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Review Article

Assessment of attitude and knowledge of infection control practices amongst UG dental students in Uttarakhand towards immunocompromised patients undergoing treatment - A questionnaire based study

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ABSTRACT

Aim: This study aimed to assess the attitude and knowledge of infection control practices amongst undergraduate (UG) dental students in Uttarakhand towards immunocompromised patients undergoing dental treatment.

Objective: The objective was to evaluate the level of awareness and adherence to infection control protocols among UG dental students in Uttarakhand and to identify any gaps in knowledge or attitude towards treating immunocompromised patients.

Materials and Methods: A questionnaire-based survey was conducted, comprising questions related to infection control practices and attitudes towards treating immunocompromised patients. The survey was distributed to 300 UG dental students across multiple dental colleges in Uttarakhand. Data collected were analyzed using statistical methods to identify trends and assess knowledge levels.

Results: The results revealed varying levels of awareness and adherence to infection control practices among UG dental students. While a majority demonstrated adequate knowledge, there were notable gaps in understanding specific protocols related to treating immunocompromised patients. Additionally, attitudes towards such patients varied, with some students expressing hesitation or uncertainty in providing treatment.

Conclusion: This study underscores the importance of ongoing education and training in infection control practices among dental students, particularly concerning the treatment of immunocompromised patients. Addressing knowledge gaps and fostering a positive attitude towards providing care for this vulnerable population is essential to ensure optimal patient outcomes and minimize the risk of infection transmission.

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1. Introduction

Health-care workers are key players in prevention and management of HIV-Infection¹⁻³ and other diseases that may compromise the immune system. Infection control practices are fundamental in maintaining the safety and well-being of patients and healthcare providers within dental settings. The risk of infectious disease transmission is

particularly heightened when treating immunocompromised patients, who possess weakened immune systems, rendering them more susceptible to infections. As such, ensuring that undergraduate (UG) dental students possess adequate knowledge and demonstrate appropriate attitudes towards infection control practices is paramount in safeguarding the health of both patients and providers.

Vaccination being the best method of infection control, worldwide policies have been implemented to reduce or

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eliminate the risk of epidemics that have had some success, and several infectious diseases have been largely eradicated or are under control in the western world as a result of national vaccination programs.⁴ Vaccinations for HIV⁵ and hepatitis⁶ are being provided to susceptible patients so as to decrease the spread of infection further.

Uttarakhand, a state nestled in the northern region of India, boasts several dental colleges training the next generation of dental professionals. However, the extent to which UG dental students in Uttarakhand adhere to infection control protocols and their attitudes towards treating immunocompromised patients remain areas of inquiry warranting investigation.

This article presents the findings of a questionnaire-based survey conducted among UG dental students in Uttarakhand, aimed at assessing their attitude and knowledge of infection control practices concerning immunocompromised patients undergoing dental treatment. By elucidating the prevailing practices and attitudes among this cohort, the study seeks to identify potential areas for improvement and inform educational interventions geared towards enhancing infection control protocols and fostering a patient-centered approach to care. Achieving disinfection and sterilization through the use of disinfectants and sterilization practices is essential for ensuring that medical and surgical instruments do not transmit infectious pathogens to patients.⁷

The significance of this study lies in its potential to shed light on the current state of infection control awareness and adherence among UG dental students in Uttarakhand particularly in the context of treating immunocompromised patients suffering from diseases such as HIV, tuberculosis, Hepatitis B and C, COVID-19.⁸ Moreover, the findings hold implications for dental education curriculum development, as well as for dental practice guidelines aimed at ensuring the provision of safe and effective care to all patient populations. The in-depth study of immune dysfunction in HIV disease has shed light on the role of the immune system in surveillance against a variety of neoplastic diseases, such as non-Hodgkin lymphoma and Kaposi sarcoma. As a result of its association with HIV/AIDS, Kaposi sarcoma was discovered to be caused by human herpes virus 8.⁹ Oral manifestations^{10,11} of HIV includes oral candidiasis, hairy leukoplakia, Kaposi sarcoma, linear gingival erythema, necrotizing ulcerative periodontitis, aphthous ulcer.¹²

Through an exploration of the attitudes and knowledge of UG dental students towards infection control practices, this study aims to contribute to the ongoing efforts to enhance patient safety and quality of care within dental settings and hospital hygiene.¹³ ultimately advancing the overarching goals of public health and healthcare delivery in Uttarakhand and beyond.

2. Materials and Methods

2.1. Study design

This study employed a questionnaire-based survey design to assess the attitude and knowledge of undergraduate (UG) dental students in Uttarakhand towards infection control practices concerning immunocompromised patients undergoing dental treatment.

2.2. Participant recruitment

Participants were recruited from multiple dental colleges across Uttarakhand. The inclusion criteria stipulated that participants must be currently enrolled as UG dental students in these institutions. Participation in the survey was voluntary, and informed consent was obtained from all participants prior to their involvement in the study.

2.3. Questionnaire development

A structured questionnaire was developed based on a thorough review of relevant literature and guidelines pertaining to infection control practices in dental settings. The questionnaire comprised sections addressing various aspects of infection control, including hand hygiene, personal protective equipment (PPE) use, disinfection and sterilization procedures, and attitudes towards treating immunocompromised patients. The questionnaire underwent pilot testing among a small group of dental students to assess its clarity, comprehensibility, and relevance. Feedback obtained from the pilot testing was used to refine the questionnaire for improved validity and reliability.

2.4. Survey administration

The survey was administered electronically to UG dental students via email or online survey platforms. Participants were provided with a link to the survey along with a cover letter explaining the purpose of the study and assuring confidentiality of their responses. Participants were given a specified period (e.g., two weeks) to complete the survey, and reminders were sent periodically to encourage participation and ensure a sufficient response rate.

2.5. Data collection

Data collected through the survey included demographic information (e.g., age, gender, year of study) and responses to questions pertaining to infection control practices and attitudes towards treating immunocompromised patients. Responses were anonymized to ensure confidentiality, and only aggregate data were analyzed to maintain participant anonymity.

2.6. Data analysis

Descriptive statistical analysis was conducted to summarize the survey responses. Frequencies and percentages were calculated for categorical variables, while measures of central tendency and dispersion were computed for continuous variables, where applicable. Inferential statistical analyses, such as chi-square tests or regression analysis, were employed to identify associations or correlations between variables.

2.7. Statistical analysis

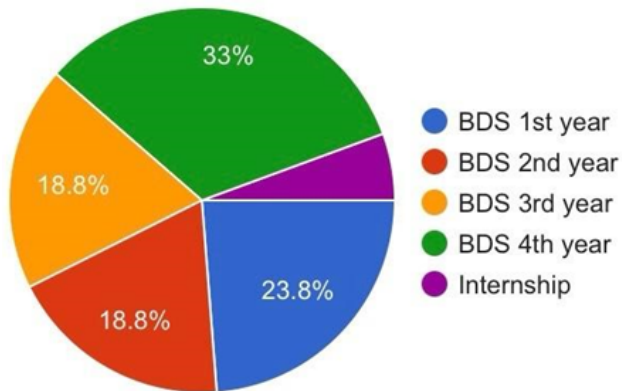


Figure 1: Current academic year

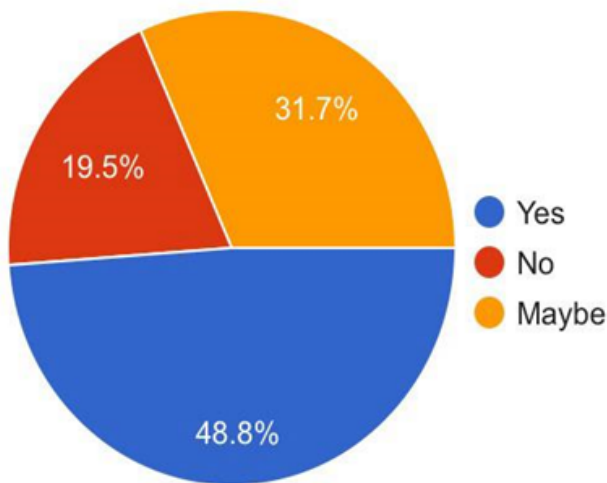


Figure 2: Should you treat immunocompromised patients?

3. Results

Out of the 300 UG dental students who participated in the survey, the majority were in BDS 4th year followed by BDS 1st year.

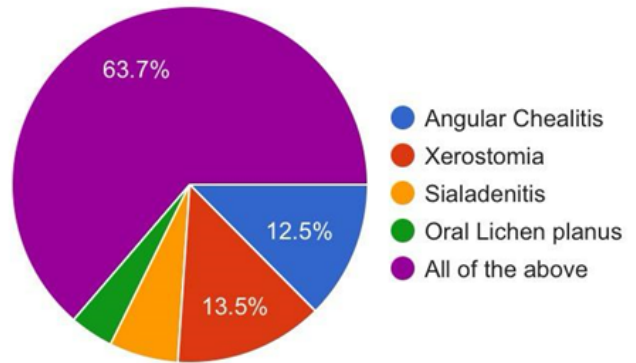


Figure 3: What are the oral manifestations of hepatitis?

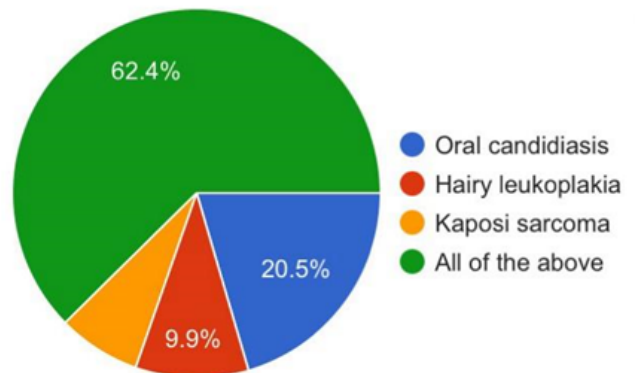


Figure 4: Being a dentist, what common features will you observe in HIV patients?

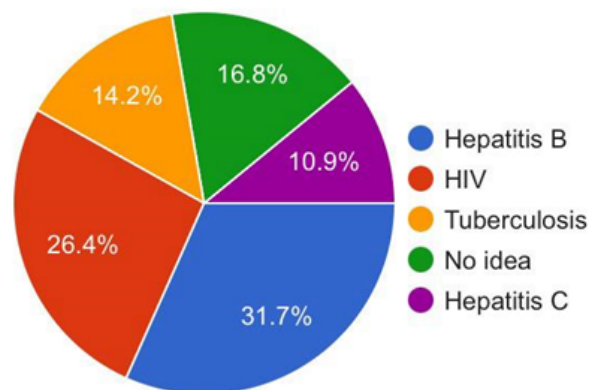


Figure 5: Being dentist, what common features will you observe in HIV patients?

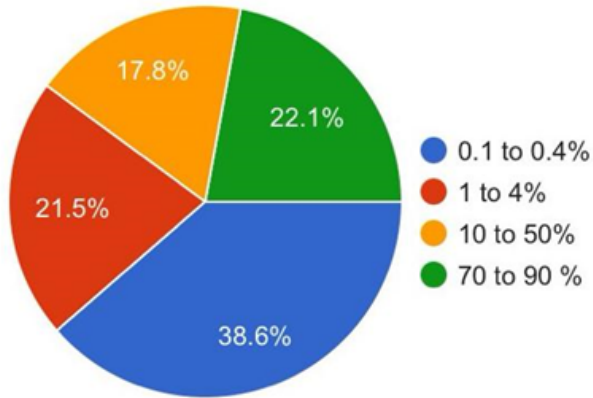


Figure 6: What are the chances of HIV transmission after a single contaminated needle stick injury?

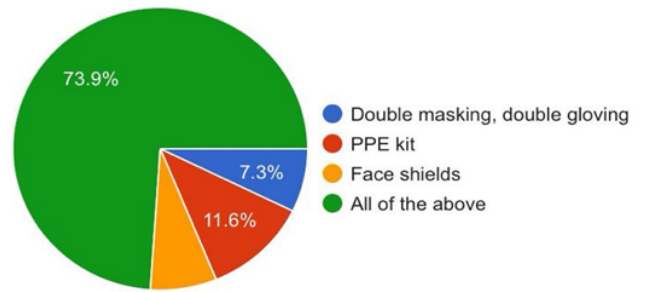


Figure 9: Are you aware of the universal precautions to be taken while treating immunocompromised patients?

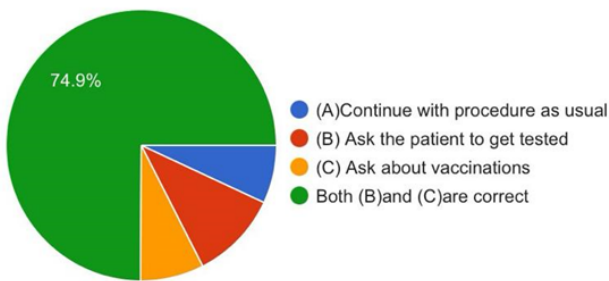


Figure 7: In case of suspected immunocompromised patients, what will you preferably do?

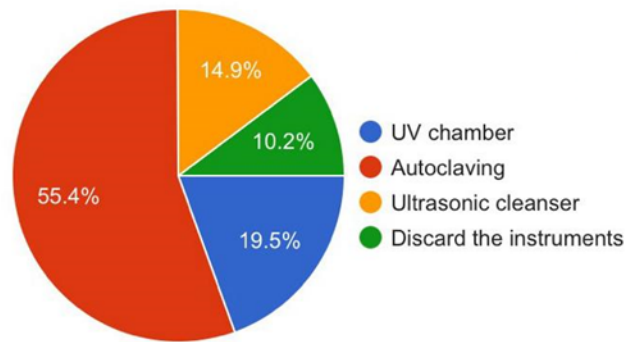


Figure 10: After the procedure has been done what is the way of sterilization of instruments?

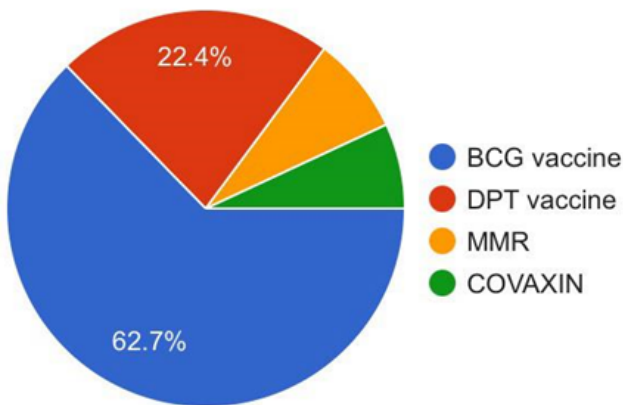


Figure 8: Are you aware about vaccinations for tuberculosis?

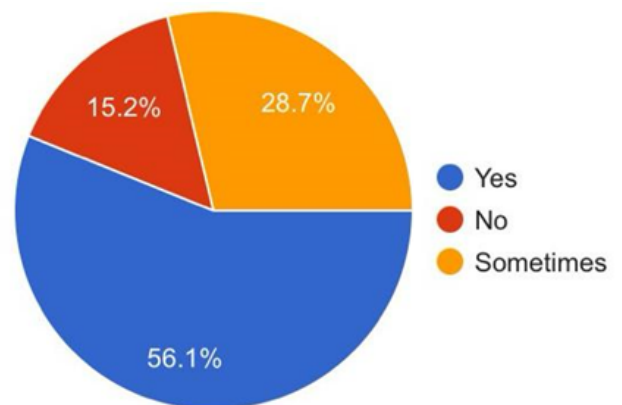


Figure 11: Do you disinfect your working area, dental chairs and spittoon between patients?

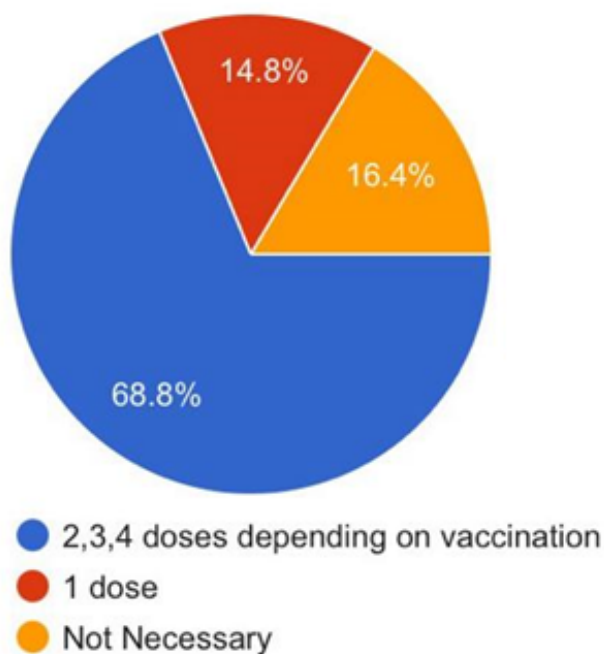


Figure 12: Are you aware of hepatitis vaccination schedule for dental practitioners?

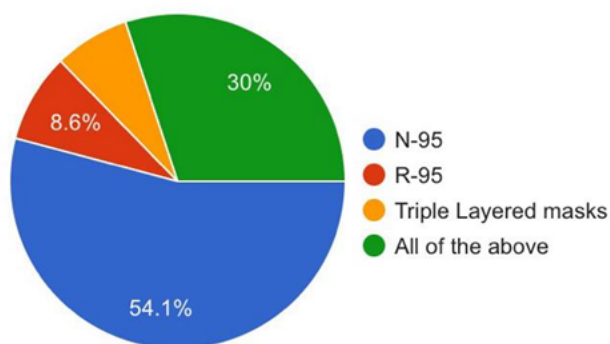


Figure 13: Are you aware of mask certified by OSHA/FDA guidelines?

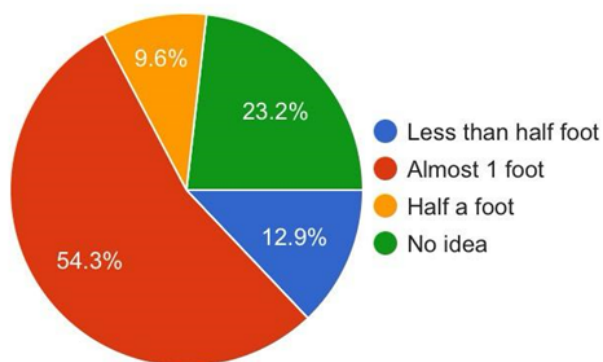


Figure 14: How much distance is to be maintained between eyes and working field during dental procedures?

3.1. Knowledge of infection control practices

Overall, the survey revealed a high level of knowledge among UG dental students regarding infection control practices. When asked about safe working distance¹⁴ from the patient 54.3% responded correctly. Similarly, 73.9% of participants demonstrated awareness of the appropriate sequence for donning and doffing personal protective equipment (PPE).

3.2. Adherence to infection control protocols

While knowledge of infection control practices was high, adherence to these protocols varied among UG dental students. Approximately 73.9% of respondents reported consistently wearing appropriate PPE during patient care activities. However, only 56.1% indicated regular compliance with surface disinfection protocols between patient encounters.

3.3. Attitudes towards treating immunocompromised patients

Attitudes towards treating immunocompromised patients were generally positive among UG dental students, with 48.8% expressing willingness to provide dental care to this patient population. However, a subset of respondents (19.5%) reported feeling apprehensive or uncertain about treating immunocompromised patients due to concerns about infection transmission.

3.4. Association between knowledge and attitudes

Statistical analysis revealed a significant association between knowledge of infection control practices and attitudes towards treating immunocompromised patients. Participants who demonstrated higher levels of knowledge tended to exhibit more positive attitudes towards providing dental care to immunocompromised patients.

4. Discussion

In conclusion, the findings of this survey highlight both strengths and areas for improvement in the infection control practices and attitudes of undergraduate dental students in Uttarakhand. While the majority of participants demonstrated a commendable level of knowledge regarding infection control protocols, discrepancies in adherence to these protocols were observed, particularly concerning surface disinfection¹⁵ procedures. This suggests a need for targeted educational interventions and practical training sessions to bridge the gap between knowledge and practice. Modifications to PPE design, such as tabs to grab, may decrease the risk of contamination. For donning and doffing procedures, following CDC doffing guidance, a one-step glove and gown removal, double-gloving, spoken instructions during doffing, and using glove disinfection¹⁶

may reduce contamination and increase compliance.¹⁷

Moreover, the positive attitudes expressed by most respondents towards treating immunocompromised patients are encouraging. However, the apprehension reported by a subset of students underscores the importance of addressing concerns and providing adequate support and training to ensure confidence and competence in providing care to this vulnerable patient population.

Moving forward, collaborative efforts between dental education institutions, regulatory bodies, and public health authorities are crucial in implementing evidence-based strategies to enhance infection control practices among dental students. Regular audits, continuous education on injury management should be introduced for both undergraduate and graduate students¹⁸ and updates to curricula can help reinforce adherence to infection control protocols and foster a culture of patient safety and quality care within dental settings.

Furthermore, initiatives aimed at promoting inter professional collaboration and communication among dental professionals, healthcare providers, and patients can contribute to a holistic approach to infection prevention and control. By prioritizing patient-centred care and maintaining a commitment to excellence in infection control practices, dental professionals can uphold the highest standards of safety and quality in dental care delivery. It is essential for practicing dentists to have adequate knowledge of HIV/AIDS and its implications in the dental practice.¹⁰

In spite of newer modalities for diagnosis and treatment, HIV/AIDS killed 3 million people each year, TB kills 2 million people² around the globe.

5. Conclusion

In conclusion, while this survey provides valuable insights into the current state of infection control awareness and practices among dental students in Uttarakhand, further research and ongoing efforts are needed to continuously improve and evolve infection control protocols and attitudes towards patient care in dental education and practice. By embracing a culture of continuous learning and improvement, dental professionals can ensure the safety and well-being of patients and contribute to the overall advancement of dental healthcare due to the potential of saliva to transmit hepatitis B virus infection¹ and other diseases also. Continuing dental education (CDE) programmes should be conducted on a regular basis for updating level of the dental practitioners towards the dental treatment of patients with HIV/AIDS patients.¹⁹

6. Source of Funding

None.

7. Conflicts of Interest

There are no conflicts of interest.

References

- Karayiannis P, Novick DM, Lok AS, Fowler MJ, Monjardino J, Thomas HC, et al. Hepatitis B virus DNA in saliva, urine, and seminal fluid of carriers of hepatitis B e antigen. *Br Med J (Clin Res Ed)*. 1985;290(6485):1853. doi:10.1136/bmj.290.6485.1853.
- Sandhu GK. Tuberculosis: current situation, challenges and overview of its control programs in India. *J Glob Infect Dis*. 2011;3(2):143–50.
- Taiwo O. Dental practice, human immunodeficiency virus transmission and occupational risks: views from a teaching hospital in Nigeria. *Ann Med Health Sci Res*. 2014;4(2):94–8.
- Corstjens PL, Abrams WR, Malamud D. Saliva and viral infections. *Periodontol 2000*. 2000;70(1):93–110.
- Hargrave A, Mustafa AS, Hanif A, Tunio JH, Hanif SNM. Current Status of HIV-1 Vaccines. *Vaccines (Basel)*. 2021;9(9):1026. doi:10.3390/vaccines9091026.
- Elbahrawy A, Atalla H, Alborae M, Alwassief A, Madian A, Fayoumie ME, et al. Recent Advances in Protective Vaccines against Hepatitis Viruses: A Narrative Review. *Viruses*. 2023;15(1):214. doi:10.3390/v15010214.
- Rutala WA, Weber DJ. Disinfection and Sterilization in Health Care Facilities: An Overview and Current Issues. *Infect Dis Clin North Am*. 2016;30(3):609–37.
- Chen Q, Zu ZY, Jiang MD, Lu L, Lu GM, Zhang LJ, et al. Infection Control and Management Strategy for COVID-19 in the Radiology Department: Focusing on Experiences from China. *Korean J Radiol*. 2020;21(7):851–8.
- Schwetz TA, Fauci AS. The Extended Impact of Human Immunodeficiency Virus/AIDS Research. *J Infect Dis*. 2019;219(1):6–9.
- Alali FM, Tarakji B, Alqahtani AS, Alqhtani NR, Nabhan AB, Alenzi A, et al. Assessment of Knowledge and Attitude of Dental Students towards HIV and Its Oral Manifestations in Saudi Arabia-A Cross-Sectional Study. *Healthcare (Basel)*. 2022;10(8):1379. doi:10.3390/healthcare10081379.
- Datar UV, Kamat M, Khairnar M, Wadgave U, Desai KM. Needlestick and sharps' injury in healthcare students: Prevalence, knowledge, attitude and practice. *J Family Med Prim Care*. 2022;11(10):6327–33.
- Pakfetrat A, Falaki F, Delavarian Z, Dalirsani Z, Sanatkhan M, Marani M, et al. Oral manifestations of human immunodeficiency virus-infected patients. *Iran J Otorhinolaryngol*. 2015;27(78):43–54.
- 10.3205/dgkh000410. Infection prevention requirements for the medical care of immunosuppressed patients: recommendations of the Commission for Hospital Hygiene and Infection Prevention (KRINKO) at the Robert Koch Institute. *GMS Hyg Infect Control*. 2022;17:7. doi:10.3205/dgkh000410.
- Hwang K. A safe distance between doctor and patient. *Arch Plast Surg*. 2020;47(3):201–2.
- Laneve E, Raddato B, Dioguardi M, Gioia GD, Troiano G, Muzio LL. Sterilisation in Dentistry: A Review of the Literature. *Int J Dent*. 2019;p. 6507286. doi:10.1155/2019/6507286.
- Li K, Han S, Yang Z, Zhang M, Zhang J. Feasibility and effectiveness of disinfection of gloves during routine care: a scoping review protocol. *BMJ Open*. 2023;13(3):66310. doi:10.1136/bmjopen-2022-06631.
- Verbeek JH, Rajamaki B, Ijaz S, Sauni R, Toomey E, Blackwood B, et al. Personal protective equipment for preventing highly infectious diseases due to exposure to contaminated body fluids in healthcare staff. *Cochrane Database Syst Rev*. 2020;4(4):CD011621. doi:10.1002/14651858.CD011621.
- El-Saaidi C, Dadras O, Musumari PM, Ono-Kihara M, Kihara M. Infection Control Knowledge, Attitudes, and Practices among Students of Public Dental Schools in Egypt. *Int J Environ Res Public Health*. 2009;18(12):6248. doi:10.3390/ijerph18126248.
- Oberoi SS, Sharma N, Mohanty V, Marya C, Rekh A, Oberoi A, et al. Knowledge and Attitude of Faculty Members Working in Dental


Institutions towards the Dental Treatment of Patients with HIV/AIDS.
Int Sch Res Notices. 2014;p. 429692. doi:10.1155/2014/429692.

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