

Full Length Research Paper

Current aptitude on management of medically compromised patients: A questionnaire based survey of medical, dental and nursing students

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Advances in medical technology, greater access to medical facilities and better socio-economic conditions had increased the life expectancy. The proportionate increase of the elderly in the population caused a gradual escalation of the number of medically compromised patients. Knowledge, awareness and practices of health personnel hold paramount importance in the proper management of these patients to prevent complications. Thorough literature search did not generate relevant data with respect to aptitude of medical, dental and nursing personnel or trainees in this arena. Hence, the present study was planned to evaluate and compare the knowledge and awareness of medical, dental and nursing students in the management of medically compromised patients through a questionnaire. This cross sectional study was conducted in medical, dental and nursing colleges of the campus and the surrounding regions. A closed ended questionnaire containing 20 multiple choice questions with four options each, pertaining to disorders and management of the commonly encountered systemic conditions was circulated among medical, dental and nursing students. The responses of 750 students were tabulated, maintaining anonymity and statistical analysis was done. Total mean scores of medical and dental students were around 50%, while the nursing students had an average score of 30%. The medical students fared better in medical emergencies and HIV than dental and nursing students, while the medical and dental students had comparable knowledge regarding cyclic vomiting syndrome (CVS) and other systemic disorders. There was a lacuna existing in the knowledge of medical, dental and nursing students regarding the management of medically compromised patients.

Key words: Awareness, dental students, medically compromised patients, medical students, nursing students, questionnaire.

INTRODUCTION

Advances in medical technology, greater access to medical facilities and better socio-economic conditions had increased the life expectancy of humans across the

globe (Dhanuthai et al., 2009). The proportionate increase of the elderly in the population caused a gradual escalation of the number of medically compromised

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patients (MCP). Medically compromised patients are patients with medical diagnoses that frequently require modification of dental treatment according to their systemic condition (Dhanuthai et al., 2009; Anitha et al., 2013). Dhanuthai et al. (2009) reported that around 12.1% of the subjects attending a dental hospital in Bangkok, were medically compromised, with cardiovascular disorders, endocrine disorders, respiratory diseases, hematological disorders, liver diseases and renal diseases in decreasing order of frequency (Dhanuthai et al., 2009). Anitha et al. (2013) however reported a much lesser prevalence of 4.14% of MCP in a South Indian Dental College, over a period of 3 years. They had reported that majority of them had cardiovascular ailments, diabetes, followed by meager percentage of respiratory ailments and thyroid disorders (Anitha et al., 2013).

The mouth is an integral part of the body and there are oral manifestations of many systemic diseases that must be managed in medically compromised people. It is possible, that MCP have frequent oral and dental problems apart from medical complaints, for which they present to various health care workers (HCW), including dental surgeons. Medically compromised patients require careful diagnosis and treatment of their oral complaints, which may be related to the underlying disease process or medications being taken and their management may require a modification of the routine treatment plan (Silvestre et al., 2014). Planning for dental treatment in the medically compromised patients primarily involves the understanding of the nature of the patient's disease and its impact on their physiology, response to treatment and post treatment healing (Shah et al., 2013).

It is also a common practice in rural settings that patients present to the nearest available health worker, irrespective of the complaint or the academic qualification of the HCW being consulted. Thus a basic knowledge of life threatening medical conditions is a necessary requisite for all HCW, irrespective of their profession. The identification, diagnosis and appropriate treatment planning is hence not possible for health care workers without a basic knowledge and training about these medical conditions.

Physicians, dentists and nurses make up the bulk of healthcare workers. Knowledge, attitude and behavior of the students of these professions about medically compromised patients are imperative as they will be bound to take care of these patients in the future. Are these students, then, being trained adequately to manage emergencies and acquire the basic knowledge sufficient enough to treat such patients? Despite the importance, thorough literature search revealed no studies reporting the knowledge, attitude and practice of health care professional students on medically compromised conditions. Hence, the present study was undertaken to assess the current aptitude of the medical, dental and

nursing students of the campus and the neighboring colleges to assess their overall perspective through a questionnaire survey, when it comes to managing medically compromised patients.

MATERIALS AND METHODS

Study population and design

This cross sectional study was conducted in final year and interns of medical, dental and nursing colleges of the campus and the surrounding regions. The inclusion of participants is as shown in Figure 1. Prior approval from the ethical committee and the concerning authorities was obtained for the smooth conduct of the study.

Data collection

A closed ended structured questionnaire was formulated by the authors (as standardized questionnaires were not available on this topic), keeping in mind the commonly presenting medically compromised conditions, with emphasis on cardiovascular, endocrine, medical, dental emergencies and Human Immunodeficiency Syndrome (HIV) (Figure 2). The questionnaire containing 20 multiple choice questions with four options each, pertaining to the disorders and management of the commonly encountered systemic conditions was circulated amongst medical, dental and nursing students (final year and interns). They were asked to fill the responses within 20 min. The students were asked to compulsorily answer all questions, so as to judge the true knowledge and negate any bias. After the collection of the questionnaires, the correct answers were announced in the class rooms as an attempt to educate them.

The responses were collected only from the students present on the date of collection. Incomplete responses were discarded from analysis. The questions were also grouped under 5 headings after the responses were collected: cardiovascular system, other systemic diseases, HIV, dental and medical emergencies to permit adequate and easy comparison of knowledge between the systems. The reliability of the questionnaire was analyzed using Cronbach's alpha which was found to be acceptable (0.84). The data was thoroughly checked and errors were corrected before the data analysis. Data was then tabulated, maintaining anonymity and statistical analysis of the responses was done using SPSS software version 20.0. Descriptive statistics were obtained and mean percentage scores, standard deviation, frequency distribution were calculated for the knowledge of the three groups. Analysis of variance (ANOVA) test was applied for the statistical evaluation of means.

RESULTS

The mean scores and the range of correct responses of the three groups, medical, dental and nursing students are tabulated as shown in Table 1. Medical and dental students scored only 50% on an average. However, they performed significantly better than the nursing students ($p < 0.001$) (Table 1). The average performance of all the professional students was poor, with only 8.4 questions out of 20 being answered correctly.

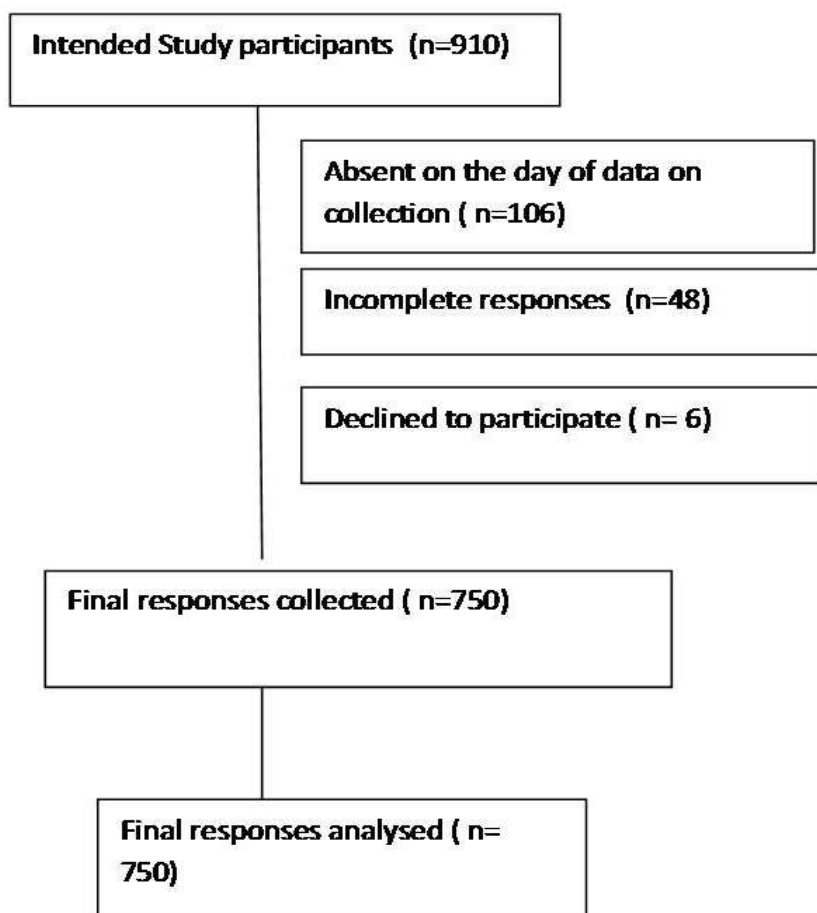


Figure 1. Flow chart of the survey.

The responses of the students of various groups for each question are shown in Table 2. Question 17, followed by 10 and 6 recorded less correct responses in all the three groups, while question number 16 recorded the maximum correct responses. The overall performance regarding red ribbon sign of HIV (question 16) was the best with correct responses from 80, 91 and 81% of medical, dental and nursing students, respectively. However, awareness regarding transmission of HIV from a well known patient of HIV through needle stick injury (question 17) was poor among all groups. Only 10% of the medical students, 16% of dental students and 3% of nursing students knew that the risk of transmission of HIV amounts to only 0.3%. When questioned about the willingness of the students to live with HIV/AIDS patients (question 19), only 59% of medical, 54% of both dental and nursing students were willing. Twenty one percent of medical, 10% of each dental and nursing students were reluctant to live with HIV/AIDS patients.

While the performance of the three groups was compared between the systems (Figure 3 and Tables 3

to 7), the medical and dental students performed well with CVS and other systemic disorders while, knowledge of the nursing students was inferior. Medical students fared far better than dental and nursing students with regard to medical emergencies and HIV.

Knowledge regarding dental emergencies was the highest in the dental group, followed by medical students and nursing students. Only 25 and 27% of the medical and nursing students, respectively knew that the best medium for storage of an avulsed tooth was saliva (Figure 4).

DISCUSSION

Practice of modern medicine has become a joint effort of many groups of health care workers, both medical and paramedical. Various health professionals working together constitute the health team to provide medical care for the patient and the society at large (Silvestre et al., 2014). Consequently, a basic knowledge of life threatening medical conditions is a necessary requisite

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1. General Standard prophylaxis for infective endocarditis:
2. In case of penicillin Allergy, which is the drug of choice in infective endocarditis
3. In case of an hypertensive patient, if the blood pressure is >200/100mm of Hg, then which of the following is preferred –
4. In patients on anti coagulants, INR ratio should be _____ to perform surgical procedures.
5. Within what interval should a patient with an attack of angina pectoris be referred for medical care, if there is no recovery despite the use of 2-3 sublingual nitroglycerine tablets.
6. For patients on anticoagulant therapy, with an abnormal INR, anticoagulants should be stopped minimum for what time before the surgical procedure
7. General anesthesia is contraindicated in patients with
8. If a patient has epileptic seizures in a dental clinic, treatment of choice is
9. Maximum recommended dose of lidocaine with vasoconstrictor
10. Maximum recommended dose of lidocaine without vasoconstrictor is
11. While performing CPR, pressure should be applied to depress the sternum to what depth in adults
12. Hematoma /ecchymosis is best treated by
13. Best medium for storage of avulsed tooth is
14. Various signs in a diabetic patient that enables physician to recognize hypoglycemia
15. If a patient has an acute anaphylactic reaction, the drug of choice is
16. Internationally recognized red ribbon symbol represents which of the following disease
17. From a well-known HIV patients, risk of HIV due to needle stick injury is
18. Protocol for post exposure prophylaxis is
19. Regarding HIV/AIDS patients, are/do you
20. Absolute contraindications of vasoconstrictor in dentistry is

Figure 2. Questionnaire used for the study.

Table 1. Mean scores of the groups.

Group	Mean score	SD	Range
Medical	10.03	2.28	5-16
Dental	9.66	2.94	3-18
Nursing	5.66	1.85	2-11
Total	8.45	3.11	2-18

for all HCW, irrespective of their profession. Since there was paucity in literature, the present study was conducted to assess the current aptitude of medical, dental and nursing students on medically compromised

patients.

In the present study, the mean scores of medical and dental students was around 50%, while that of nursing students was inferior. Inefficient aptitude was obvious among the three groups. It was thus shown that deficiency exists in the knowledge of medically compromised patients among the students. The cause for this deficiency could be due to inefficiency of training protocols, syllabus included or practical training currently being imparted. Inadequate knowledge might lead to a decrease in proficiency in the corresponding arenas and might even lead to harmful consequences. In rural settings, most often, the critically ill patients are brought to primary health care centers from far off distances.

Table 2. Comparison of mean scores among the groups.

Group	Group compared	Mean difference	Standard error	Significance
Medical	Dental	0.37	0.21	0.217
	Nursing	4.37	0.21	0.000
Dental	Medical	-0.37	0.21	0.217
	Nursing	4.00	0.21	0.000
Nursing	Medical	-4.37	0.21	0.000
	Dental	-4.00	0.21	0.000

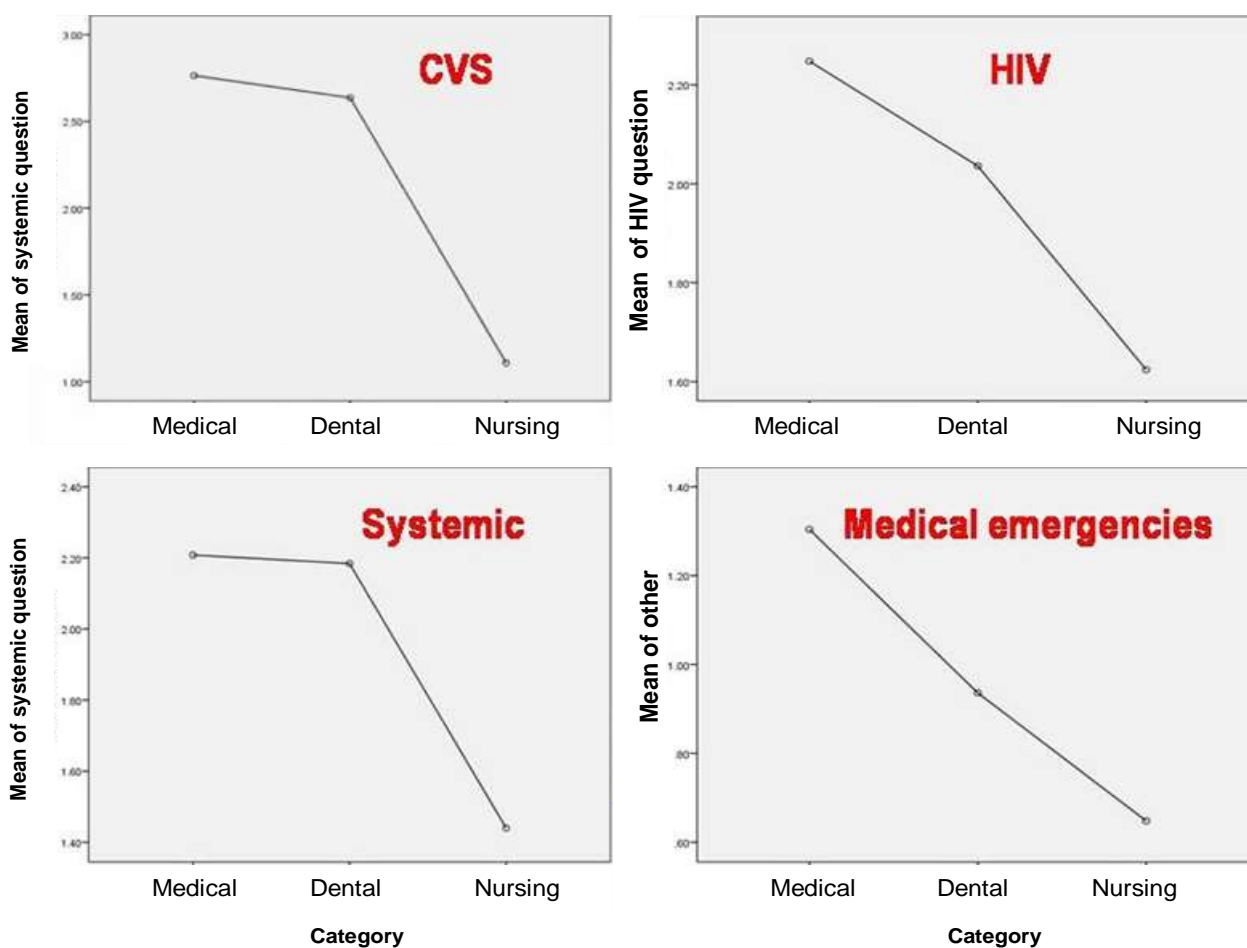


Figure 3. Comparison of various systems among the groups.

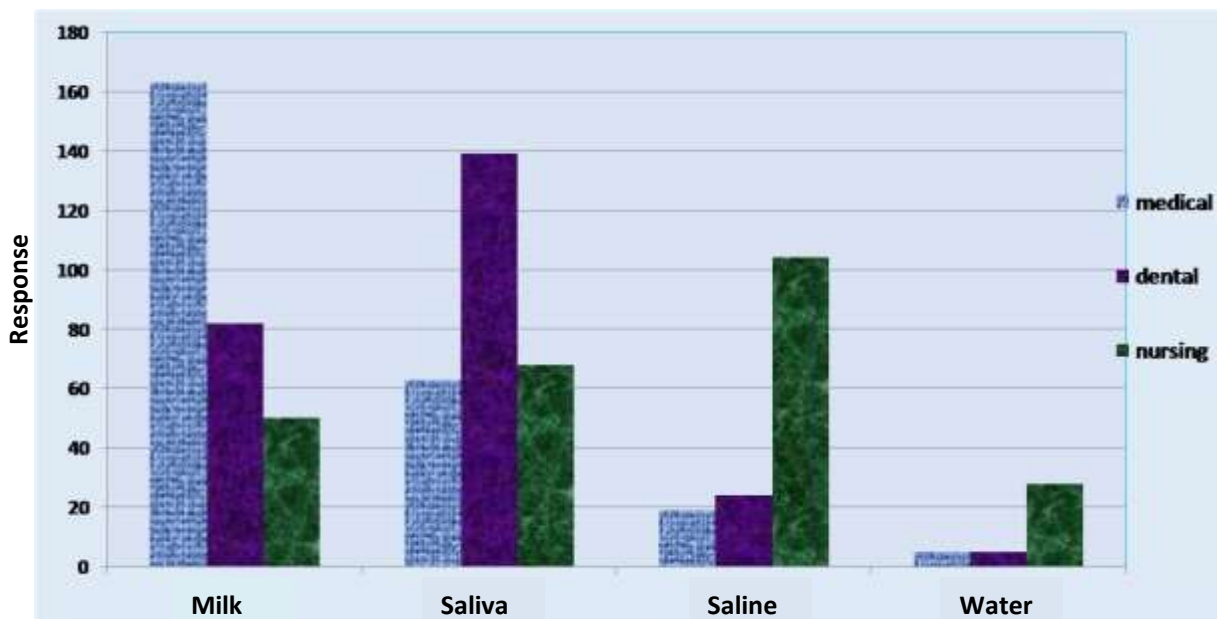
Lack of awareness of the possibility of transmission of HIV through needle stick injury in all the three groups in the present study, may instill a fear of contraction of HIV infection and a possible reluctance in treating them. Furthermore, reluctance to live with HIV patients was present in all the medical, dental and nursing groups. Insufficient knowledge might cause negative attitude of where only nursing staff are present. In this context, it is

important that nursing personnel are adequately trained to handle such critical situations.

HCW towards HIV-positive patients. The link between increased knowledge of the disease and improved attitudes towards HIV/AIDS patients has been documented (Aggarwal et al., 2012). Our findings were in contrast with observations made by Aggarwal et al. (2012), who reported that 95% of the dental and nursing

Table 3. Question wise correct responses recorded in the three groups.

Question No	Medical		Dental		Nursing	
	n	%	N	%	n	%
1	153	61.2	131	52.4	60	24
2	100	40	117	46.8	60	24
3	106	42.4	110	44	34	13.6
4	171	68.4	129	51.6	75	30
5	162	64.8	163	65.2	83	33.2
6	60	24	91	36.4	24	9.6
7	117	46.8	65	26	97	38.8
8	159	63.6	133	53.2	54	21.6
9	85	34.0	150	60	52	20.8
10	62	24.8	60	24	30	12
11	204	81.6	142	56.8	67	26.8
12	168	67.2	118	47.2	60	24
13	63	25	139	55.5	68	27.2
14	183	73.2	128	51.2	110	44
15	122	48.6	92	36.8	95	38
16	198	79.2	227	90.8	202	80.8
17	22	8.8	41	16.4	7	2.8
18	194	77.6	105	42	61	24.4
19	148	59.2	136	54.4	136	54.4
20	170	68	138	55.2	40	16

**Figure 4.** Responses of the study participants of all groups to best medium for storage of avulsed tooth.

students in their study had no change in attitude for HIV/AIDS patients (Aggarwal et al., 2012). However, the results were similar regarding the transmission of HIV through needle stick injury. They also reported moderate

to excellent overall awareness of dental and nursing students in their study in contrast to our finding. The variation in the awareness could be due to the differences in the study topics evaluated as our study

Table 4. Responses of all study groups to Group 1 questions: CVS.

Question	Options	Responses		
		Medical	Dental	Nursing
General standard prophylaxis for infective endocarditis	Amoxicillin adult 2 g , Child 50 mg/kg	153	131	60
	Amoxicillin adult 6 g, Child 100 mg/kg	48	55	59
	Amoxicillin adult 8 g, Child 10mg/kg	28	47	63
	Amoxicillin adult 10 g, Child 70 mg/kg	21	17	68
In case of penicillin allergy, which is the drug of choice in infective endocarditis	Clindamycin adult 600 mg, Child 20 mg/kg	26	32	66
	Cephalexin adult 2 g, Child 50 mg/kg	67	38	56
	Azithromycin adult 500 mg, Child 15 mg/kg	57	63	68
	All of the above	100	117	60
In case of an hypertensive patient, if the blood pressure is 200/100 mmHg, then which of the following is preferred	No dental treatment	37	95	99
	Limited dental treatment	106	110	34
	Elective dental treatment	81	37	24
	Any treatment that is required can be given	26	8	93
Within what interval should a patient patient with an attack of angina pectoris be referred for medical care, if there is no recovery despite the use of 2-3 sublingual nitroglycerine tablets	Within 15 min	43	57	107
	Within 30 min	162	163	83
	Within 1 h	8	25	25
	Referral not required	7	5	35
Absolute contraindications of vasoconstrictor in dentistry is	Hypertension, diabetes, drug abusers	33	23	103
	Uncontrolled hypertension, myocardial infarction, TCA therapy	170	138	40
	Uncontrolled diabetes, myocardial infarction, TCA therapy	36	30	54
	Hypertension, diabetes, drug abusers, myocardial infarction	11	59	53

diversified on medically compromised patients while their study focused only on HIV/AIDS.

The knowledge of medical and dental students, though comparable in CVS and systemic disorders, medical students fared better than dental students in medical emergencies and HIV. The overall performance of nursing students was comparatively mediocre in all the systems. Though this could be partly explained by the

curriculum in the respective courses; further training intended to improvise the current scenario is recommended.

Traditionally, physician training in oral health has been limited. Even though they are qualified in the medical field, their knowledge about dental diseases, relationship of oral health with systemic diseases and life threatening dental diseases is scarce (Baseer et al., 2012; Srinidhi et al., 2011).

Medical practitioners should also possess basic dental knowledge to uncover signs and symptoms of dental diseases from patients, to provide appropriate treatment or advice to these patients and to act as public health educators (Patil et al., 2010). Due to the problems of access to dental care, patients may turn to other primary health care providers for their oral health needs sometimes resulting in medical practitioners

Table 5. Responses of all the study groups to Group 2: Other systems.

Question	Options	Responses		
		Medical	Dental	Nursing
In patients on anticoagulants, INR ratio should be to perform surgical procedures	3.0-4.5	16	23	33
	0.5-4.0	37	48	86
	1.0-5.0	26	50	56
	2.0-3.5	171	129	75
For patients on anticoagulant therapy, with an abnormal INR, anticoagulants should be stopped minimum for what time before the surgical procedure	24 h	69	29	179
	48 h	113	80	38
	72 h	60	91	24
	1 week	8	50	9
General anesthesia is contraindicated in patients with	Anemia	117	65	97
	Hypertension	33	115	72
	Hyperthyroidism	99	47	77
	Diabetes	1	23	4
If a patient has epileptic seizures in a dental clinic, treatment of choice is	Diazepam 10 mg, 5 mg/min , repeated every 10 min	159	133	54
	Diazepam 20 mg repeated every 5 min	62	31	56
	Diazepam 10 mg, repeated every 20 min	27	56	127
	Diazepam 20 mg, repeated every 10 min	2	30	13
Various signs in a diabetic patient that enables physician to recognize hypoglycemia	Cold and wet skin	183	128	110
	Hot and dry skin	45	30	52
	Syncope	19	63	35
	None of the above	3	29	53

encountering patients present with oral and dental problems. In the present study, the knowledge regarding dental emergencies was the highest among dental students as expected; however, there is again a need to improvise the knowledge of medical and nursing students in this field, as they might be the first health care personnel attending a critically injured/sick patient.

Appropriate knowledge of these HCW would guide the patient correctly and minimize the undesirable consequences.

The corrective steps that may improve awareness include modification of the existing curriculum with more emphasis on practical training in the management of medically compromised patients, conduction of continuing

medical/dental education programmes or workshops at periodic intervals. Attending such professional meeting at regular intervals boosts the confidence and knowledge of the students and helps them in handling such patients better.

The strengths of the study include large sample size and the diverse nature of questions incorporated. The limitations include the lack of

Table 6. Responses of all study groups to Group 3 questions: Medical and dental emergencies.

Question	Options	Responses		
		Medical	Dental	Nursing
Maximum recommended dose of lidocaine with vasoconstrictor	10 mg/kg	37	50	60
	7 mg/kg	85	150	52
	70 mg/kg	79	7	100
	20 mg/kg	49	43	38
Maximum recommended dose of lidocaine without vasoconstrictor is	300 mg	62	60	30
	200 mg	107	70	59
	100 mg	55	97	128
	500 mg	26	23	33
While performing CPR, pressure should be applied to depress the sternum to what depth in adults	3-4 cm	21	58	61
	4-5 cm	204	142	67
	1-2 cm	10	42	100
	5-6 cm	15	8	22
Hematoma/ecchymosis is best treated by	Intermittent ice packs for 1st 24 h following intermittent hot moist packs	168	118	60
	Intermittent hot moist packs for 1st 24 h following intermittent ice packs	65	43	39
	Only ice packs for 48 h	14	76	105
	Only hot moist packs for 48 h	3	13	46
Best medium for storage of avulsed tooth is	Milk	163	82	50
	Saliva	63	139	68
	Saline	19	24	104
	Water	5	5	28
If a patient has an acute anaphylactic reaction, the drug of choice is	0.5 ml Epinephrine (1:1,000) subcutaneously	122	92	95
	50 mg diphenhydramine hydrochloride orally	104	45	72
	1 ml Epinephrine (1:1,000) Intravenously	23	97	52
	100 mg diphenhydramine hydrochloride intravenously	1	16	31

the use of standardized questionnaire (as it was unavailable) and the non availability of comparable study instruments. Also, this study is

an attempt to judge the gross awareness of common medical disorders, but the results cannot be generalized given the vastness of the topic

which cannot be condensed into 20 questions. However, the questionnaire was limited to 20 questions in an attempt to collect genuine

Table 7. Responses of all study groups to Group 4 questions: HIV.

Question	Options	Responses		
		Medical	Dental	Nursing
Internationally recognized red ribbon symbol represents which of the following disease	HIV/AIDS	198	227	202
	Cancer	46	10	15
	Hypertension	5	8	20
	Tuberculosis	1	5	13
From a well-known HIV patients, risk of HIV due to needle stick injury is	0.5%	205	29	27
	25%	17	68	59
	100%	6	112	157
	0.3%	22	41	7
Protocol for post exposure prophylaxis is	1 week regimen of zidovudine + lamivudine + stavudine	24	52	59
	4 weeks regimen of zidovudine + lamivudine + stavudine	194	105	61
	No treatment present	22	34	70
	Single dose of zidovudine	10	59	60
Regarding HIV/AIDS patients, are/do you	Willing to live with HIV/AIDS patients in your community	148	136	136
	Reluctant to live with them	52	26	26
	Have empathy towards HIV/AIDS patients	39	64	64
	Dislike having contact with them	11	24	24

responses rather than off handed marking of the questions. Lengthy questionnaires tend to create boredom among the users, who then swiftly mark inaccurate responses in a hurry to finish off the questionnaire.

Conclusion

There is a deficiency existing in the knowledge of medical, dental and nursing students regarding the handling of medically compromised patients. Thus, there is an urgent requirement to modify the existing curriculum during the training period, with

emphasis on emergencies, stressing more on practical applications and provide on-site training for superior proficiency. However, given the vastness of the topic, further studies with relative emphasis on various medically compromised conditions should be conducted on large sample sizes to confirm the findings of our preliminary report.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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