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Research Paper

Knowledge, Attitudes, and Practice of Dental Students Towards Infection Control Measures at Sirt University, Libya

Zahera Moftah Elmabrouk[1], Omakhair Hasan Abdelaziz[2]
[1] *Head of the prosthodontics department, faculty of dentistry, Sirt University, Sirt, Libya*
[2] *Lecturer, oral medicine department, faculty of dentistry, Sirt University, Sirt, Libya*

Abstract:
Among the numerous risks faced by oral health care practitioners is the potential for cross-infection with blood-borne infections. Many different types of germs can be readily spread at a dental clinic, including viruses, bacteria, and hepatitis C and B.
Aim*: to evaluate knowledge, attitude and practice of the recommended infection control procedures among undergraduate dental students at dental school/ Sirt University, Libya.*
Materials and Methods:
This study was a cross-sectional study. It was considered that previously used questionnaire (Royal College of Medicine Perak). Would add strength to our study and hence only minor changes were made to it. A random sampling of Libyan dental students filled out three section questions regarding knowledge, awareness, attitude, and barriers towards the Evidence-based infection control measures.
Results: *There were 76 dental students (3rd, 4th, and internship years): 87% female and 13% male. The survey found that 90% of participants believe hand hygiene requires plain soap, anti-microbial hand washes alcoholic hand rubs, or waterless antiseptics. More than 61 % of the study supposed that the personal protective equipment (PPE) will protect patients' health workers and visitors.86% of the research sample concur that (PPE) mitigates, but does not entirely eradicate, the infection risk acquisition Standard precautions of IC were not followed by many dentists. For example, 31 dentists (30.4%) twisted needles after each usage, 23 dentists (30.3%) did not wear gowns, and 4 dentists.*(%5.2)
Conclusion: More efforts must be spent to improve students' attitudes and compliance with infection control policy. Also, a continual and thorough evaluation of student's knowledge and application of infection control measures must be conducted to achieve optimal performance by our dental students in patient care.
Keywords*: Infection control, dental students, knowledge and attitude.*

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I. Introduction

The disinfection protocol in the field of dentistry is focused on preventing nosocomial or healthcare-associated infections. Infection universal precautions dictate that the same infection control measures are applied to all patients; hence, dental professionals are required to adhere to universal precautions and consider all patients as potentially infectious. During dental procedures, both patients and practitioners face the danger of exposure to extremely infectious bacteria. (1)

This may include several viruses such as herpes simplex virus, hepatitis B and C viruses, cytomegalovirus, and human immunodeficiency virus, as well as numerous pathogenic bacteria found in the mouth cavity and respiratory tract, including Staphylococcus and Streptococcus species (2).

Infection control in dental clinics is essential to ensure the protection and safety of patients and the dental team. The nature of dental procedures which often involve exposure to blood, saliva, and other bodily fluids, and respiratory aerosol, force strict infection control measures that are crucial to prevent the spread of infections and diseases.

The disinfection protocol in dental clinics involves multiple steps for correct control in cross-infection between patients and the dental team or from one patient to another.

Hand Hygiene

Washing hands thoroughly before and after patient care is fundamental. This should involve using soap and water or an alcohol-based hand disinfectant also the use of gloves to minimize the risk of cross-contamination. However, the use of Personal Protective Equipment (PPE), The dentist and dental team must wear appropriate PPE such as gloves, masks, face shields, and protective eyewear to prevent exposure to infectious materials, Disposable gowns or lab coats are also recommended for additional protection, all surfaces in the dental operatory, including counters, chairs, and light handles should be cleaned and disinfected between each patient using appropriate disinfection. Barriers (dental rabe) can also be used on frequently touched surfaces to reduce the need for constant cleaning [(4)].

Aseptic Techniques

tool Maintain a clean and sterile field during procedures to avoid contamination and materials should only be touched with sterile instruments or gloves, ensuring that items like dental fillings or crowns remain contaminant-free[(5)].

Patient Screening and Health History

Before any procedure, a thorough health history should be taken to assess for any contagious diseases, such as hepatitis or HIV, and make decisions on additional precautions. It's important to know if a patient is immunocompromised or has conditions that may increase their risk of infection.

Airborne Infection Control

Dental offices must have proper ventilation systems in place to reduce the risk of airborne infections, especially during procedures that generate aerosols High-volume suction devices and rubber dams can help reduce the spread of saliva or blood splatter.

Vaccination

Dental students, professionals, and dental nurses should be vaccinated against hepatitis B, influenza, and other diseases where vaccines are available to protect both themselves and patients.

Patient Education

Patients should be educated about maintaining good oral hygiene at home to minimize infections and complications after dental procedures. Infection control standards vary slightly depending on the region, but they all have a similar goal of minimizing risks and maintaining a safe environment for everyone in the dental setting [(5)].

Guidelines for Infection Control in Dental Health-Care Settings 2003 was published by the CDC in collaboration with infection control experts from a variety of federal agencies, academic institutions, and private and public sector organizations. [(3).] The compliance of DHCP with these principles has been previously examined globally, revealing discrepancies in dentists' knowledge. Nonetheless, to the researcher's knowledge, information concerning the dentistry university in Libya is scarce and virtually absent in Sirt. The current study tries to evaluate the knowledge, attitudes, and practices of infection control methods at Sirt Dental University in Sirt, Libya. Dental healthcare personnel require training in the appropriate management of medical waste. Numerous regulated wastes can be produced during dental procedures, posing risks to both the environment and individuals who come into touch with them if not managed appropriately. The Centers for Disease Control has promulgated guidelines for Environmental Infection Control in healthcare facilities, including the segregation and labeling of medical waste, along with comprehensive and secure disposal techniques [(4)].

In a dental teaching hospital where numerous patients are treated by less experienced undergraduate students, it is imperative to emphasize infection control measures and rigorously comply with infection control guidelines. Increased efforts and time must be dedicated to student training in infection control due to a heightened risk of cross-contamination compared to more experienced dentists, potentially endangering themselves and their patients. [(2)]

II. Materials and Methods

This cross-sectional survey was directed to senior undergraduate dental students, at the Faculty of Dentistry, Sirt University. In clinical education and dealing with patients. Dental students were involved in clinical training starting in their 3rd, and 4th-year dental school, the questionnaire was distributed among 3rd, 4th- and internship students, and the students were requested to fill out the questionnaire items in the lecture hall without discussion in 15 min. Students who agreed to participate in the study signed the consent form before answering the questionnaire.

The questionnaire (Royal College of Medicine Perak). Would add strength to our study and hence only minor changes were made to it consisting of three sections. The initial section addressed the general background through four inquiries concerning gender, educational attainment, and years of experience. The second section addressed infection control knowledge through six items evaluating healthcare providers on sources of infection

control knowledge, infectious diseases, and their transmission, immunization, and occupational accidents. The third section comprised five questions regarding attitudes toward infection control in dental clinics. Hand hygiene, personal protective equipment, disposal of sharp instruments, medical waste management, sterilization of dental instruments, use of surface barriers, and impression disinfection are critical components of infection control in dental practice.

Ethical permission was secured by the College of Dentistry at the University of Sirt. The study was done in the Department of Prosthodontics and Preventive Dentistry, College of Dentistry, University of Sirt in 2024. Statistical analysis was performed using frequency, and data analyses were executed using SPSS version 24.

III. Result

Table 1: Student's distribution according to gender and socio-demographic character

variable		frequency	%
Gender	**Male**	10	13
	female	66	87
3rd year		27	35.5
4th year		24	31.6
Intern ships		25	32.7
Source of infection control .information	**Lecturers**	54	55
	Hospital staffs	25	32.7
	others	19	15.7

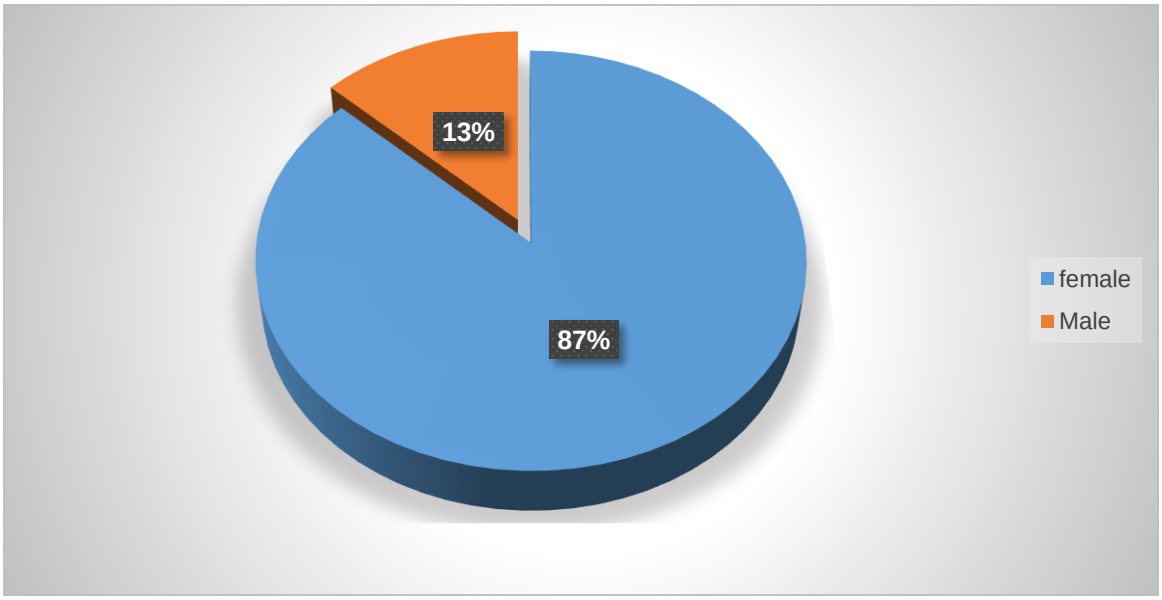

Figure 1: Percentage of female and male participants in the study

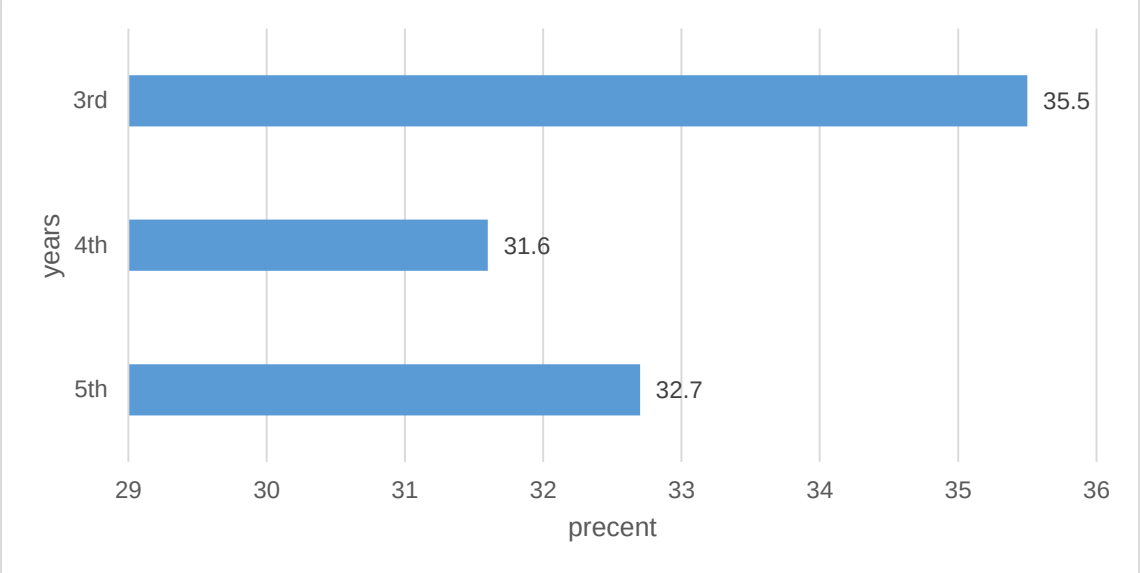

Figure 2: Percentage of participating students in the study according to academic year's

Table 2: Infection control attitude

Questions		**Frequency**	**%**
Do you think it is important to prevent cross-infection in healthcare settings?	Yes	71	93.4
	No	5	6.5
standard disinfection protocol must be applied to all patients at all times regardless of diagnosis or infectious status	Yes	68	89.4
	No	8	10.6
Do not agree that using tap water only is enough for hand washing.	Yes	69	90.7
	No	7	9.3
Agree that accurate hand washing can minimize cross-infection with micro-organisms.	YES	8	7.5
	No	68	89.5
Appropriately disinfected and/ or destroyed as per the national standards or guidelines.	Yes	65	9.2
	No	11	85.5
Agree that using soap, anti-microbial agents such as an alcoholic hand rub or waterless antiseptic agent is essential in hand hygiene.	Yes	68	89.5
	No	8	10.5
.PPE helps lower the risk of getting an infection, but it doesn't completely remove the risk	Yes	11	14.5
	No	65	85.5
The usage of PPE will protect patient's health workers and visitors.	Yes	26	34.2
	No	47	61.8

Table 3: Student practices and awareness towards the spread of infection as well as attitude towards treatment of patients with infectious diseases

Questions		Frequency	%
Wearing gloves	Yes	74	97.3
	No	2	2.6
Hand washing	Yes	52	78.4
	No	24	31.5
Warring mask	Yes	72	94.7
	No	4	5,2
Environmental cleaning and spills – management.	Yes	41	53.9
	No	35	46,1
Correct handling of patient care equipment and soiled linen	Yes	27	35.5
	No	50	65.7
Acute handling of healthcare wastes/sharps blood, body organs, specimens, body fluids, excretions, and secretion	Yes	31	40.7
	No	45	59.3
Prevention of needle-stick/sharp injuries.	Yes	45	59.3

	No	31	40.7
Use of personal protective laboratory coat and/or scrubs	Yes	53	69.7
	No	23	30.3

IV. Discussion

The current study aimed to assess dental students' knowledge, attitudes, and behaviors concerning infection control protocols at Sirt University, Libya. The Faculty of Dentistry at Sirt Institution of Higher Education Every health center or dental clinic must have policies to reduce the transfer of infectious and communicable illnesses.

Dental healthcare practitioners need to recognize the risks and severity of infections. The findings of this study demonstrate inadequate adherence to the recommended cross-infection protocol among dental students at Sirt University, despite their acceptable level of knowledge and attitude. This divergence between knowledge and attitude may stem from an insufficient provision of PPE negligence, and incorrect disposal of medical waste. Although research indicates enhanced compliance with barrier use in numerous countries, dentists' adherence to all infection control standards and standard procedures needs further enhancement. The present study found that students adhered to glove usage at a high rate of 97.36%, which is comparable to previous studies in Yemen (96.6%) and Saudi Arabia (99.3%)[. (7)] (100%)[(14).] United Arab Emirates (100%),[(15).] Brazil (99.5%), (5). Canada (100%), Iran, and the United Kingdom [(7,8).]

Despite evidence of enhanced agreement with protocol use in numerous countries, dentists' adherence to all infection control standards and protocols needs further development. Despite the current study's student compliance rate for glove usage being high (97.36%), it was comparable to previous findings from research conducted in Yemen (96.6%)[. (8).] 99.3 percent Kingdom of Saudi Arabia (100%)[(15).] United Arab Emirates (100%) [(15).] Brazil (99.5%) [(5),] including Iran,[(9)] the UK, Canada (100%), and 11.%) [(7, 8)].

Utilization of additional protective barriers such as face masks (94.7%) and laboratory coats and/or scrubs (69.7%) result was inferior to the findings obtained in prior research [(10, 11)]. Compared to previous studies conducted in Saudi Arabia and Yemen, 93.88% of students reported changing their gloves between patients, indicating a somewhat higher usage of protective barriers. [(8).] When airborne infection, molten metal, liquid chemicals, acids, caustic substances, chemical gases or vapors, or potential radiation hazards pose risks to the eye or face, the Occupational Safety and Health Administration (OSHA) standard for eye and face protection requires the provision of protective equipment [(12)].

Regrettably, only 39.57% reported the segregation of sharps from other medical waste, significantly lower than the findings from research in KSA (90%) [(10)], Maryland [(13)], USA (87.9%)[(11)], and Canada (90.9%) [(6).]

V. Conclusion

This descriptive cross-sectional study included a questionnaire and involved 76 dentistry students. The gender composition of participants in the current study consisted of around 87% females and 13% men.

Students practice the standard precautions of infection control in protecting patients, more than 40% said use personal protective equipment when handling blood, body organs, specimens, body fluids, excretions, and secretions, and 78% use hand washing and antisepsis(hand hygiene), and more than 18% try to prevent of needle-stick/ sharp injuries, and more than 53% think environmental cleaning and spills-management, and more than 59% said appropriate handling of the health care wastes/ sharps, and the lowest percentage was about 35.5% Suitable handling of patient care equipment and soiled linen.

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