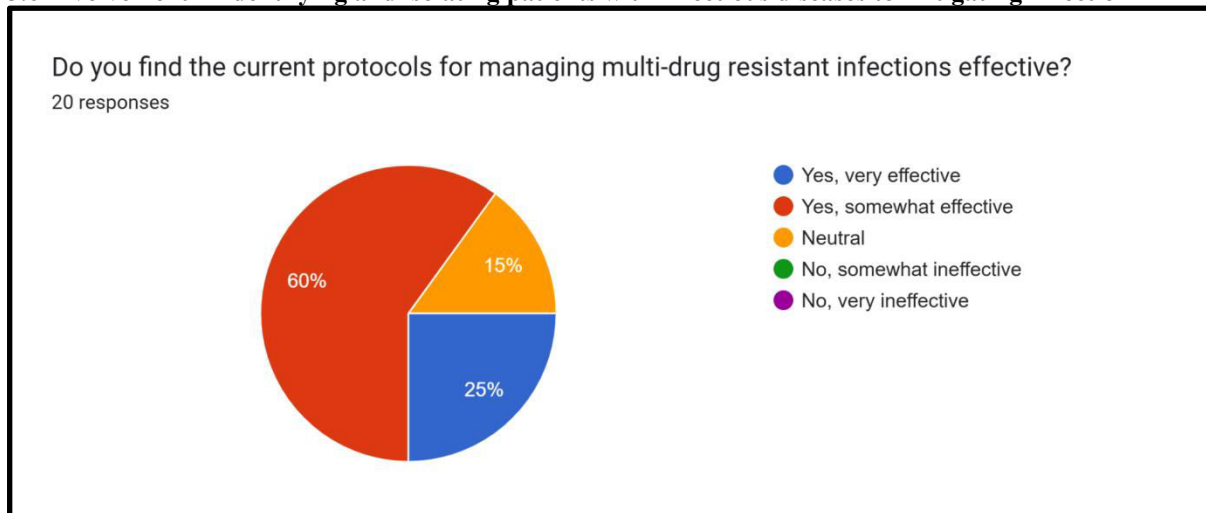


**Figure 4: Survey responses on infection prevention protocols**

(Source: Self-Developed)

The above figure shows that 50% of survey respondents have claimed that infection prevention is strict within their department. Whereas, 40% of respondents mentioned even stricter protocols within their organisation. In this regard, it can be stated that stricter regulations and protocols bring effectiveness to infection prevention within hospitals.

### 3.6 Involvement in identifying and isolating patients with infectious diseases to Mitigating Infection



**Figure 5: Survey responses on the effectiveness of protocols for managing multi-drug-resistant infections**

(Source: Self-Developed)

The above figure highlights that 25% of respondents have mentioned that protocols for managing multi-drug-resistant infections are highly effective within their organisation. Whereas, 60% have stated the effectiveness of the same. This shows protocols for managing multi-drug-resistant infections are also necessary for hospitals to reduce the risks of infection spread.

### 3.7 Challenges do you face in implementing infection control measures in your daily nursing practice

In the context of challenges faced during the implementation of infection control measures, survey respondents have highlighted a range of challenges. One respondent stated, *“Isolation protocols can make patients feel lonely, and I feel bad enforcing measures that limit visits from loved ones”*. On a similar note, another respondent mentioned *“Patient isolation is one of the high-cost services that create challenges in implementing infection control measures”*. This shows patient isolation is one of the key challenges related to the implementation of infection control measures. In addition to this, other respondents have mentioned *“Ineffectiveness in communication and collaboration between professionals can be blamed for ineffectiveness in infection prevention”* and *“Inadequacy of training and development creates an ineffectiveness in infection controlling”*. This shows that the other challenges of incorporating effective infection control and prevention measures are affected in a negative manner by ineffectiveness in communication and collaboration between

nursing professionals within hospitals as well as lack of adequate training and development regarding infection control protocols.

### 3.8 Requirement of additional support or resources for Reducing Infection

In the context of support and resources to reduce infection in hospitals communication and collaboration between nursing professionals should be prioritised. In this regard, one respondent has mentioned “*Clearer updates on infection control policies and why certain measures are in place would help everyone stay on the same page*”. In this same context, another respondent said “*Developing effective communication systems could mitigate the existing challenges of infection prevention.*”. Thus, enhancing internal communication systems and developing a smoother flow of information can enhance the knowledge of nursing professionals and other carers regarding infection prevention protocols and approaches. On the other hand, one respondent claimed “*Developing a collaborative work environment is the key aspect of developing infection prevention at hospitals*”. This shows the development of a positive work environment is a necessary aspect for nursing healthcare professionals to ensure a better level of safety for patients from infection spread. Apart from this, another respondent mentioned: “*Adequate funding from government healthcare authorities may enhance the infection prevention controls*”. This shows the involvement of national authorities and agencies in enhancing healthcare budgets is also required by nursing professionals.

### 3.9 Statistical Analysis

Regression Statistics	
Multiple R	0.439941
R Square	0.193548
Adjusted R Square	0.148746
Standard Error	0.527046
Observations	20

**Table 2: Regression Statistics**

(Source: Self-Developed)

The above table shows that the R Square value of the presented data is 0.193548 whereas the standard error value has been estimated at 0.527046. This shows the data is moderately scattered due to the sample size. However, the regression analysis values show somewhat relevance of the key findings.

## 4. Discussion

### 4.1 Key Findings and Implications

The graphical and statistical data analysis has shown that hand hygiene is an important area of focus in the NHS which has helped reduce the risk of infections significantly. Apart from these, it has also been found that the implication of PPE kits is significantly reducing infections as this is very effective in stopping the spread of germs over any kind of verbal and physical interaction. This has also been found that the quarterly training of nurses on the updated control guidelines helps reduce the risk of infections. The confident isolation of patients with infectious diseases can also reduce the risks of infections and can reduce the possibilities of any type of pandemic such as COVID-19.

However, from the qualitative responses, it has been found that the strict isolation protocols of patients, ineffective collaboration among nursing professionals, low supply of essentials, ineffective communication and inadequate training are creating challenges in a long shift to reduce risks of infections and develop a healthy environment within a hospital. In order to overcome these issues, the nurses mentioned that the use of UV cleaning machines, sanitiser dispensers, adequate funding from the government healthcare authorities, hands-on infection control training and overall, fostering effective communications can help improve the quality of nursing intervention to reduce infection risks.

## 4.2 Comparison with Literature

The nursing interventions significantly reduce the spread of infectious germs which helps improve the quality of healthcare services in the UK. Washing hands frequently and wearing gloves are two of the most important nursing interventions that help reduce infections (7). From the primary survey, it has also been found that the nurses of the NHS are significantly focused on hand hygiene protocols which help them improve healthcare services. It has also been found that they think the use of PPE kits is very effective in reducing risks of infections. From the existing studies, it has also been found that wearing gloves, masks, gowns and eyewear helps reduce exposure to infectious materials which include used syringes, ampoules and other used medical kits (8). It has also been found that confident isolation is an important factor which helps reduce infection risks within a hospital (9). The primary response also supports this finding from the literature.

From the primary responses, it has been identified that inadequate funding for the advancement of technologies for sanitisation is significantly affecting nursing interventions to reduce infection risks. From the literature, it has been found that the lack of resources is a significant challenge to improving the effectiveness of nursing interventions to reduce infection risks and this is also affecting infection control training (10). In order to overcome these issues proper communication among different departments within a hospital is important (11). Overall, it can be stated that there is a vast area of improvement in the NHS to improve nursing interventions and reduce risks of infections.

## 4.3 Strategies for Improvement

Proper investments to increase the quality of PPT for disinfection can help reduce infection risk within a healthcare organisation. Recent information shows that the UK government wasted hundreds of millions of pounds of taxpayers' money on poor quality and unusable personal protective equipment (PPE) (12). Therefore, better money management and investment can be an effective strategy to improve the quality of PPE kits to reduce the risk of infections. Overall, continuous training of nurses can also help improve the nursing intervention in the NHS to reduce infection risks.

## 5. Conclusion

This study has shown that effective approaches or interventions for infection prevention in hospitals require a huge amount of involvement from nursing professionals. In this regard, it has been found that hand hygiene protocols, PPE kits, protocols for managing multi-drug-resistant infections and timely updated protocol training are the effective approaches to enhance the safety of individual patients from infection spread within hospitals. However, challenges like lack of communication and collaboration as well as inadequate training of nursing professionals, need to be mitigated by developing internal communication systems and a collaborative work environment.

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