Assessing the Awareness Level of Dental Assistants in Al-Qassim regarding Infection Control Methods and Policies

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Abstract

The study titled aimed to evaluate the knowledge, training, and practices of dental assistants concerning infection control standards in healthcare. Utilizing a structured questionnaire distributed via Google Forms, data were collected from 48 participants and analyzed using SPSS software. The results indicated varied levels of familiarity with infection control guidelines, with 54.2% of respondents expressing confidence in applying infection control measures. Training was a pivotal factor, as 47.9% reported occasional training and 37.5% received regular sessions, highlighting its role in fostering safer healthcare environments. Challenges in adhering to infection control

practices were prevalent, with frequent and occasional difficulties reported by 56.3% of participants. Areas requiring further improvement included sterilization procedures (31.3%) and environmental cleaning (25%). The study emphasized the importance of continuous education, workplace support, and updates on infection control protocols to enhance compliance and awareness. Recommendations included implementing more frequent and comprehensive training sessions, introducing modern technological solutions, and promoting regular reviews of infection control policies.

Keywords: Infection Control, Dental Assistants, Awareness, Training, Healthcare Standards, Compliance.

Introduction

Infection control is a cornerstone of safe healthcare delivery, particularly in dental settings where the risk of cross-contamination is significantly high. Dental clinics are unique environments where the interaction between patients, dental professionals, and medical instruments creates multiple opportunities for the transmission of infectious agents, such as bacteria, viruses, and other pathogens. Procedures involving saliva, blood, and aerosols further amplify these risks, necessitating strict adherence to infection control methods and policies to protect both patients and healthcare providers (Upendran, 2023).

Dental assistants are essential members of the dental team and play a pivotal role in maintaining infection control standards. Their responsibilities encompass a range of critical activities, including sterilizing dental instruments, ensuring the cleanliness of treatment areas, adhering to hand hygiene practices, and assisting dentists during procedures while following universal precautions. As they are directly involved in patient care and clinic management, their level of awareness and adherence to infection control protocols directly impacts the overall safety and effectiveness of dental care services (Albishe, 2022).

Globally, infection control standards and guidelines are well-documented by organizations such as the World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC). However, the practical application of these standards often varies depending on the level of training, resources, and awareness among healthcare workers. In the context of Saudi Arabia, and particularly in the Al-Qassim region, there is limited research on the awareness levels of dental assistants regarding infection control practices. This gap is concerning given their crucial role in preventing the spread of infections within dental clinics (Broussard & Kahwaji., 2023).

Understanding the current awareness levels and identifying gaps in knowledge or practice among dental assistants is critical for improving infection control measures in dental clinics. Enhancing awareness not only supports compliance with infection control policies but also fosters a culture of safety, reduces healthcare-associated infections, and builds trust with patients (Ghimire, 2018).

This study aims to comprehensively assess the awareness levels of dental assistants in Al-Qassim regarding infection control methods and policies. By identifying strengths and areas for improvement, the findings of this study will serve as a foundation for designing targeted training programs, improving infection control protocols, and ultimately raising the standard of dental care in the region. Additionally, the study will provide insights into the specific challenges faced by dental assistants in implementing infection control practices, enabling stakeholders to address these issues effectively (Mustafa R. M., 2020).

Problem Definition

Infection control is a critical aspect of healthcare services, particularly in dental clinics, where the nature of procedures exposes patients and staff to a high risk of cross-contamination. Dental assistants play a key role in implementing infection

control protocols by sterilizing instruments, maintaining hygiene standards, and following established policies. However, inadequate awareness or improper application of infection control methods among dental assistants can lead to significant challenges, such as the increased risk of transmitting infectious diseases, reduced patient safety, and compromised trust in dental healthcare services.

The primary problem of this study lies in the potential gaps in awareness and understanding of infection control methods and policies among dental assistants in the Al-Qassim region. These gaps may arise due to insufficient training, lack of access to updated guidelines, or inconsistent enforcement of infection control standards in dental clinics (Bromberg & Brizuela., 2023).

The problems resulting from this issue are multifaceted:
- Ineffective infection control practices can contribute to the spread of infectious diseases such as hepatitis, HIV, and COVID-19 within dental clinics.
- Patients may experience complications, delayed recovery, or reluctance to seek dental care due to perceived risks.
- Dental assistants themselves are at risk of contracting and spreading infections if proper protocols are not followed.
- Public confidence in dental services may decline if infection outbreaks are linked to poor practices.

Based on the identified problem, the main question of this study is:

What is the level of awareness among dental assistants in Al-Qassim regarding infection control methods and policies, and how does it impact the implementation of these practices in dental clinics?

Importance of the Research

- **Scientific Importance:**

This study contributes to the growing body of knowledge on infection control in healthcare, specifically within dental settings, by focusing on the often-overlooked role of dental assistants. Understanding their awareness levels regarding infection control methods and policies provides valuable insights into how knowledge, training, and compliance influence infection prevention outcomes. The study also bridges a gap in existing literature by addressing the context of Al-Qassim, offering region-specific data that can inform broader discussions about infection control standards in Saudi Arabia and similar regions. The findings will enhance understanding of the challenges faced by dental assistants, thus laying a foundation for future research aimed at improving infection control education and practices (Mahasneh, 2020).

- **Practical Importance:**

From a practical standpoint, this study holds significant relevance for improving public health outcomes in dental clinics across Al-Qassim. By identifying gaps in awareness and understanding, the study can help healthcare administrators and policymakers design targeted training programs and implement effective infection control strategies tailored to the needs of dental assistants. These measures will directly reduce the risks of cross-contamination and healthcare-associated infections, ensuring safer environments for both patients and healthcare workers. Moreover, the study's recommendations can support dental clinics in achieving compliance with national and international infection control standards, thereby enhancing the overall quality and safety of dental services in the region (Prasad, 2019).

Research Objectives

Main Objective:

- To assess the awareness level of dental assistants in Al-Qassim regarding infection control methods and policies and to identify areas for improvement in their knowledge and practices.

Sub-Objectives:

1. **Evaluate Knowledge Levels**

   To measure the level of theoretical knowledge dental assistants possess about infection control methods, including sterilization techniques, personal protective equipment (PPE), and hand hygiene.

2. **Assess Policy Awareness:**

   To determine the extent to which dental assistants are familiar with local, national, and international infection control policies and guidelines applicable in dental settings.

3. **Identify Gaps in Training:**

   To explore whether dental assistants have received adequate and up-to-date training on infection control and to identify gaps in their educational preparation.

4. **Examine Compliance with Practices:**

   To assess how well dental assistants adhere to recommended infection control practices during their daily tasks in dental clinics.

5. **Provide Recommendations:**

   To propose actionable recommendations for improving the training, knowledge, and adherence to infection control practices among dental assistants, ultimately enhancing safety in dental care environments.

Study Questions

Main Question:

- What is the level of awareness among dental assistants in Al-Qassim regarding infection control methods and policies, and how does it impact their practices in dental clinics?

Sub-Questions:

1. **Knowledge Assessment:**
   What is the level of theoretical knowledge dental assistants possess about infection control methods, such as sterilization, hand hygiene, and the use of personal protective equipment (PPE)?

2. **Policy Familiarity:**
   To what extent are dental assistants familiar with infection control policies and guidelines at the local, national, and international levels?

3. **Training Adequacy:**
   Have dental assistants received sufficient and up-to-date training on infection control methods, and what are the gaps in their educational preparation?

4. **Practice Compliance:**
   How well do dental assistants adhere to infection control practices during their routine work in dental clinics?

5. **Improvement Needs:**
   What recommendations can be made to enhance the awareness, training, and implementation of infection control practices among dental assistants in Al-Qassim?

Study Hypotheses

Main Hypothesis:

- There is a significant relationship between the awareness level of dental assistants in Al-Qassim regarding infection control methods and policies and their adherence to infection control practices in dental clinics.

Sub-Hypotheses:

1. **Knowledge and Practices:**
   Dental assistants with higher levels of theoretical knowledge about infection control methods are more likely to adhere to recommended infection control practices.

2. **Policy Awareness and Compliance:**
   Dental assistants who are familiar with local, national, and international infection control policies demonstrate better compliance with infection control practices in their daily tasks.

3. **Training and Awareness:**
   Adequate and up-to-date training significantly improves the awareness level of dental assistants regarding infection control methods and policies.

4. **Gaps in Awareness:**
   There are identifiable gaps in the awareness levels of dental assistants that correlate with inconsistencies in infection control practices in dental clinics.

5. **Recommendations and Improvements:**
   Targeted recommendations and training programs based on the study's findings will significantly improve the awareness and application of infection control measures among dental assistants in Al-Qassim.

Research Domain and Limitations

- **Scope of the Study:**

This study focuses on assessing the awareness level of dental assistants in the Al-Qassim region regarding infection control methods and policies. The research covers theoretical knowledge, familiarity with infection control policies, and adherence to practical infection prevention measures. It targets dental assistants working in both public and private dental clinics in the region, aiming to provide insights into their awareness, training, and practice levels. The study also seeks to identify specific areas where knowledge or compliance is lacking and offer recommendations for improvements.

- **Limitations of the Study:**

1. **Geographic Limitation:**

   The study is confined to the Al-Qassim region, which may limit the generalizability of its findings to dental assistants in other regions of Saudi Arabia or other countries.

2. **Participant Sample:**

   The study focuses exclusively on dental assistants, excluding other healthcare professionals such as dentists or hygienists, whose practices may also impact infection control outcomes.

3. **Self-Reporting Bias:**

   Data collection relies on self-reported information through surveys or questionnaires, which may introduce bias due to over- or under-reporting of knowledge and practices by participants.

4. **Resource Constraints:**

   The study may face limitations in accessing comprehensive records or participants from smaller clinics that may not follow standardized policies or actively participate in such research.

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5. **Focus on Awareness:**

   While the study assesses awareness levels, it does not directly evaluate clinical outcomes or infection rates, which could provide additional context for understanding the impact of awareness on infection control practices.

Research Methodology

This study adopts a quantitative research methodology to assess the awareness level of dental assistants in Al-Qassim regarding infection control methods and policies. The quantitative approach is chosen due to its ability to collect and analyze numerical data, allowing for objective measurement and statistical analysis of participants' knowledge, training, and adherence to infection control practices.

The methodology will follow these key steps:

1. **Survey Design**

A structured survey questionnaire will be developed, consisting of closed-ended questions designed to measure dental assistants' knowledge of infection control methods, familiarity with infection control policies, and self-reported adherence to infection control practices. The questionnaire will utilize Likert-scale items to quantify responses, allowing for the assessment of attitudes and behaviors related to infection control.

2. **Sample Selection**

The target population for this study will be dental assistants working in both public and private dental clinics within the Al-Qassim region. A random sampling technique will be used to select participants to ensure a representative sample across various clinics. The sample size will be determined based on statistical power calculations to ensure the results are generalizable and statistically significant.

3. Data Collection

Data will be collected through the distribution of the survey questionnaire either online or in-person, depending on the preference and accessibility of the dental assistants. To ensure a high response rate, the survey will be distributed during working hours, with clear instructions provided regarding its completion and confidentiality.

4. Data Analysis

After the data is collected, it will be entered into statistical software (e.g., SPSS or Excel) for analysis. Descriptive statistics will be used to summarize the data, such as mean, median, and frequency distributions. Inferential statistical techniques, such as correlation analysis or regression modeling, will be employed to examine relationships between awareness levels and compliance with infection control practices.

5. Ethical Considerations

Ethical guidelines will be followed to ensure that all participants are informed about the study's objectives, confidentiality, and voluntary participation. Informed consent will be obtained from all participants, and they will be assured that their responses will remain anonymous and used solely for research purposes.

The quantitative methodology is ideal for this study as it allows for a systematic, objective, and measurable assessment of dental assistants' awareness levels, providing data that can be statistically analyzed to draw conclusions about the factors influencing infection control practices in dental clinics in Al-Qassim.

Previous Studies

As antiviral vaccines are still pending for the COVID-19 disease, improving dentists' knowledge and prevention measures is important. This study aimed to assess dentists' knowledge, attitude, and perception of COVID-19 in Saudi Arabia during the early

outbreak period. In addition, infection control measures for dental setting were also assessed. Online questionnaire was distributed to dentists in different regions of Saudi Arabia when COVID-19 outbreak in Saudi Arabia was at its beginning. The questionnaire was assessing demographic variables, knowledge, attitude, risk perception, and preparedness towards COVID-19. Questions regarding infection control measures were also included. The correct incubation period of the virus was recognized by 43% of participants. Fever, cough, and shortness of breath were the mostly recognized symptoms for COVID-19 (98.9%, 95.5%, and 93.3% respectively). Participants in age groups $\geq$60, 50–59, and 20–29 years old were more likely to perceive COVID-19 as a very dangerous disease compared to 30–39 and 40–49 age groups. Dentists in Saudi Arabia showed satisfactory knowledge and positive attitude towards COVID-19. Improving dentists' level of knowledge could be achieved through increasing their accessibility to materials provided by dental health care authorities, which specifies the best and safest approaches for dealing with patients during and after the outbreak   (Mustafa, 2020).

The emergence of life-threatening infectious diseases demands the implementation of efficient infection control practices in health care facilities. Failure to adhere to such infection control measures may lead to the spread of pathogens and microorganisms which damage the health of both the healthcare personnel and the community in general. This study aimed to assess the practices of infection control procedures among dental staff through the application of a health education program. It was an intervention study conducted at a dental clinic at Bilqas District in Dakahlia Governorate to assess the knowledge and attitude of staff concerning infection control practice. The study included the doctors and nurses (20 dentists and five nurses) working in the clinic. The results of the study revealed that there was a highly significant increase in infection control measures score and the total score; also, there was a significant increase in occupational safety measures score and waste disposal

score after the intervention. The infection control measures implemented by health care providers in their dental practice were effective. Hence, it is necessary to educate, raise awareness of professionals, and promote constant updating courses on procedures aiming at improving safety in the dentistry practices (Farahat, 2020).

The aim of the study of (Gökcek, 20233) is to measure the knowledge level of materials and equipment for endodontics and pedodontics, as well as sterilization and disinfection procedures, of dental assistants in dental institutions and intern oral and dental health technician students studying at college. Methods: 498 people, including dental assistants working in public, private and university institutions, between the ages of 18-65, and students of the Oral and Dental Health Technician School of universities, participated in the study. A written questionnaire was applied to the participants. With the help of the survey consisting of different questions, the participants' knowledge levels about pedodontic and endodontic materials and sterilization procedures were measured. Results: The knowledge level of dental assistants about dental materials was found to be low in 5.2% of the participants, medium in 32.5% of the participants, and high in 62.3% of the participants. There isn't any significant difference between the assistants' knowledge level and their gender (p=0.23), age group (p=0.09), educational status (p=0.41), professional experience (p=0.51), certification (p=0.39), and the institution that they work for (p=0.24). Conclusion: It was found that dental assistants have a lack of knowledge in this subject. It is thought that planning and perform regular training education programmes in terms of both acquiring new information and repeating existing information can be effective for eliminating the deficiencies of dental assistants.

(Esayah, 2024), as a dental healthcare team, we are exposed to many sources of infection. Dental laboratories play an important role in cross-contamination through their handling of contaminated impressions and dental prostheses. Introduction: The

dental laboratory personnel are at risk of contracting infection from a variety of microorganisms, including the covid-19 virus. To prevent viruses from spreading during the various stages of dental treatment, we should ensure a safe working environment. Aim of study: The purpose of this study was to assess "infection control" measures between dental laboratory technicians in Tripoli city during the COVID-19 pandemic. Samples and methods: We developed a pre-designed questionnaire consisting of four sections and different items related to infection control measures. 158 dental laboratory technicians in Tripoli city were surveyed using this questionnaire-based survey. The data were recorded and analyzed. Results: The study found that (92.9%) of dental technicians regularly followed hand hygiene protocols before and after dental impressions, models, and prostheses contact, (91.6%) washed their hands before and after using gloves, (92.3%) wear gloves when they receive jobs from the clinics, (89.7%) change gloves when they become torn, (86.5%) wear uniforms in the workplace, (73.5%) wear eye glasses/face shields (76.1%) and also, (79.4%) have received COVID vaccines. Conclusion: In Tripoli city, dental technicians are better trained and motivated to practice infection control measures in dental laboratories.

Eye injuries account for 3–4% of all occupational injuries; however, dental practitioners are at relatively high risk of occupational ocular incidents during their practices. The study aims to assess the attitude, knowledge, and awareness towards the safety of the eye; measures undertaken for its protection and its probable variations regarding age, gender, qualification, and years of practice among dental practitioners in Saudi Arabia (SA). In this cross-sectional study, 348 dental practitioners and dental staff from SA participated. Besides demography, information regarding their knowledge, attitude, perception towards eye safety protection, and measures followed was collected through a 28-questions structured questionnaire posted online. Among the participants, 47.4% were male, 52.6% female, and 55% dentists. The data revealed

that about 47% of the dentists were following clinical safety programs in their practice, 68% were employing a very high-level eye protection measure, whereas about 40% followed these measures just before starting the procedure, yet nearly 38% of the dentists faced ocular injury. Female practitioners had the highest level of knowledge on eye safety and protection. Multivariate binary logistic regression analysis showed that the awareness of the need for eye protection and inclusion of safety-glasses for UV protection were significant independent determinants of eye-injury incidence among dental professionals. This survey comprehensively profiles dental professionals' awareness and attitude about safety measures for their eye protection in their practice. Thus, the outcome of the study may pave the way for practicing an evidence-based safety approach towards the prevention of occupational ocular incidents in SA (Al-Mohaimeed, 2020).

Proposed Approach

The proposed approach for this study is designed to systematically assess the awareness level of dental assistants in Al-Qassim regarding infection control methods and policies through a structured, data-driven process. This approach includes multiple phases: planning, data collection, data analysis, and recommendations. By employing a quantitative research methodology, the approach focuses on obtaining measurable and objective data that can lead to actionable insights and improvements in infection control practices.

1. Literature Review and Background Research

The study will begin with a comprehensive literature review to explore existing research on infection control awareness among dental assistants. This review will identify common knowledge gaps, best practices, and training frameworks used globally and within Saudi Arabia. The review will also help establish the theoretical foundation for the study by identifying relevant infection control guidelines and policies recommended by global health organizations such as the World Health

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Organization (WHO) and the Centers for Disease Control and Prevention (CDC). This phase will guide the development of the survey instrument.

2. Survey Development

Based on the findings from the literature review, a detailed survey will be developed, focusing on key areas such as:

- Knowledge of Infection Control Methods: Questions will assess dental assistants' understanding of sterilization, hand hygiene, personal protective equipment (PPE), and infection transmission prevention.
- Awareness of Policies: Questions will evaluate how familiar dental assistants are with local, national, and international infection control policies and guidelines.
- Compliance with Practices: Questions will measure how well dental assistants adhere to infection control protocols during their daily tasks.
- Training and Education: Questions will explore the type and frequency of infection control training received by dental assistants and identify any gaps in their knowledge.

3. Sampling and Data Collection

A random sampling technique will be used to select dental assistants from various public and private dental clinics in the Al-Qassim region. The sample will be large enough to ensure statistical significance and diversity in responses. Data collection will be conducted through both online surveys (for accessibility) and in-person questionnaires (to reach those without access to digital platforms). The survey will be designed to take no more than 15-20 minutes to complete, ensuring minimal disruption to the participants' daily duties.

4. Data Analysis

Once the data is collected, statistical analysis will be performed using software such as SPSS or Excel. Descriptive statistics will summarize the demographic information

and responses to individual survey questions, providing an overview of the knowledge, training, and compliance levels. Inferential statistics, such as correlation analysis and regression models, will be used to identify relationships between the awareness levels and factors such as training, clinic type (public/private), and years of experience. This will allow the identification of specific variables that influence the adherence to infection control practices.

5. Interpretation and Reporting

The findings will be analyzed and interpreted to draw conclusions about the overall awareness levels of dental assistants in Al-Qassim. The study will compare the current state of knowledge and compliance with best practices and infection control guidelines. Recommendations will be made to address identified gaps, improve training programs, and implement strategies to enhance infection control practices in the region.

6. Recommendations and Implementation

Based on the study's findings, the proposed approach will include practical recommendations for:

- Targeted Training: Developing specialized training programs focused on the areas where dental assistants show the greatest knowledge gaps.
- Policy Reinforcement: Enhancing communication of infection control policies and ensuring consistent enforcement in dental clinics.
- Continuous Monitoring: Establishing ongoing assessments and refresher courses to maintain high levels of awareness and adherence to infection control methods.

The proposed approach is designed to provide actionable insights that can improve infection control practices in Al-Qassim's dental clinics, contributing to safer patient care and a healthier working environment for dental professionals.

Validation of the Proposed Approach

The proposed approach for this study is validated through a combination of methodological rigor, theoretical foundation, and alignment with best practices in public health research. Validation ensures that the study's design, data collection, and analysis are robust, reliable, and capable of producing valid and meaningful results. The validation process for this approach includes the following components:

1. Expert Review and Content Validity

To ensure that the survey accurately measures the awareness levels of dental assistants regarding infection control methods and policies, the survey instrument will be reviewed by subject matter experts (SMEs). These experts may include dental hygiene educators, infection control specialists, and public health researchers who will evaluate the relevance and clarity of the questions. This process ensures that the survey covers all necessary aspects of infection control, including sterilization procedures, use of personal protective equipment (PPE), hand hygiene, and knowledge of infection control policies. The expert review will also help refine the questionnaire to ensure it aligns with the key areas of infection control practice.

2. Pilot Testing

Before launching the full-scale data collection, a pilot test will be conducted with a small sample of dental assistants in Al-Qassim. This pilot phase will help identify any ambiguities in the questionnaire, assess the ease of completing the survey, and verify that the questions effectively capture the desired information. Feedback from participants in the pilot test will be used to modify the survey, ensuring clarity and reducing any potential biases or confusion during the data collection phase.

3. Reliability and Consistency

To assess the reliability of the survey, measures such as Cronbach's alpha will be used to evaluate the internal consistency of the survey instrument. A high Cronbach's alpha

value (typically above 0.70) indicates that the questions within the survey consistently measure the same construct (i.e., awareness of infection control practices). This will ensure that the survey produces reliable data that can be used for accurate analysis and conclusions.

4. Alignment with Established Infection Control Standards

The survey questions and methodology are designed to align with well-established infection control standards and guidelines from reputable organizations such as the World Health Organization (WHO), the Centers for Disease Control and Prevention (CDC), and Saudi Arabia's Ministry of Health. By using internationally recognized infection control frameworks, the proposed approach ensures that the study measures the most relevant aspects of infection control and provides results that are meaningful in both local and global contexts.

5. Statistical Validation

The quantitative nature of the study allows for statistical validation of the results. Through statistical methods like correlation analysis and regression modeling, the study will test the relationships between dental assistants' awareness levels and their adherence to infection control practices. The use of validated statistical tools ensures that the analysis is sound and that any correlations or conclusions drawn from the data are statistically significant.

6. Ethical Considerations

Ethical validation is integral to the study's approach. All participants will provide informed consent, ensuring they understand the purpose of the research, the voluntary nature of their participation, and their right to confidentiality. This ethical framework not only ensures the validity of the data but also upholds the integrity of the research process by fostering trust and transparency with participants.

7. Generalizability

The study's sample size and random sampling approach enhance its external validity, ensuring that the findings can be generalized to the broader population of dental assistants in Al-Qassim. While the study is region-specific, its findings will provide valuable insights that could be applicable to other regions in Saudi Arabia or similar healthcare settings globally.

Results

- Descriptive statistics

Descriptive statistics may also be used to characterize variations in observable attributes of components in a dataset. They may help us comprehend the aggregate features of the items in a data sample and serve as the foundation for testing hypotheses and generating predictions using inferential statistics (Ali, 2016).

By relying on Google Form, the questionnaire questions were created and distributed to dentists and assistants to obtain their responses. By presenting the questionnaire, 48 responses were obtained from the respondents in the experiment, and by relying on the SPSS program, I will move to analyze and obtain the results of the experiment.

Table 1: Descriptive statistics.

Statistics					
	Std. Deviation	Skewness	Std. Error of Skewness	Kurtosis	Std. Error of Kurtosis
How would you rate your familiarity with current infection control guidelines in healthcare facilities?	1.072	-.002	.343	-1.224	.674
Have you received regular training on infection control practices during your current position as a dental assistant?	.790	-.893	.343	.752	.674
How confident do you feel in applying infection control measures during dental procedures?	1.618	.614	.343	-1.342	.674
To what extent do you think your level of experience influences your awareness of infection control practices?	1.588	-.294	.343	-1.557	.674
How often do you seek updated information on new infection control protocols or guidelines?	.849	.176	.343	-.879	.674
Have you encountered any challenges in adhering to infection control practices in your workplace?	.984	-.119	.343	-1.053	.674
Do you believe that dental assistants with more training on infection control contribute to a safer healthcare environment?	1.368	.485	.343	-1.339	.674
How would you rate the support provided by your workplace in terms of maintaining infection control standards?	1.031	-.104	.343	.360	.674
In your opinion, what areas of infection control practices require additional training or improvement?	2.039	-.332	.343	-1.571	.674
How familiar are you with the latest technological advancements in infection control within dental settings?	1.339	-.716	.343	-.737	.674
How many years of experience do you have?	1.288	-.173	.343	-1.315	.674

- **Cronbach's alpha reliability and validity analysis**

Cronbach's alpha assesses the internal consistency or reliability of a group of questionnaire questions. Use this statistic to see whether a collection of objects consistently measures the same feature. Cronbach's alpha assesses the degree of agreement on a standardized scale of 0 to 1. Higher numbers imply better agreement between items (Tavakol, 2011).

From the Case Processing Summary table, we can conclude that the validity of the analyzable data is 100%, which indicates the strength of the data we obtained for analysis. As for Cronbach's Alphaa, which is equal to .932, which is very close to the

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correct one, which indicates the strength of the reliability and credibility of the data we have.

Validity:

- **Content Validity:** Ensures that the survey addresses all essential parts of the idea.
- **Construct Validity:** Confirms that the survey measures the specified theoretical notion.
- **Criterion-related Validity:** Determines how well the survey corresponds with external standards.

Range: Values between 0 and 1.

- **≥ 0.9**: Excellent reliability
- **0.8 - 0.9**: Good reliability
- **0.7 - 0.8**: Acceptable reliability
- **< 0.7**: Questionable or poor reliability

Table 2: Case Processing Summary.

Case Processing Summary		N	%
Cases	Valid	48	100.0
	Excluded[a]	0	.0
	Total	48	100.0
a. Listwise deletion based on all variables in the procedure.			

Table 3: Reliability Statistics.

Reliability Statistics		
Cronbach's Alpha[a]	Cronbach's Alpha Based on Standardized Items	N of Items
.932	.934	11

- **One-Way ANOVA**

One-Way ANOVA is a strong statistical procedure that compares the means of three or more independent groups to see whether they vary statistically significantly. Its fundamental significance stems from its ability to assess the means of numerous groups at once while avoiding the increased risk of Type I errors associated with multiple t-tests (jmp, 2021).

We can say that the degree of freedom between the variables is equal to 7, which indicates the convergence of the variables and the lack of dispersion between them, and their influence on each other.

Table 4: ANOVA analysis.

ANOVA					
Source	Sum of Squares	df	Mean Square	F	Sig.
Regression	105.354	7	3.193	2.533	.033
Residual	17.646	14	1.260		
Total	123.000	21			
a. Dependent Variable: dental.procedures					
b. Model: (Intercept), current.infection.contro, regular.training, experience, updated.information, challenges, assistants, control.standards, infection.areas, latest.technological					

Discussion

The results of this study, which aimed to assess the awareness level of dental assistants in Al-Qassim regarding infection control methods and policies, provide valuable insights into the current state of knowledge and practices in infection control within dental settings. The study utilized descriptive statistics, Cronbach's alpha reliability analysis, and One-Way ANOVA to analyze the data and test hypotheses.

The descriptive statistics revealed a variety of insights regarding the dental assistants' familiarity with infection control practices. Notably, the standard deviations and skewness values indicated varying levels of familiarity and confidence among the

respondents. For example, the question on familiarity with current infection control guidelines showed a relatively low standard deviation (1.072), suggesting a consistent level of awareness across the sample. In contrast, the question about confidence in applying infection control measures had a high standard deviation (1.618), reflecting a wider range of self-reported confidence levels. This variation highlights the need for tailored training and support to improve adherence to infection control practices among dental assistants with varying levels of confidence.

The Cronbach's alpha value of 0.932, indicating excellent reliability, further validates the strength of the data and the consistency of the survey instrument. The high reliability suggests that the survey items are coherent and consistently measure the same concept, ensuring that the study's conclusions are based on solid and dependable data.

The One-Way ANOVA results demonstrated significant relationships between several variables, including training, experience, and challenges faced in applying infection control practices. The regression model's F-value of 2.533 and the significance level of 0.033 suggest that factors like regular training, updated information, and workplace support have a statistically significant impact on the dental assistants' awareness and application of infection control measures. These findings imply that interventions targeting these variables could lead to improvements in infection control practices.

Conclusion

This study confirms that dental assistants in Al-Qassim exhibit varying levels of awareness and adherence to infection control guidelines, with some participants reporting high levels of confidence in their practices, while others acknowledge challenges in applying these practices effectively. The findings suggest that while most dental assistants are familiar with basic infection control protocols, there is a need for more frequent training and updated information to ensure consistent

implementation across all dental practices. Additionally, the study reveals that experience, continuous training, and support from dental workplaces significantly contribute to improving the awareness and confidence of dental assistants in infection control methods.

Future Work

While this study provides valuable insights into the current state of infection control awareness among dental assistants in Al-Qassim, further research is needed to expand on these findings. Future studies could focus on the following:

1. Conducting longitudinal studies to assess how infection control awareness evolves over time, especially after the implementation of specific training programs or policy changes.

2. Supplementing quantitative data with qualitative research, such as interviews or focus groups, to understand the deeper reasons behind challenges faced by dental assistants in adhering to infection control measures.

3. Extending the study to other regions in Saudi Arabia to compare infection control awareness across different regions, considering variations in healthcare infrastructure and training programs.

4. Exploring the role of emerging technologies, such as digital sterilization systems and real-time infection control monitoring tools, in enhancing dental assistants' awareness and adherence to infection control protocols.

5. Assessing the effectiveness of specific training interventions and the frequency of refreshers on improving infection control practices and knowledge retention among dental assistants.

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