

Knowledge, Attitude, and Practices Regarding the use of Hazmat Kit among Dental Professionals

Research Article

Rajashri R¹, M.P. Santhosh Kumar^{2*}, K. Murugesan³

¹ Postgraduate Student, Department of Oral and Maxillofacial Surgery, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai 600077, Tamil Nadu, India.

² Professor, Department of Oral and Maxillofacial Surgery, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai 600077, Tamil Nadu, India.

³ Professor and Head of the Department, Department of Oral and Maxillofacial Surgery, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai 600077, Tamil Nadu, India.

Abstract

Background: One of the most challenging aspects of providing medical care is attending to patients who have been contaminated with hazardous materials. HAZMAT is a term used to describe incidents involving hazardous materials or specialized teams who deal with these incidents. Hazardous materials are defined as substances that have the potential to harm a person or the environment upon contact. These can be gases, liquids, or solids and include radioactive and chemical materials. Biological organisms, such as viruses and bacteria, are also included among hazardous materials. Hospitals are required to protect their employees from the exposure of these materials that may occur as a result of patient care.

Objectives: The aim of this study was to evaluate the knowledge and attitudes of healthcare professionals regarding Hazmat kit and its use in healthcare settings.

Methods: A questionnaire comprising the KAP model's constructs, i.e. knowledge and attitude towards the use of Hazmat kit, as well as Hazmat kit practices, was used to collect data. The two constructs, knowledge and attitude, which are the main determinants of the KAP model were found to independently predict health care providers practices of managing hazardous spills. Knowledge of spill management was found to be the strongest predictor. Therefore, it is recommended that the hospitals and universities focus on the knowledge and attitude towards Hazmat kits in order to enhance their practices in hazardous spill management.

Results: 750 members were chosen and were asked to participate in the survey, out of which only 161 responded. The rest denied due to lack of knowledge about it. 67.1% respondents were not aware of the Hazmat Kit and showed a favorable need of more strict policies towards safety for health care providers. They strongly recommended the need of conducting awareness through educational programs and emphasis on training be given to all health care professionals including the doctor, assistant, nurse and house-keeping staffs as well. 82.6% of the population believed that the difficulty in bringing this practice is due to lack of awareness despite other perceptions like the kit is expensive, consumes a lot of time, prefer disposing without kit. Though 94.4% of the population is currently not using Hazmat kits in their practice, 15.5% have positively responded towards its use. The respondent population consisted largely of Dental doctors, undergraduates and post graduates.

Conclusion: It can be concluded from the study that the knowledge and awareness towards the usage of HAZMAT kits is inadequate among dental professionals. Hence, they were lacking regarding the practices of HAZMAT kit in the profession. However, the population showed a positive attitude towards learning through educational programs which gives hope in the better management of HAZMAT incidence. There is a need for hospitals to participate in community disaster planning for HAZMAT incidents. Therefore, it is recommended that the hospitals and universities focus on conducting hazardous spill management programs to enhance the preparedness of management of such events.

Keywords: Hazmat Kit; Accidental Spill Management; Emergency Care; Zone Of Hazard; Knowledge; Attitude; Practices; Dental Professionals.

*Corresponding Author:

Dr. M.P. Santhosh Kumar M.D.S.,

Professor, Department of Oral and Maxillofacial Surgery, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, 162, Poonamallee High Road, Velappanchavadi, Chennai 600077, Tamil Nadu, India.

Tel: 9994892022

E-mail: santhoshsurgeon@gmail.com

Received: July 30, 2021

Accepted: August 11, 2021

Published: September 03, 2021

Citation: Rajashri R, M.P. Santhosh Kumar, K. Murugesan. Knowledge, Attitude, and Practices Regarding the use of Hazmat Kit among Dental Professionals. *Int J Dentistry Oral Sci.* 2021;8(9):4180-4186. doi: <http://dx.doi.org/10.19070/2377-8075-21000853>

Copyright: Dr. M.P. Santhosh Kumar[©]2021. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited.

Introduction

In a hospital, or any other healthcare setting, hazardous substances such as bodily fluids, drugs, cleaning fluids and other chemicals are in very close proximity to hundreds of people each day. Hospital spillages can occur at any time, which can be due to broken or faulty equipment or human error. If this happens, everyone in the area is at risk, from staff to visitors to patients. Some of these people, namely the hospital's patients, may be extremely susceptible to infection, due to illness or recent surgery resulting in an open wound [1]. It may also mean that a department has to close temporarily, which means that vital services may be denied to those that need them. Because a hospital environment necessitates use of hazardous substances, it is vital that contact with them is kept to a minimum, even by those who are used to handling such chemicals [2]. For example, many medical instruments contain mercury, which is a powerful neurotoxin, and some drugs, particularly those used in the treatment of cancer, are cytotoxins, meaning they are toxic to cells [3, 4]. It is essential, therefore, that all hospital departments have the right equipment and well-trained staff on hand to deal with any hazardous spills immediately when they arise [5].

HAZMAT is a term used to describe incidents involving hazardous materials or specialized teams who deal with these incidents [6]. Hazardous materials are defined as substances that have the potential to harm a person or the environment upon contact [7]. These can be gases, liquids, or solids and include radioactive and chemical materials. Biological organisms, such as viruses and bacteria, are also included as hazardous materials. Hospitals are required to protect their employees from the exposure of these materials that may occur as a result of patient care [8]. The aim of the study is to evaluate the knowledge and attitudes of healthcare professionals regarding Hazmat kit and its use in healthcare settings.

Materials and Methods

A cross-sectional study was carried out using a self-prepared questionnaire. The questionnaire was designed to assess the knowledge, attitude and practices [KAP] regarding the use of Hazmat kit in routine dental practice among dental professionals. The healthcare professionals (Dental Doctors, post graduates and housekeeping staff and nurses) working in Thiruvallur and Kanchipuram (Tamil Nadu) during the study period were included. Only those who gave their consent to participate were included in the study.

By employing a convenience sampling method, 750 healthcare professionals were targeted for the study and it was conducted from September 2020 to June 2021. The healthcare professionals (Dental Doctors, post graduates and housekeeping staff and nurses) aged 18 years and above, with English familiarity were included in the study. This study was initiated after approval from the institutional review board. (SDC/SIHEC/2021/0619-0320).

Study Instrument

A self-administered, 19 item questionnaire comprising four sections was used for data collection. The questionnaire acquired the respondent's gender and occupation. In addition to the demo-

graphic data, the data in respect to their knowledge, attitude and practice regarding Hazmat kit usage was collected using a questionnaire containing 13 multiple choice questions and 4 fill in the blanks. Out of the 17 questions, 6 questions were used to assess the knowledge about the Hazmat kit, 7 questions assessed the attitudes of its use and 4 questions on the practices of Hazmat kit in the profession.

I've invited you to fill out a form:

Hazmat Kit: A KAP Survey

Knowledge Attitude and Practices of Hazmat Kit among health care professionals

Gender *

- Female
 Male
 Prefer not to say

Professional Status

- Doctor
 Undergraduate Student
 Post Graduate Student
 Assistant
 House keeping Staff

Are you aware of Hazmat kit? *

- Yes
 No
 Maybe

Expand Hazmat Kit?

What is the purpose of a Hazmat Kit?

Do you think the use of a Hazmat kit is a professional obligation for you? *

- Yes
 No
 Don't know

Who do you think will be the most benefited by the use of Hazmat Kit? *

What are the contents of a Hazmat Kit? *

Is the use of Hazmat kit mandatory in hospitals / clinics? *

- Strongly agree
 Agree to an extent
 Not sure
 Disagree
 Strongly disagree

How likely are you to recommend it's use in hospitals / clinics? *

- Compulsorily
 May be
 Not required

Should there be educational programmes on Hazmat kit? *

- Yes
 No
 Don't know

Who do you think should be given training on Hazmat Kit? *

- Practising Doctor
 Assistant
 Nurse
 House keeping Staff
 All of the above

Do you think there is a need of strict policies towards the safety for health care providers? *

- Yes
 No
 Not sure

Do you think this kit is an effective solution in the safety of health care professionals? *

- Yes
 No
 Maybe

- Are you currently using Hazmat kit in your practice? *
 - Yes
 - No

- Would you use Hazmat kit in your practice? *
 - Definitely Yes
 - No
 - Maybe later
 - Not sure

- What do you think is the difficulty in bringing this practice? *
 - Too cumbersome to use
 - Kit is expensive
 - Consumes a lot of time
 - Prefer disposing without the kit
 - Lack of awareness

- Do you maintain records of needle stick injury in your practice? *
 - Yes
 - No

- Do you maintain the records of incidence of infections and it's rates in your practice? *
 - Yes
 - No

Results

A total of 750 questionnaires were distributed and 161 were received with a response rate of 21.46%. 589 denied participation due to lack of knowledge about the kit. The Kolmogrov-Smirnov test revealed a non-normal distribution of the data. The gender distribution showed female predilection with 102 (63.4%) female respondents. (Fig. 1)

59 (36.6%) were doctors [dental practitioners], 49 (30.4%) were undergraduates (including interns and final year BDS students). 46 (28.6%) were postgraduate students, followed by 5 (3.1%) assistants in clinics and 2 (1.2%) housekeeping staff in hospitals and clinics. (Fig. 2)

Out of the 750 only 161 were willing to participate. 25.5% of the population were aware of the Hazmat kit and 7.5% were partially aware about its use while 67.1% were unaware of it. (Fig. 3)

27.3% of the population agreed that it is a professional obligation and only 13.7% strongly recommend its use(Fig 4). While 22.4% agree to use it but not mandatorily due to lack of severity of infection rates. 62.7% of the population was not sure of its use and 1.3% disagree with the use attributing to lack of awareness. (Fig. 5)

Statistical Analysis

Descriptive statistics were used to illustrate respondents' demographic characteristics. Categorical variables were measured as frequency and percentages, while continuous variables were expressed as mean \pm standard deviation. The Kolmogrov-Smirnov test was applied to declare the nature of data distribution. Data collected was statistically analyzed and results obtained.

Figure 1. Showing gender distribution of the study population.

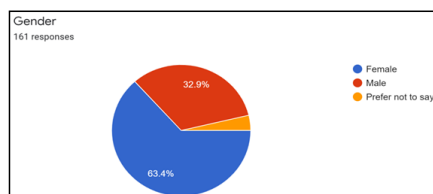


Figure 2. Showing distribution of the study population based on professional status.

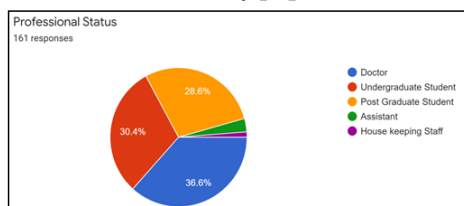


Figure 3. Depicting the awareness of participants regarding HAZMAT kits.

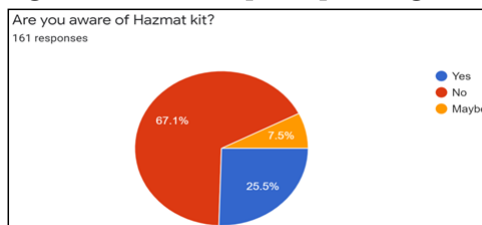
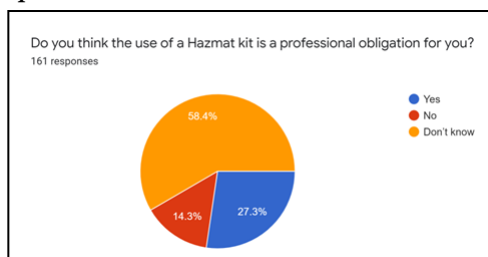


Figure 4. Denotes the distribution of population based on the consideration of HAZMAT kit as a professional obligation.



22.4% participants agreed to mandatory use, only 13.7% are definitely likely to recommend its use in hospitals while the 62.7% is still unsure. (Fig. 5)

Also 67.1% of healthcare professionals want educational programs to be conducted for the use of Hazmat kit (Fig. 6) and 69.6% recommend specialized training to be given to the practicing doctor, assistants, nurse and housekeeping staff. (Fig. 7)

Only 20.5% of the population recommends its use in hospitals and clinics while 76.4% is unsure if it can be recommended to use. (Fig. 8)

70.8% think that there is a need for strict policies towards the safety of health care providers (Fig. 9) and 38.5% of the population is convinced that the kit is an effective solution for the safety of healthcare professionals. (Fig. 10)

94.4% of the population is currently not using the Hazmat kit in their practice (Fig. 11) and only 15.5% are definitive about the use. (Fig. 12)

82.6% of healthcare workers attribute it to non-usage due to lack of awareness. (Fig. 13)

Figure 5. Denotes the distribution of population based on the consideration of mandatory use of HAZMAT kits in hospitals or clinics.

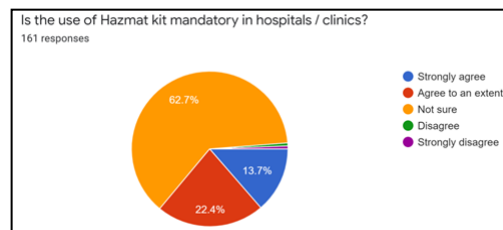


Figure 6. Denotes the distribution of population based on the necessity of conducting educational programs on use of HAZMAT kits in hospitals or clinics.

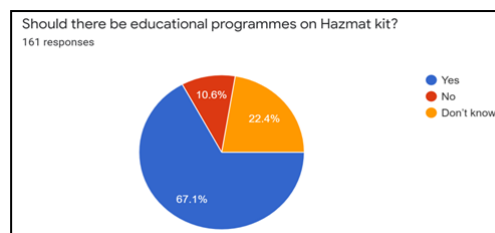


Figure 7. Denotes the distribution of population based on which healthcare professionals should be targeted on use of HAZMAT kits in hospitals or clinics.



Figure 8. Denotes the distribution of population based on recommendation of use of HAZMAT kits in hospitals or clinics.

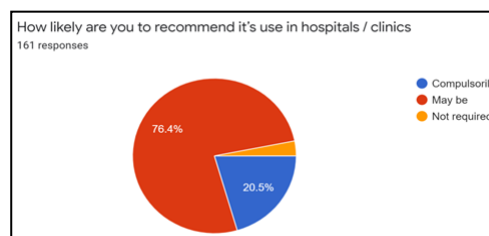


Figure 9. Denotes the distribution of population based on the need for strict policies towards the safety of healthcare professionals.

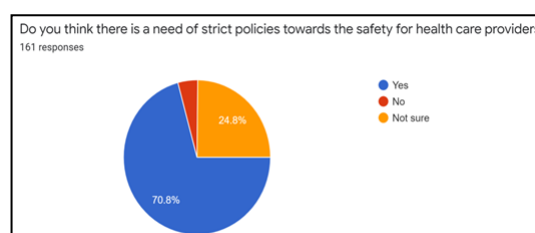


Figure 10. Denotes the distribution of the population based on consideration of HAZMAT kits as effective solutions in safety of healthcare professionals.

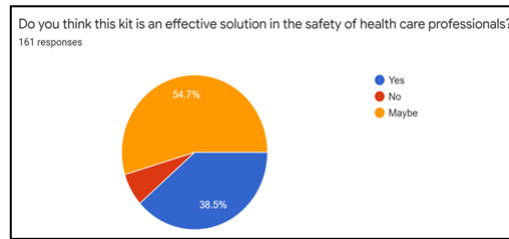


Figure 11. Denotes the distribution of the population which is currently using HAZMAT kits in hospitals or clinics.



Figure 12. Denotes the distribution of population based on whether healthcare professionals would use HAZMAT kits henceforth in hospitals or clinics.



Figure 13. Denotes the difficulties that hinder the use of HAZMAT kits in hospitals or clinics.



Figure 14. Denotes the distribution of population maintaining records of needle stick injuries.

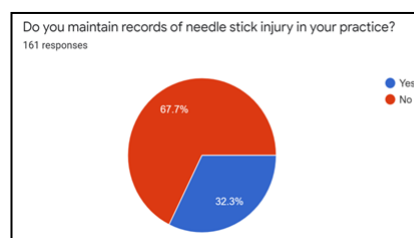
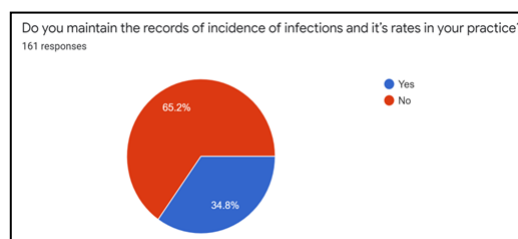


Figure 15. Denotes the distribution of population maintaining records of infection rates in hospitals or clinics.



To assess the usage of Spill kits among 5.7% of the population, records of needle stick injury (Fig. 14) and records of incidence of infection rates were assessed where only 32.3% and 34.8% maintain the records respectively. (Fig. 15)

Discussion

The current study sought to evaluate KAP towards usage of HAZMAT kits. Results of the study revealed poor KAP towards

HAZMAT kits. A small percentage of respondents actually knew about HAZMAT kits and their knowledge was poor among the study cohort. Lack of knowledge about HAZMAT kits can be attributed to the rise in the frequency of infection rates. Only 27.3% of the population believed that it is a professional obligation to use HAZMAT kits, which is again a major sign of concern. The primary source of infection was through needle stick injuries, mishandling of spills and lack of improper treatment before disposal. These results are in line with the findings from previous studies reported around the globe [9-18]. This study is first of its kind and the possible reasons that can be attributed to some differences in response are due to demographic variation of the study population, study location and as well as the study tool used for data collection.

In addition, the mean attitude was also found lower in the study participants. A higher degree of ambiguity was recorded in the attitude where the majority of the healthcare workers are unsure about the significance of HAZMAT kits in order to mandate its use on a daily basis [19]. Most of the participants however reported the need to conduct awareness programs in order to inculcate the need, significance and safety during hazardous spill exposures which is in accordance with previous studies conducted [20-22]. The target population included healthcare professionals at all levels from the doctors to the assistants, nurses and the housekeeping staff. It is imperative to note that there is an urgent need to impose strict policies on the hospitals towards the management of HAZMAT events which result in combating further deterioration of the condition and can prevent spread of infections.

Health Belief Model highlights individual's attitudes and beliefs responsible for particular health behavior. These beliefs and barriers in health care also play a vital role in achieving success. Within this context, poverty, cultural beliefs and perceived severity of illness can be the reasons for multiple opinions and practices towards a certain health behaviour [23-26]. The majority of the participants perceived the HAZMAT kit as costly. It is important that the general population should be educated on all aspects of hazardous spill management rather than on a single or a few issues. It should also be addressed by social and medical researchers for the purpose of achieving a fuller understanding of the underlying issues while the outcome of such studies should be utilized in policy and decision-making by government officials and members of the health care team [27-30].

Participants of the current study showed poor practice towards HAZMAT kit use, recording incidences of needle stick injuries and infection rates. Majority of the participants were not concerned about the safety measures which definitely expose them to the danger of acquiring infection. The positive correlations between knowledge-attitude, knowledge-practice and attitude-practice in this study reaffirm the relationship between knowledge, attitude and practice with HAZMAT kits. It is concluded that adequate knowledge can lead to a positive attitude resulting in good practices.

Hence, there is an urgent need for hospitals to participate in community disaster planning for HAZMAT incidents. Stringent rules have to be imposed on hospitals to protect their employees from hazardous materials exposures, including exposure that may occur as a result of patient care. Patient decontamination ideally should be performed in the field [31]. Adequate personal protec-

tive equipment for healthcare providers in a hot zone includes a chemical-resistant suit, nitrile gloves, disposable boots, and full-face cartridge or supplied air respirator. This equipment is less expensive than most operating suits [32]. With respect to training Healthcare providers, they need education through workshops and drills in the management of hazardous materials. If a hospital is unprepared to handle a contaminated patient, one option is to call the local HAZMAT team. However, this should be worked out in advance and there still needs to be a plan if they are not available [33].

With a rich case bank established in our institution over the last decade, we have been able to conduct research and publish extensively in the KAP survey domain [34-39]. Drawbacks of this study consists of limited population being studied and inclusion of a smaller sample size. Since this study is first of its kind, more similar studies need to be carried out to analyze the population and extract the data regarding its usage. Future scope of the study is that a larger sample from diverse population must be assessed over a longer period of time for planning and implementing protocols for the usage of HAZMAT kits.

Conclusion

It can be concluded from the study that the knowledge and awareness towards the usage of HAZMAT kits is inadequate among dental professionals. Hence, they were lacking regarding the practices of HAZMAT kit in the profession. However, the population showed a positive attitude towards learning through educational programs which gives hope in the better management of HAZMAT incidence. There is a need for hospitals to participate in community disaster planning for HAZMAT incidents. Therefore, it is recommended that the hospitals and universities focus on conducting hazardous spill management programs to enhance the preparedness of management of such events.

References

- [1]. Bowler PG, Duerden BI, Armstrong DG. Wound microbiology and associated approaches to wound management. *ClinMicrobiol Rev.* 2001 Apr 1;14(2):244-69.
- [2]. National Research Council (US) Committee on Prudent Practices in the Laboratory. Prudent Practices in the Laboratory: Handling and Management of Chemical Hazards: Updated Version. Washington (DC): National Academies Press (US); 2011. Pubmed PMID: 21796825./
- [3]. Jabbari B. A Neurotoxin Which is Used for Health-How it all Began?. *Botulinum Toxin Treatment.* 2018: 1-9.
- [4]. Jan AT, Azam M, Siddiqui K, Ali A, Choi I, Haq QM. Heavy Metals and Human Health: Mechanistic Insight into Toxicity and Counter Defense System of Antioxidants. *Int J Mol Sci.* 2015 Dec 10;16(12):29592-630. Pubmed PMID: 26690422.
- [5]. Kohn LT, Corrigan JM, Donaldson MS. Creating safety systems in health care organizations. In *To err is human: building a safer health system.* NAP (US). 2000.
- [6]. Jaramillo S, King KC. Toxic Exposure Hazardous Materials. *StatPearls [Internet].* 2020 Nov 6.
- [7]. Berry L, Perera TB. EMS Hazardous Waste Response. *StatPearls, Treasure Island (FL): StatPearls Publishing.* 2020.
- [8]. Ferronato N, Torretta V. Waste Mismanagement in Developing Countries: A Review of Global Issues. *Int J Environ Res Public Health.* 2019 Mar 24;16(6):1060. Pubmed PMID: 30909625.
- [9]. Elseviers MM, Arias-Guillén M, Gorke A, Arens HJ. Sharps injuries amongst healthcare workers: review of incidence, transmissions and costs. *J Ren Care.* 2014 Sep;40(3):150-6. Pubmed PMID: 24650088.
- [10]. Rapiti E, Prüss-Üstün A, Hutin YJ. Sharps injuries: assessing the burden of disease from sharps injuries to health-care workers at national and local levels. Geneva. 2005.

- [11]. Kebede A, Gerensea H. Prevalence of needle stick injury and its associated factors among nurses working in public hospitals of Dessie town, Northeast Ethiopia, 2016. *BMC Res. Notes.* 2018 Dec;11(1):1-6.
- [12]. Miller CH, Palenik CJ. Infection control and management of hazardous materials for the dental team. Mosby; 2018.
- [13]. Amira CO, Awobusuyi JO. Needle-stick injury among health care workers in hemodialysis units in Nigeria: a multi-center study. *Int J Occup Environ Med.* 2014 Jan;5(1):1-8. Pubmed PMID: 24463795.
- [14]. Motaarefi H, Mahmoudi H, Mohammadi E, Hasanpour-Dehkordi A. Factors Associated with Needlestick Injuries in Health Care Occupations: A Systematic Review. *J ClinDiagn Res.* 2016 Aug;10(8):IE01-IE04. Pubmed PMID: 27656466.
- [15]. Dulon M, Lisiak B, Wendeler D, Nienhaus A. Causes of needlestick injuries in three healthcare settings: analysis of accident notifications registered six months after the implementation of EU Directive 2010/32/EU in Germany. *J. Hosp. Infect.* 2017 Mar 1;95(3):306-11.
- [16]. Francis DL, Wongsin U, Chien SC, Hsu YE, Lohmeyer FM, Jian WS, et al. Assessment of knowledge, attitudes, and practices towards Zika virus among healthcare workers in St. Kitts. *BMC Infect Dis.* 2021 Mar 5;21(1):1-8. Pubmed PMID: 33663410.
- [17]. National Research Council. Prudent practices in the laboratory: Handling and disposal of chemicals. NAP. 1995 Sep 16.
- [18]. Tang CW. Coping in health and illness: the role of traditional and contemporary health beliefs in a Chinese community. HKU Theses Online (HKUTO). 2000.
- [19]. Shaw K. Exploring beliefs and attitudes of personal service practitioners towards infection control education, based on the Health Belief Model. *Environ. Health Rev.* 2016 Mar;59(1):7-16.
- [20]. Norman P. Health locus of control and health behaviour: An investigation into the role of health value and behaviour-specific efficacy beliefs. *Pers. Individ. Differ.* 1995 Feb 1;18(2):213-8.
- [21]. Handel DA, Sklar DP, Hollander JE, Asplin BR, Hedges JR; Institute of Medicine/Association of American Medical Colleges Panelist Group; Society for Academic Emergency Medicine; Association of Academic Chairs in Emergency Medicine Panel. Executive summary: the Institute of Medicine report and the future of academic emergency medicine: the Society for Academic Emergency Medicine and Association of Academic Chairs in Emergency Medicine Panel: Association of American Medical Colleges annual meeting, October 28, 2006. *AcadEmerg Med.* 2007 Mar;14(3):261-7. Pubmed PMID: 17338077.
- [22]. Paul SA, Reddy MC, DeFlitch CJ. A systematic review of simulation studies investigating emergency department overcrowding. *Simulation.* 2010 Aug;86(8-9):559-71.
- [23]. Kilpatrick C, Allegranzi B, Pittet D. WHO First Global Patient Safety Challenge: Clean Care is Safer Care, Contributing to the training of health-care workers around the globe. *Int. J. Infect. Control.* 2011;7(2).
- [24]. Spece RG Jr, Meyer HB. Point and counterpoint. Should HECs be designed primarily to assist the health care team and institution rather than the patient? *HEC Forum.* 1992;4(3):199-203. Pubmed PMID: 10120024.
- [25]. MP SK. Knowledge, Attitude and practices regarding needlestick injuries among dental students. *Asian J Pharm Clin Res.* 2016;9(4):312-5.
- [26]. SK M. Knowledge, attitude, and practices regarding infection control among undergraduate dental students. *Asian J Pharm Clin Res.* 2016;9(1):220-4.
- [27]. Ak H. Knowledge and awareness about oral cancer among undergraduate dental students. *Asian J Pharm Clin Res.* 2016 Jul 1:165-7.
- [28]. Gayathri MM. Knowledge and awareness among patients about dental implants. *J. Pharm. Sci. Res.* 2016 May 1;8(5):351.
- [29]. Vijayalakshmi B, Kumar MS. Knowledge of students about Local anaesthetics used during oral surgical procedures. *J. Pharm. Sci. Res.* 2015 Nov 1;7(11):1011.
- [30]. Gayathri MM. Knowledge, Awareness and Attitude among dental students about hepatitis B infection. *J. Pharm. Sci. Res.* 2016 Mar 1;8(3):168.
- [31]. Ahamed A, Kumar MS. Knowledge, attitude and perceived confidence in handling medical emergencies among dental students. *J. Pharm. Sci. Res.* 2016 Jul 1;8(7):645.
- [32]. Kumar S. Knowledge, attitude and practices of dental students toward dental management of patients on antiplatelet therapy. *Asian J Pharm Clin Res.* 2016;9(30):270-6.
- [33]. Mp SK. Local hemostatic agents in the management of bleeding in oral surgery. *Asian J Pharm Clin Res.* 2016;9(3):35-41.
- [34]. Kumar MP. Newer methods of extraction of teeth. *Int J Pharm Bio Sci.* 2015;6(3):679-85.
- [35]. R Rajashri, M P Santhosh Kumar, KathiravanSelvarasu. Quality of Life in Patients Undergoing Arthrocentesis for Temporomandibular Joint Internal Derangement - A Retrospective Study. *Int J Dentistry Oral Sci.* 2021;8(6):2768-2771.
- [36]. Hemashree J, M.P. Santhosh Kumar, Manjari Chaudhary. Conservative Treatment Modalities in The Management of Temporomandibular Joint Disorders. *Int J Dentistry Oral Sci.* 2021;8(6):2772-2777.
- [37]. Dhakshinya M, M.P. Santhosh Kumar. Knowledge, Attitude and Practices Regarding Temporomandibular Joint Disorders among Dental Students and Practitioners. *Int J Dentistry Oral Sci.* 2021;8(6):2778-2791.
- [38]. Ananya R, M.P. Santhosh Kumar, NashwahHinaz. Effectiveness of Splint Therapy in the Management of Temporomandibular Joint Disorders. *Int J Dentistry Oral Sci.* 2021;8(6):2792-2798.
- [39]. NashwahHinaz, M.P. Santhosh Kumar. Evaluation of Clinical Features in Patients with Temporomandibular Joint Disorders. *Int J Dentistry Oral Sci.* 2021;8(6):2809-2815.