Global Scientific JOURNALS

GSJ: Volume 11, Issue 1, January 2023, Online: ISSN 2320-9186
www.globalscientificjournal.com

TO ASSESS THE KNOWLEDGE AND ATTITUDE OF INFECTION CONTROL AMONG DENTAL ASSISTANTS IN NATIONAL DENTAL HOSPITAL SRI LANKA

R.M.S.S.Rathnayake, K.A.R.P.Jayathilaka

Introduction: Infections in dental settings are transmitted by direct contact with blood, oral or other secretions and indirectly through contact with contaminated instruments and material, surgical equipment or environmental surfaces. Healthcare workers have a crucial role in adhering to effective infection prevention and control (IPC) measures to prevent cross infection in the dental care setting.

Objective: of this study was to assess the knowledge and attitude of infection control among the Dental Assistants in National Dental Hospital, Sri Lanka.

Method: Descriptive cross sectional study was done in period of 3 days. Data was collected using a self-administered questionnaire (SAQ) prepared on different aspects of infection control as sanitation, disinfection and sterilization. Data were mainly presented in percentage frequencies and mean scores. Dental Assistants (DA)who have less than three months of service in the health sector and those who were on leave and transferred to National Institute of Infectious Diseases during the study period were excluded.

Results: Majority 84% (n= 42) were females and only 16% were males. Out of the total respondents 50% (n=25) were belonging to age group of 41- 60 years, 26% were 31-40yerars and other 24% were 18-30 years of age. 52% (n= 26) were educated up to General Certificate of Advance Level, 52% had more than five years, of working experience. In summary, 86% were considered to have good overall knowledge on IPC procedures and practices. The majority 72% (n=36) of respondents were seems to be "**good attitudes**" towards infection prevention and control and 28% (n=14) of respondents had "**poor attitudes**".

Conclusion: Study showed that although the knowledge and attitudes towards Infection prevention and control were good among DAs, the lack of knowledge of the proper disposal of dental care waste needs to be addressed.

Key Words: Dental Assistants, Disinfection, Infection prevention, National Dental Hospital,

Introduction:

Infections in dental settings are transmitted by direct contact with blood, oral or other secretions and indirectly through contact with contaminated instruments and material, surgical equipment or environmental surfaces. Further, organisms may transmit through contact of oral, nasal or conjunctival mucosa with droplets and aerosols generated from an infected person during dental procedures. Adhering to effective infection prevention and control (IPC) measures can prevent cross infection in the dental care setting [1]. Healthcare workers have a crucial role in lowering morbidity and mortality of patients by strictly adhering to correct practices of infection control.

In Sri Lanka Dental Assistants (DA) are trained in the training unit in Institute of oral Health in Maharagama. It is an On-the Job Training (OJT). That is a training given to a paid employee in the public or private sector while he or she is engaged in productive work and that provides knowledge and skills essential to the full and adequate performance on the job.

One of the dental assistant's primary most important roles in a dental practice is infection control, when performing patient's oral procedures by doctors. Their responsibilities include sanitation, disinfection and sterilization.

Sanitation – Kills some bacteria and viruses, less than half in some cases. Solutions are effective but comparatively mild, making them suitable for sensitive and low-risk surfaces. Examples include sanitation of desks, restrooms, doorknobs, office equipment and floors.

Disinfection – Eliminates a higher percentage of potential pathogens. Chemicals are more potent and best used to clean the surfaces and equipment patients touch. Exam chairs, sinks and nearby surfaces are disinfected between visits for safety. Particular attention should be paid to moist surfaces because they're more hospitable to bacterial growth.

Sterilization – Kills or inactivates all pathogens, but the process is harsh, involving high heat or powerful chemicals. Dental assistants sterilize all instruments used in patients' mouths plus linens, fluids and other equipment used during oral surgery.

Dental Assistants main roles are

- Setting up and preparing the surgery before the start of each session.

- Clean and disinfect all equipment and working surfaces to the required standards at the end of each session.
- Keep the clinical areas and all equipment and instruments clean, tidy and sterile as appropriate.

In addition to that, Dental Assistants must establish and maintain friendly, productive working relationships with all members of the dental team.

Objective of this study was to assess the knowledge and attitude of Infection Control among the Dental Assistant in National Dental Hospital

Methodology: Descriptive cross sectional study was done.

Exclusion criteria: DAs who have less than three months of service in the health sector and those who were on leave and transferred to National Institute of Infectious Diseases during the study period.

A self-administered questionnaire (SAQ) was used to collect the data to assess the knowledge and attitudes of DAs on relevant aspects of infection control.

Questionnaire was designed after going through close consultations with the Principal, In charge sister in National Dental Institute of Maharagama. and the Infection control nurse of Dental Hospital. The questionnaire was designed in English and includes multiple-choice questions. The questionnaire was circulated among experts to assure the face validity, content and consensual validity. The questionnaire was then translated into Sinhala. It was not translated into Tamil since there were no Tamil speaking health care assistance among the few remaining HCAs.

The Questionnaire consisted of 4 parts. Part A of the questionnaire included socio demographic details. Part B, C and D included 26 questions to assess their knowledge. Each part having questions relevant to knowledge and procedure of Infection prevention and control.

Part E contained the 5 statements to assess the attitudes of DAs on infection control It was assessed using the Likert scale.
Data were collected in June 16th to 18th of 2021

After obtaining the written consent from the Director of the Dental hospital suitable time to distribute the questionnaire without interrupting the work was decided.

To assure the confidentiality of the person responding, suitable place with no interruption was arranged with the guidance and the permission of the hospital management. Principal investigator (PI) personally handed over the questionnaire with the consent after explaining the purpose of the study.

Data collection was done in the presence of the PI to clarify any queries that might be aroused during the data collection. Before distributing the questionnaire, participants were acknowledged to ensure these responses would be taken anonymously and would not be divulged to a third party. Participants were stressed that their contribution was utmost important to improve the quality of work as well as their future service in infection control. To assure the confidentiality, questionnaires were collected into a sealed box after answering the questionnaire.

Data analysis:

The data were first entered into Statistical Package of Social Science version 21. Data were mainly presented in percentage frequencies and mean scores

Scoring

The scoring method was decided after taking experts opinion. There were 3 sections assessing knowledge, with 26 questions. Those who answered 6 or more questions correctly on that B and C sections were considered as having "**good knowledge"** on those sections, those who answered less than 6 questions correctly were considered as having "**poor knowledge"**. With regard to part D those who answered 4 or more questions correctly were considered as having "**good knowledge"** on that section, those who answered less than 4 questions correctly were considered as having "**poor knowledge"**. To assess overall knowledge, those who answered 16 or more questions correctly for 26 questions were considered as having **"good overall knowledge".** Those answered less than 16 questions correctly were considered as having "**poor overall knowledge".**

Out of 5 attitude statements, 3 were worded negatively. The five-point Likert scale was considered as interval scale and mean value very significant from 1 to 1.8 was considered as "Strongly Disagree", from 1.81 to 2.60 means "Disagree", from 2.61 to 3.40 means "Neutral" from 3.4 to 4.2 means "Agree" and from 4.21 to 5 was considered as "Strongly Agree". Scoring for attitude questions were as follows:

Marks given for positively worded questions:

Strongly agree – 5, Agree -4, Neutral-3, Disagree-2, strongly disagree-1

Marks given for negatively worded questions:

Strongly agree – 1, Agree -2, Neutral-3, Disagree-4, strongly disagree-5

Maximum marks that could be obtained was 25 indicating highest positive attitude. Those who scored above 13 were considered as having good attitude and those who scored 13 or below were considered as having poor attitudes.

Results:

Majority 84% (n= 42) were females and only 16% were males. Out of the total respondents 50% (n=25) were belonging to age group of 41- 60 years, 26% were 31-40yerars and other 24% were 18-30 years of age. More than half of the respondents (52%, n= 26) were educated up to General Certificate of Advance Level, 46% were passed General Certificate of Ordinary Level and 2% were degree or diploma holders. With regard to the working experience, 52%, 46% and 2% had more than five years, 2-5 years and less than one year of working experience respectively.

Table1: Socio demographic characteristics of the respondents (n=50)

Characteristic	Frequency	Percentage (%)
Gender		
Male	8	16%
Female	42	84%
Age at last birthday		
18-30years	12	24%
31-40years	13	26%
41-60years	25	50%
Educational Qualification		
Up to GCE O/L	23	46%
Up to GCE A/L	26	52%
Degree/Diploma	1	2%
Years working at dental Institution		
<2years	1	2%
2-5years	23	46%
>5years	26	52%

Table 2: Knowledge on infection prevention & control procedures (1st set):

Question	Frequency	Percentage
1). Frequency of cleaning chairs, tables, lounges, doors and windows		
a. Daily	**47**	**94%**
b. Once a week	**3**	**6%**
c.Once a month	**0**	**0%**
2).Solution should be used to clean dental chair		
a. Soap & water	**42**	**84%**
b.Sodiun hypochloride	**4**	**8%**
c.70% Alcohol	**4**	**8%**
3). Air & water in handpiece, ultrea sonic scalers & three way syringes should be removed		
a.Withing 30 seconds	**36**	**72%**
b. Withing 40 secounds	**3**	**6%**
c. within 60 secounds	**11**	**22%**
4). Before putting soiled cloths to the laundry		
a. Keep ½ hour in soap water	**8**	**16%**
b. Keep in 0.1%TCL solution	**42**	**84%**
c. Keep in 70% alcohol	**0**	**0%**
5).When making 0.1% TCL solution		
a. First put TCL and then water	**5**	**10%**
b. First put water and then TCL	**45**	**90%**
c. Put water and TCLtogether	**0**	**0%**
6).0.1% TCL solution can keep for		
a. 1 day	**41**	**82%**
b. 2 days	**6**	**12%**
c. 3 days	**3**	**6%**
7). Type of instument that TCL can not be used for		
a. Plastic instruments	**8**	**16%**
b. wood instruments	**10**	**20%**
c. Iron instruments	**32**	**64%**

8). First step should follow when washing uniform contaminated with blood stained		
a. Put in 0.5% hypochlorite solution for 30 minute	**40**	**80%**
b. Put in hot water in 30 minute	**9**	**18%**
c. Put in salted water for 30 minute	**1**	**2%**
9).First item should clean, when cleaning Dental chair		
a. light	**18**	**36%**
b. spittoon	**24**	**48%**
c. Chair	**8**	**16%**
10). Germicide which can be used when Accidentally spilling of blood /other body secretion on to the floor		
a. Freshly made 1% sodium hypochlorite solution	**27**	**54%**
b. 1% hypochlorite solution	**13**	**26%**
c. Savlon mixture	**10**	**20%**

Table 3: Knowledge catergorized on scoring method (1st set of statements)

Range of score	Frequency	Percentage frequency	Interpretation of Knowledge
Score < 6	8	16%	Poor
Score ≥ 6	42	84%	Good
Total	50	100	
Total number of statements =10			

With regard to the 1st set of statements, 84% (n=42) of the participants scored six or more than six and were considered to have good knowledge on IPC practices (Table 3).

Table 2 showed, all most all respondents (≥90 %) were knowledgeable of the daily cleaning of chairs tables and other furniture and procedure for preparation of 0.1% TCL solution. The

majority of respondents had good perception on infection control procedures as sanitization of dental chairs using sopy water (84%), removing of water and air from hand pieces, ultra-sonic scalers and three-way syringes in 30 seconds between patients (72%), Infusion of soiled cloths in 0.1% TCL solution before putting to laundry (84%), intubation of blood-stained uniform in 0.5% hypochlorite solution for 30 second as the first step for disinfection (80%). Regarding the time limit for keeping of prepared 0.1% TCL solution, it was observed that 82% of patticipants were aware that it cannot be kept more than one day.

However, only 54% of respondents were aware about using of freshly made 1% hypochlorite solution as a germicide to clean accidentally spilling of blood or any other body secretion on to the floor, prepared TCL solution can not put in iron instrument (64%) and 52% were unaware about which was the first item should be cleaned when cleaning dental chair(Table 2).

Table 4: Knowledge on IPC categorized on scoring method (2nd & 3rd set of statements)

Range of score	Frequency	Percentage frequency	Interpretation for Knowledge
Score < 6	3	6%	Poor
Score $\geq$ 6	47	94%	Good
Total	50	100	
Total number of statements=10			

With regard to 2nd and 3rd sets of statements, majority 94% (n=47) of the participants scored 6 or more and were considered to have good knowledge on infection prevention practices (Table 4).

Figure 1 showed, all most all 90% of respondents were knowlegable on wearing gloves on both hands and hand washing was needed after handling infected materials, washing eyes with running water for accidentally spilling of infected or chemical materials in to eyes and accidental cut or needle prick injury should be washed with soap and water. Also 62% of respondents were aware about the adjusting the glove in one hand by using the other bare hand was incorrect.

Figure 1 -Frequency distribution of knowlegde on IPC (2nd set of statements)

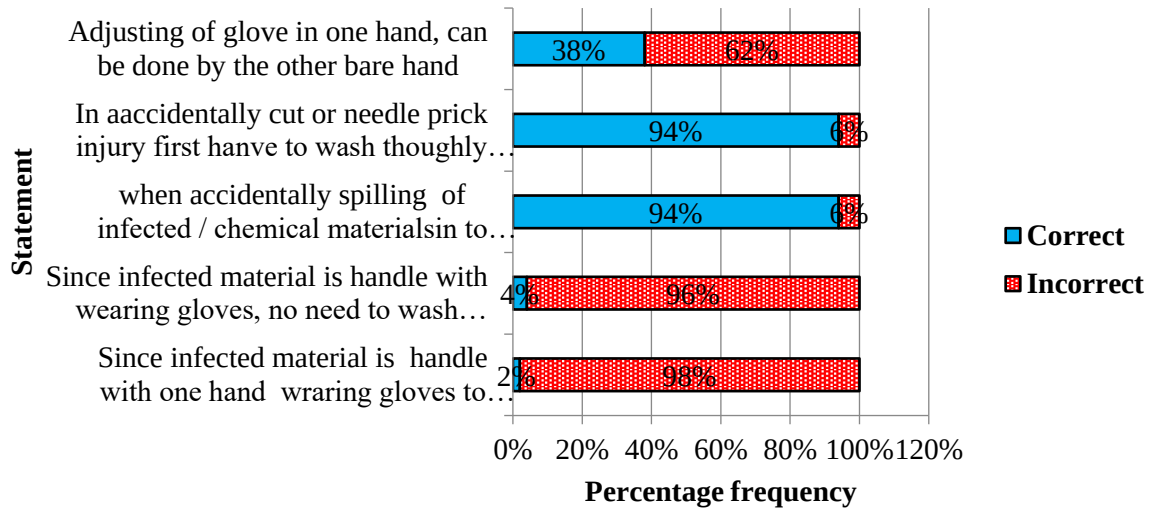

Figure 2 -Frequency distribution of knowlegde on IPC (3rd set of statements)

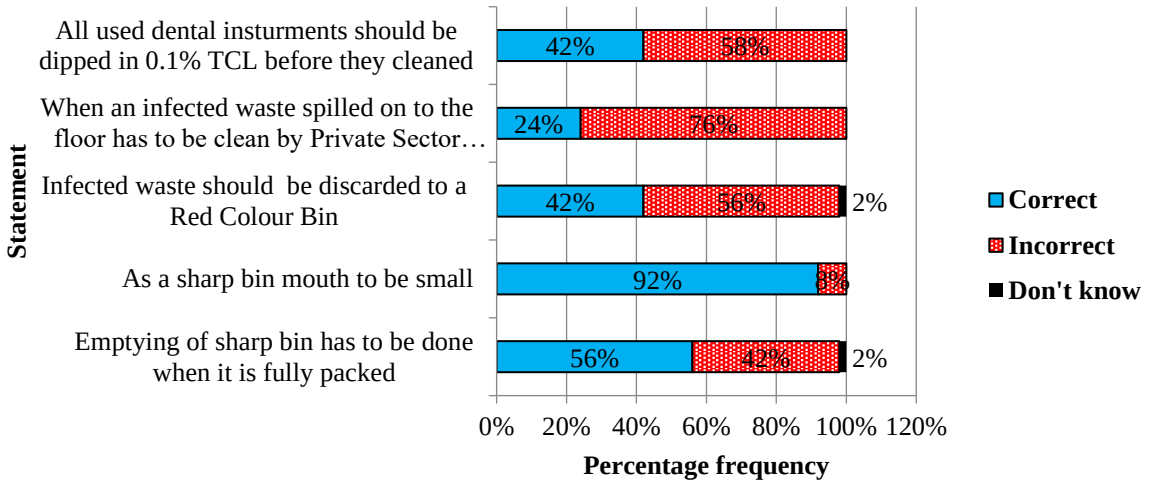

Figure 2 showed, only 42% of correct responses were obtained for emptying of sharp bin. However, all most all (92%) of respondents were aware about the sharp bin mouth has to be small as sufficient only to dispose the used sharps. Also majority 56%, 76% and 58% of respondents were aware about the incorrect statements of "infectious waste discarded in to a Red Colour Bin", "If Infected waste spilled on to the floor, has to be leave unattended until

cleaned by Private Sector cleaning Staff with germicide" and "all used dental instruments dipped in 0.1% TCL before they cleaned" respectively.

The poor adherent to the infection control practices were observed as emptying of sharp bin should be done when it is fully packed marked as correct by the majority (56%) of respondents. Nearly half of the respondents (42%) did not follow the National colour coding system and infectious waste discarded in to a Red Colour Bin and all used dental instruments dipped in 0.1% TCL before they cleaned (42%) has been taken as correct answers. Also 2% of the respondents did not have any idea about the colour of the waste bin and emptying of sharp bin.

Table 3: Knowledge on IPC categorized on scoring method (4th set of statements)

Range of score	Frequency	Percentage frequency of respondent	Knowledge interpretation
Score <4	9	18%	Poor
Score ≥ 4	41	82%	Good
Total	50	100	
Total number of statements = 6			

With regard to the 4th set of statements, 82% (n=41) of the participants scored six or more than six and were considered to have good knowledge on IPC practices (Table 3)

Figure 3 showed, all most all (96%) participants had good knowledge on wearing heavy duty gloves or double gloves and 86% were adhered with practicing of categorization of medical waste and washing hands with soap and water before going out from the clinic respectively. Also, majority 62% and 78% were aware about cleaning of spittoon basin at the end of the clinic and discarded Mercury and Amalgams dispose with normal waste were incorrect practices. 64% were stated that sterilization chart was maintaining in their clinic.

However, the poor knowledge on practices of infection prevention were observed as 14% of respondents were not adhered with practice of hand washing before going out from the clinic, 22% were disposed discarded Mercury and Amalgams with normal waste, 38% were felt that cleaning of spittoon basin at the end of the clinic was adequate to prevent spread of infection and 36% were stated that sterilization chart was not maintained.

Figure 3- Frequency distribution of knowledge on IPC (4th set of statements)

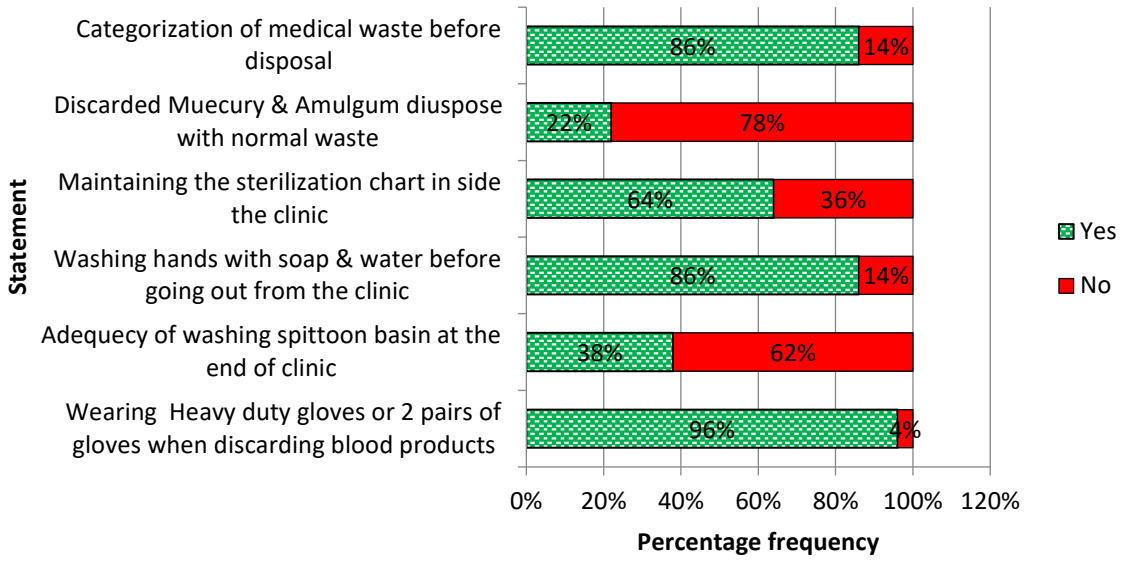

Table 5: Overall knowledge on IPC procedures:

Range of score	Frequency of respondents	Percentage frequency of respondent	Interpretation of knowledge level
Score <16	7	14%	"Poor overall knowledge"
Score ≥ 16	43	86%	"Good Overall knowledge"
Total	50	100	
Total number of statements = 26			

In summary, more than three quarter of dental care assistants (86%) scored sixteen or more than sixteen and were considered to have good overall knowledge on IPC procedures and practices.

Table 6: Attitudes towards infection prevention and control activities:

Score	Likert scale	Responses	Percentage frequency of respondents	Interpretation
5	4.21-5.00	Strongly Agree	0% (0)	**"Highest positive attitudes"**
4	3.41- 4.20	Agree	2% (1)	**"Good attitudes"**
3	2.61- 3.40	Neutral	70% (35)	
2	1.81- 2.60	Disagree	16% (8)	**"Poor attitudes"**
1	1.00-1.80	Strongly Disagree	12% (6)	

The 5-point Likert scale was considered as interval scale for interpretation of resulted mean values. Sum the value of each selected response and created the score for each respondent. The "highest positive attitudes" was not resulted due to no one was obtained maximum of 25 marks. The majority 72% (n=36) of respondents were seems to be "**good attitudes**" towards infection prevention and control and 28% (n=14) of respondents had "**poor attitudes**".

Discussion:

The Institute of oral Health, as a center of training which implies students learns the nuances of patient care and other related activities. This is also the time when knowledge and skills are acquired, and it is imperative that they are trained in every aspect of dental care like Infection prevention and control.

Overall, the present study demonstrates a good knowledge score and a positive attitude of dental care assistance towards infection prevention procedures in dentistry. Of the study participants, more than three quarter of dental care assistants (86%, n=43) had "good overall knowledge" on infection prevention. Therefore, they had better understand about purpose of and requirements within each area of the dental care setting and adhere to protocol. Majority 52**%** had more than five years of experience in sanitation, disinfection and sterilization procedures and protocol practicing under dental care setting. However, study done by Warnakulasooriya P H and Arnold M. indicated that the level of knowledge did not have a significant association with factors; age, academic qualification, or profession of the Health Care Workers [9].

Even though DAs had good knowledge and positive attitude towards IPC their practices were inadequate with regard to some of the preventive measures. Inadequate infection control

measures can result in serious infections such as HIV and hepatitis [3]. Healthcare waste management is an integral part of an infection prevention and control program in a hospital and researches showed that all disposables should be considered highly infected medical waste and discarded appropriately [1, 3, and 4].

The result of the present study showed, waste categorization was not practiced properly by 14% of respondents, nearly one fifth of the DAs were disposed Mercury and Amalgam with normal waste and 42% not followed proper protocol for color coding system. Further, about more than half of the respondents (58%) unaware or practicing improper method for the emptying of sharp bin. In dental setting proper disposal of waste sharp is particularly essential to prevent needle stick injuries and acquiring infections [3]. Also, disposables should be considered highly infected medical waste and discarded appropriately [4]. Therefore, this ineffective healthcare waste management leads to a significant health risk to the public, patients and hospital staff [9]. Hence lack of knowledge of the proper disposal of dental care waste is concern and that needs to be addressed. Khubchandani K et al. (2020) also indicated that many other studies showed improper disposal of such waste [3].

As a part of the infection prevention plan, routine cleaning and disinfection of environmental surfaces remove large numbers of microorganisms from surfaces [9]. Present study showed, DAs had good knowledge on this regard. The poor knowledge was resulted regarding the cleaning of spittoon basin.

Hand washing is considered to be the most effective measure in hospital infection control. Study showed dental care assistants maintained high standards of hand care practices. The incorrect practice of adjusting glove in one hand by using other bare hand was actually practicing by only one fourth of the respondents.

In practice 64% of respondents stated that the sterilization chart was maintained inside the clinic. The sterilization chart helps as a summary guide to carry out the infection control procedures and protocols, helps to identify the laps in infection control and perform correct practices. Further all steralizable instruments must be timely cleaned, disinfected and sterilized [2, 4]. The study done in University Dental Hospital; Peradeniya (2018) was indicated that awareness of sterilization of dental instruments was poor among dental health care workers (5). Therefore, maintaining of sterilization chart inside the clinic as a guideline which implies the importance of such activities to DAs to carry out actual practice properly.

Conclusion and recommendation:

Study showed that although the knowledge and attitude toward Infection prevention and control was good among DAs. The lack of knowledge of the proper disposal of dental care waste is concern and that needs to be addressed. The educational programs need to be conduct to improve the knowledge and practices of DAs.

References:

1. Al-Johani K. A., Alharbi H. M., Alotaibi M. S., et al. Perception of dentists and patients about infection prevention and control in dental clinics: a review IJMDC. 2021; 5(2)
2. Hospital Infection Prevention and Control Manual. 2021. Sri Lanka College of Microbiologists
3. Khubchandani K, Devi K M, GunasekaranS, Yeturu S.K., Ramanarayanan V. Knowledge, attitude, and practices of biomedical waste management among clinical dental students. Journal of Global Oral Health July-December 2020; Volume 3: Issue2
4. Kochhar A.S., Bhasin R., Kochhar G.K., Dadlani H., Thakkar B., Singh G. Dentistry during and after COVID-19 Pandemic: Pediatric Considerations International Journal of Clinical Pediatric Dentistry, July–August 2020; 13(4):399-405
5. Manchanda K. Knowledge, attitude, and practices about biomedical waste management among dental healthcare personnel in dental colleges in Himachal Pradesh: A cross-sectional study. SRM J Res Dent Sci 2015; 6:166-9.
6. Ratnayake D., Medawela S., Jayasinghe R., De Silva D., Sitheeque M. Awareness of risk of cross-infection and infection-control measures among patients attending University Dental Hospital, Peradeniya, Sri Lanka. Journal of Investigative & Clinical Dentistry. February 2018; 9(1)
7. Warnakulasooriya A. H., Arnold M., Managing COVID-19 pandemic; Knowledge and practices of Community Healthcare Workers in Sri Lank. International Journal of Scientific and Research Publications, June 2022;11(6)
8. Thribhuvanan L., Saravanakumar M. S., Rohini K. Post-COVID-19 clinical setup in pediatric dentistry. Journal of Global Oral Health. 2022; 5(1):49-53
9. Saveanu C. I., Meslec M. D., Saveanu A. E, et al. Knowledge Level on Infection Control among Romanian Undergraduate and Postgraduate Dental Students. Medicina 2022, 58(5)661