

## Medical Risk Assessment in Dental Patients: A Cross Sectional KAP[Knowledge, Attitude And Practice] Study Among Dental Practitioners in Kingdom of Saudi Arabia.

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### Abstract:

**Background:** With strong medications and improved medical diagnosis and treatments, more and more dental patients will appear on dentists door step with severe medical compromise. This study has attempted to analyze the knowledge, attitudes and practices of the dentists and their involvement with medically compromised dental patients.

**Methods:** A total of 112 dental surgeons were randomly surveyed and response collected in structured google forms. The competency of dentist in the dental practice was assessed on 11 criteria mentioned in the results. The statistical analysis was done using the Decision Analyst 2.00© (12) software.

**Results:** The most common medical emergency episodes reported were of vasovagal attack and the hypoglycemia and in contrast, the clinical conditions of Stroke, adverse reaction to LA and Anginal episode which were least reported. Feedback was predominantly from Government institutions. In areas of mal-practice insurance, standardized case history and their Basic Life support [BLS] training dental practitioners from Government fared much better percentage wise.

**Conclusion:** The primary gaps identified in the dentist training were; improper vigilance for expiry medicines, lack of telephonic link with physician who can assist in the medical emergency and the inability to give intramuscular /intra-venous injections. This study highlights need to identify strengths and weakness in the curriculum of dentists and need to modify the medical risk assessment competency in the dental practitioners of today in the kingdom. A sense of frustration was also noted in the dentists in the kingdom about oversupply of dentists from the local universities.

**Keywords:** Education, Dental, Life support care, Basic Life support(BLS); Medical risk; Saudi Arabia; Dentist frustration.

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### I. Introduction

The dental practitioners form the first line of defense against the oral diseases management in the kingdom. Saudi Arabia has both Government and Private Universities training the dental surgeons. These programs are in a state of evolution and this study attempts to identify the strengths and weaknesses of the dentist's training in domain of medical risk assessment. The cardiopulmonary resuscitation is rarely used in dental clinic, but with increasing incidence of medical complexity in the general population, its role in saving critical patient lives becomes very important.

The Basic Life Support [BLS] training means immediate recognition of clinical problems of ventilation and circulation, during the process of cardiac or respiratory failure. Phillips and Nolan (1). Quality health care means increased number of dental patients with medical risk will be seen in the dental practice environment. Haas D (2). This raises the possibility of increased frequency of emergencies in the dental clinic and dental hospital environment. Hendler and Rose (3).

The dependent variable in this study is the dentist's competency to manage the medically complex dental patients and the independent variables are - audit of expired medicines, direct communication with physician, routine use of intramuscular or intravenous injections, use of medical release form, malpractice insurance, BLS training, Use of Adrenaline, Standardized case history format, use of oxygen cylinder, rational use of antibiotic prophylaxis and use of four handed dentistry - trained assistant, giving obesity related advice to patients.

Different methods of data collection have been used to assess the level of training available for a professional population. However, a retrospective questionnaire is a reasonable and practical way to gather enough data over a sufficiently long period of time to produce meaningful information. Atherton et al (4).

Review of recent literature from Saudi Arabia depicts that very little scientific data is present which tells us about the awareness, knowledge and attitude of the dental practitioners towards the medical risk assessment in the dental clinic. Hence this nation-wide survey study was conducted . It is hoped that this data will help to improve the training of future dental graduates in schools of dentistry through strengthening of curriculum once the weak realms of knowledge and gaps in training are discovered.

## **II. Materials and methods :**

A randomized cross sectional study using a structured questionnaire with eleven independent variables which in turn effected the dependent variable of clinical competency in treatment of Medically complex patients in dentists. An anonymous internet based circulation of structured questionnaire was done and all the dentists were also contacted subsequently over mobile phone to encourage them to answer quickly. Out of total 150 dental surgeons contacted 112 responses were found complete and valid others had to be rejected for incomplete or incoherent answers. ( 74.66% of survey instruments accepted after audit) A software Decision Analyst 2.00 (12) was utilized to calculate the 'Z' score.

**2.1 Study population and design :** The universe was the dental practitioners population of Kingdom of Saudi Arabia and the design was cross sectional, randomized. The hypothesis question stated was 'The dentists training was not adequate; based on eleven independent variables' The structured questionnaire and the researcher not knowing about the identity of the dentist [blinding] was a good model for research. The questionnaires were sent via Google forms to dentists in different parts of the kingdom. All the data collected was entered in Excel sheet and analyzed.

**2.2 Instrument and data collection :** The structured survey instrument was utilized for data collection and a 75% of the dentists responded .

**2.3 Data analysis:** The Microsoft office excel sheet 2007 was used for preliminary statistical analysis . This revealed candid information about the attitudes and awareness of the different dentists in the kingdom. These are tabulated in the tables no 1, no 2 and no 3. The 'Z' value is used evaluate statistically the differences between the Male and female dentists and also private dental school and government dental school dentists.

## **III. Results**

**3.1 Basic Analysis :** A total of 112 dental surgeons were surveyed in depth for basic information [table 1], The figure 1. Shows the graph of 11 item analysis of the BLS steps being practiced by these dentists , figure No. 2 : This shows an item analysis of 16 processes actually done successfully in dental clinic.

To be inserted.

Table no . 1

Figure no. 1

Table no.2

### **3.2 Statistical Analysis**

The statistical analysis was done using Decision Analyst 2.00<sup>12</sup> . The eleven attributes shown in figure no 2, have been analyzed for two groups of data. First the comparison between the male and female dentists, and second between the government and private dentists .

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Table no 3.

Table no 4.

## **IV. Discussion**

On examination of the table no. 3 of our study it is apparent that the percentage of statistical difference of the use of audit of expired medicines , use of adrenaline and regular use of oxygen cylinder all showed a very weak Z value. These were identified as the gaps of training in the dentist. This compared well with study of Atherton et al (4,5)

The classical article by Atherton et al (4,5) on medical emergencies in general dental practice is the study in which about 1500 dental practitioners and about 1000 in Wales and 500 in Scotland were surveyed and the results were quite enlightening. Atherton showed that basic drugs of emergency care were available in 90% of the respondents. This compares with 24% Government dentist and 21% Private college dentists in our study The cardiopulmonary resuscitation (CPR) was carried out in management of 1.1 to 1.4% of the events in the general practice not related to GA.

Our study reflects the conclusion of Chapman's (6) related work in Australia which also throws a veritable light on the state of affairs in the Australian dental landscape as regards to the choice of emergency drugs and equipment. He polled 1250 respondents dental practitioners and found that 1 in 7 ( 14% ) had to resuscitate a patient in their dental clinic. This figure appears to be ten times the data obtained from Atherton's work. So obviously some geographic differences are bound to appear in different parts of the world. In Saudi Arabia we found our dentists both of government and private colleges observed the use of oxygen cylinders in practice and the difference statistically between them was weak.

This dentist study depicts that weak Z values on use of intramuscular and intravenous medications and use of oxygen cylinder, which means we share the opinions of Shearer J et al (7) , who expressed some very strong opinions about allowing the dentists to use the art of conscious sedation and anxiety control. They opined that they did not feel that it was appropriate for the dentists to use it in any form , even the simplest type of conscious sedation. They (7) were probably concerned about their ability to manage emergencies as and when they occurred.

In our series 24% of the Government interns and 53% of the Private interns took the training for Basic life support BLS and displayed their certificates.

Shearer J et al (7) had another serious concern, that the types of trainings available in the British Isles were very varied; consisting of short term courses and in depth courses which may lead to Masters in sedation [M.Sc] , available in London. Considering this variation of training even in an established academic environment of UK, it is easy to see why Shearer et al (7) not very great champions of allowing the dental surgeons into conscious sedation and advanced emergency treatment area, without proper competency training. In the kingdom only one level of BLS certificate given by the red cross, was available.

Coplans and Green (8) agree with the work of Shearer J et al (7) that the use of conscious dentistry is fraught with the risks that are tangible, in terms of medical emergencies in the clinic.

The findings of this series of dentists data agrees with that of Robertson and Rothman (9) , who have analyzed the awareness of medical emergencies in the dental office in the dentist population. They analyzed 182 dentist responses to come to their conclusions. In this study 56% reported receiving the Basic Life Support [BLS] and 34% said that medical emergencies were seen and managed by them. 2% of these dentists responded positive for discovering angioedema in their practice and 5% had seen Angina on their dental chair. An interesting fact that came from this study was that 24 % preferred pre-medication in the dental patients with known history of Epilepsy. About half the number of Government dentists and one third of the private dentists in our series treated emergencies using adrenaline routinely.

O' Hallaran(10) has given a clear map of the clinical approach in his discussion and stated that the systems review, medical history and physical examination, including the body mass index (BMI), should make the dentist determine the medical risk, then grade the patient as per the ASA American Society of Anesthesiologists (ASA) Physical Status Classification System. It is generally agreed upon that ASA1 and the ASA 2 are treated in the dental clinic with least complications.

Maisa O et al (11) have studied the preparedness of the private dental clinics in Jeddah and found that deficiency in personnel training, availability of drugs, and emergency equipment in the surveyed dental clinics.

Our study was predominantly done with data from the western parts of the kingdom and we report an interesting study by Alhamad et al (13) (12) who have worked in the eastern province of Saudi Arabia. Their findings of vasovagal attack and hypoglycemia being the most commonly encountered complications is shared completely by our study.

They (13) (12) further opined that medical emergency situations were common in dental clinics, but a considerable proportion of dentists did not feel at ease to handle medical emergency conditions.

The level of BLS training in kingdom is available at only one level, that is provided for three days by the Red Cross. The facilities of Government and Private clinics compared well with each other. In this study more dentists from government gave feedback as compared with private dental colleges.

In the remarks section which was last blank given to dentists 99 out of 112 felt that there were too many dentists graduating from the dental schools in the kingdom and that already a glut of dentists was causing frustration in the kingdom of Saudi Arabia. Arab News (14)–(13)

## **V. Conclusion**

From the above study these conclusions may be summarized.

1. The Use of trained nurse , a medico-legal release form and a standardized case history form were well documented in the Government dental schools and very much less in the private dental schools, hence very strong statistical differences in their occurrence.
2. The use of Oxygen cylinder and antibiotic prophylaxis were more in the government facilities , both in terms of availability, observance and usage .

3. The malpractice insurance is a mandatory for all practitioners hence we found both government and private interns had covered themselves with it and between 24.19% to 53.7% .
4. The medical emergency cabinet was audited and checked by 21.4% to 24.19% dentists in the kingdom and through training, this was perceived as a gap and needs to be improved.
5. It is the finding of this study that BLS , Malpractice insurance and the standardized Case history form should be made mandatory if the medical risk of dental patients need to be improved dramatically in the coming years. The training gaps of dentists in medical risk domain may vary with the regions of kingdom surveyed hence more studies must be attempted and specific gaps identified and filled as a part of designing their curriculum in the coming years.
6. A high percentage of dentists were frustrated [88.39%] due to inability to get jobs attributed to oversupply of dentists from the local universities in the Saudi Arabia. Arab news (14)- (13)

Conflict of interest: The author has no conflict of interest to declare

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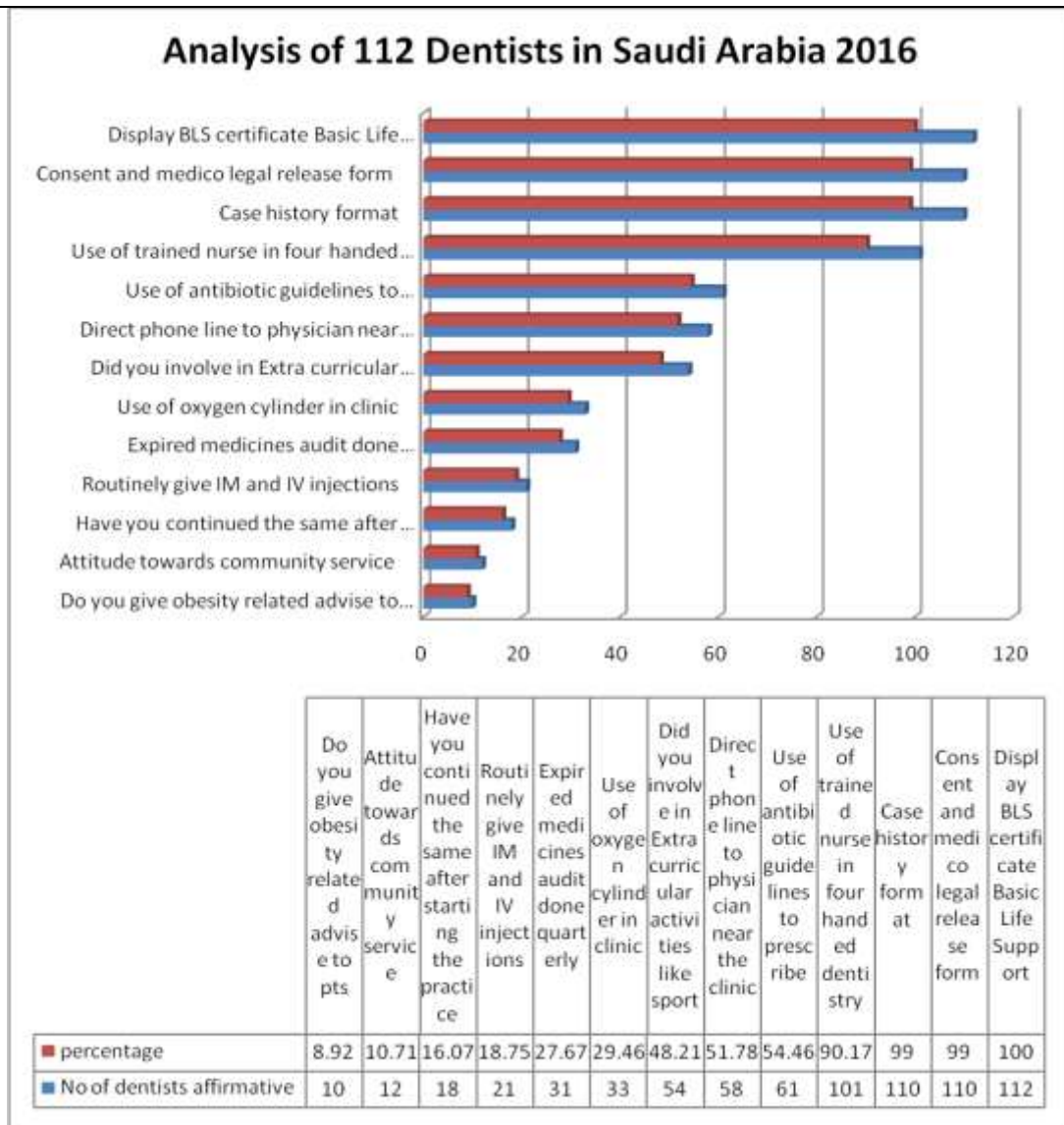
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Sex	Male	Female		Remarks
Data	90 [80.35%]	22[19.64%]		Predominantly male
Type of dental school	Government	Private		
	85[75.89%]	27[24.10%]		Predominantly Government
Region of the dental school	North	20	17.85%	
	South	18	16.07%	
	West	38	33.92%	Sample was weighted to the west region
	East	19	16.96%	
	Middle	17	15.17%	

Foot note: This nation wide study of Saudi Arabia depicts the sex distribution, government vs Private distribution and the regional distribution of the sampled dentists. Bailoor and Al-Shamrani 2016

**Figure No. 1**

This depicts the fact that use of trained nurse, case history format, consent form and display of basic life support certificate , all were seen uniformly in all clinics; whereas the neglected areas were the lack of obesity related advise, negative attitude towards the voluntary work, doing extracurricular work and sports, and the ability to give Intra venous and intramuscular injections. The thirteen characteristics analyzed other issues like expired meds audit , direct phone line to physician and use of antibiotic guidelines were in the range of 20 to 50 percent.



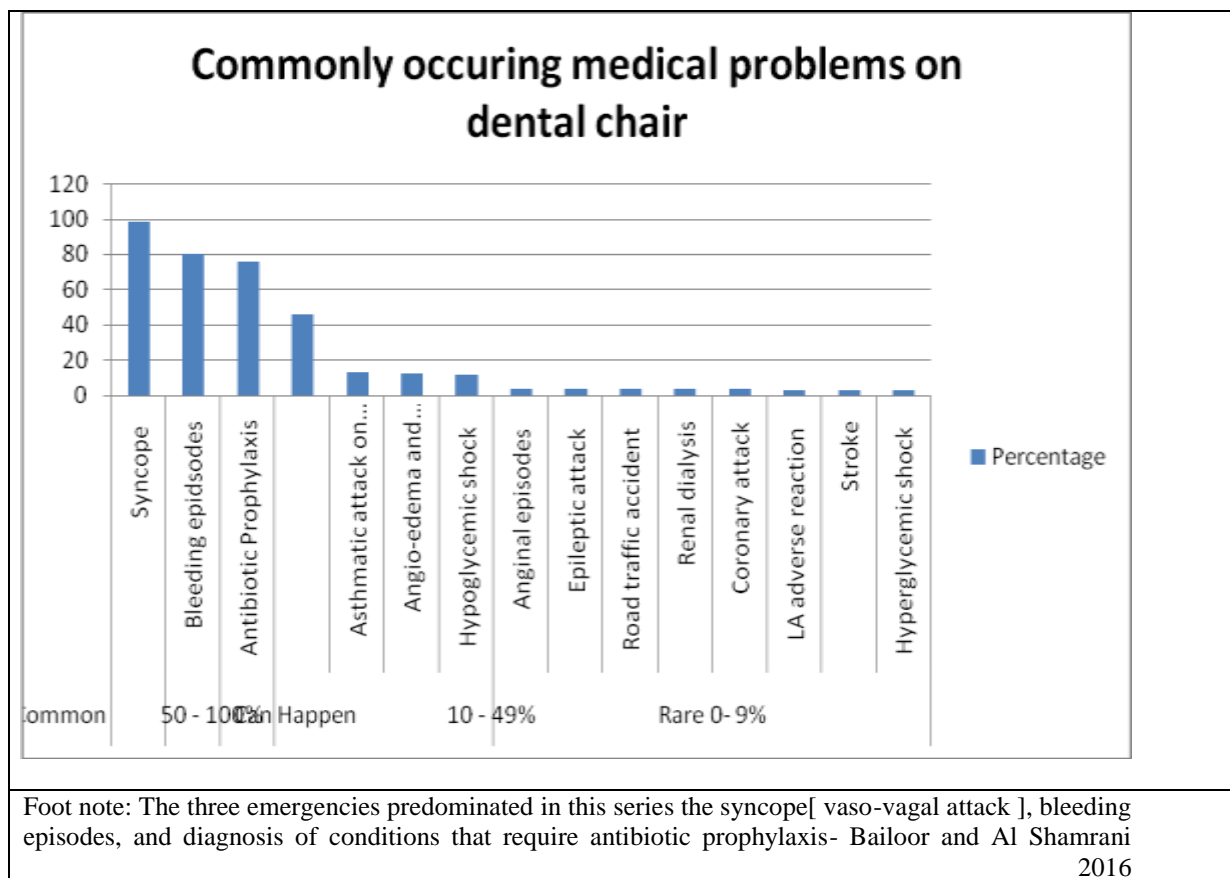
Foot note: Giving of Obesity related advise, and attitude towards the community service was the worst numerically polled. Bailoor and Al Shamrani 2016.

**Table No. 2 :**

This shows an item analysis of medical risk and the 16 processes actually done successfully by a set of 112 dental surgeons surveyed in the kingdom of Saudi Arabia . The three most common and successfully managed in this series was the Syncope , bleeding episodes and use of prophylactic antibiotics ; the rare cut off point used was 4 percent and it constituted of anginal attacks, epileptic fits, anaphylactic attacke, Post road traffic accident , renal dialysis , coronary attack, reaction to LA, Stroke and hyperglycemic shock. Showing the incidents analyzed in the 112 dental clinics categorized into Common = 50- 100% ; Can Happen =10-49% ; Rare = 0 - 9% , This will help the dentists to be prepared for the common as well as the rare . Bailoor and Al Shamrani 2016.

Medical Emergency / Risk observed	Number	Percentage	How often encountered
Syncope	110	98.2	Common
Bleeding episodes	90	80.35	Common
Identifying need for antibiotic prophylaxis	85	75.89	Common
Medical compromise of multi-system encountered	51	45.53	Can Happen
Asthmatic attack on dental chair	15	13.39	Can Happen
Angio-edema and allergic reactions	14	12.5	Can Happen
Hypoglycemic Shock	13	11.6	Can Happen
Anginal episodes during dental treatment	5	4	Rare
Epileptic attach on dental chair	5	4	Rare
Anaphylaxis in the dental clinic	5	4	Rare
Road traffic accident and Post RTA shock	4	3,5	Rare
Renal dialysis patients coming as OPD dental	4	3.5	Rare
Coronary Attack during the treatment	4	3.5	Rare
Adverse reaction to Local Anesthesia during extraction/biopsy	3	2.6	Rare
Foot Note : Incidents occurring in 50-100 percentage were shown as common , 10-49 percentage were shown to as Can Happen and below 9 percentage were deemed to be rare. Bailoor and Al Shamrani 2016			

<b>Figure No 2:</b>
Figure showing graphically the different medical emergency episodes in the 112 dental clinics of Saudi Arabia as per this cross sectional study . Bailoor and Al Shamarani 2016



**Table No. 3:**

Shows the differences between **the Male and Female** dentists in eleven factor item analysis . the software Decision Analyst was used to determine the statistical significance between the males and females .  
 Items , use of medico-legal release form and usage of standardized history format showed a strong difference between the males and the females .  
 Items , Regular audit for expired meds, Adrenaline use , and routine use of assistant and four handed dentistry showed no significant difference and all other items showed a weak difference in applications of these criteria in the routine dental practice in the domain of medical risk assessment.

Crite ria	Nu me ric al Male	Nu me ric al Female	% Male	% Female	P O S D	Diff eren ce Sign ifica nce
Obesity related advise	11	5	12.22	22.71	45%	Weak
Community service attitude	46	18	51.11	81.11	78.4%	Strong
Have you continued the same	31	7	34.44	8.11	23.5%	Weak
Rou	81	21	90	9	5	Mod

	ntinely give IM and IV injections			0	5 . 4 5	3 . 8 5 %		erate	
	Expired medicine audit qtrly	88	22	9 7 . 7 7	1 0 0	5 2 . 4 5 %		Moderate	
	Use of oxygen cylinder in clinic	15	17	1 6	7 7 . 2 7	9 9 . 9 6 %		Strong	
	Do you do extra curricular-like sports	9	3	1 0	1 3 . 6 3	4 5 . 3 5 %		Weak	
	Direct phone line to physician	14	22	2 2 . 5 8	1 0 0	1 0 0 %		Strong	
	Diagnose the need for antibiotic prophylaxis	24	20	3 8 . 7	7 1 . 4 2	9 6 . 8 4 %		Strong	
	Certified nurse in 4 handed work	28	20	4 5 . 1 6	7 1 . 4 2	8 9 . 5 4 %		Strong	
	Standard case format	20	8	3 2 . 2 5	2 8 . 5 7	2 0 . 8 7 %		Weak	
	Consent and medicorelease	89	21	9 8 . 8 8	9 5 . 4 5	7 3 . 8 3 %		Strong	



Display BLS certificate	90	22	100	100	*		It is compulsory so all displayed
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Foot note : Strong differences emerged between the male and female dentists in these areas : Community service attitude, Use of oxygen cylinder , direct phone access to physician, diagnose the need for antibiotic prophylaxis, certified assistant for four handed dentistry, Use of consent form and medico-legal release form. Bailoor and Al Shamrani 2016

**Table no.4:**  
 This table shows the eleven item analysis between the Dentists working for Government and Private. Certain items showed a significant statistical difference. The weakest difference in Government [85] and Private[27] Dentists emerged in community service and obesity related medical advice .

Criteria	Numerical Govt	Numerical Private	% Private	Z value	Remarks about difference
Obesity related advice	15	6	21.42	0.486	Weak
Attitude towards community service	30	10	35.71	0.548	Weak
Have you continued the same after starting practice	9	7	25	0.888	Moderate
Routinely give him	60	28	100	0.977	Moderate

	and iv injec tions							
	Expi red medi cine audit done quart erly	9	9		32 .1 4		1.1 34	Str on g
	Oxy gen cylin der use	15	15		53 .5 7		1.4 91	Str on g
	Invo lvem ent in extra - curri cular activ ities like sport	28	20		71 .4 2		1.6 23	Str on g
	Dire ct phon e line to phys ician	14	6		21 .4 2		0.4 86	We ak
	Diag nose the need for antib iotic prop hyla xis	60	18		64 .2 8		3.6 79	Str on g
	Cons ent and medi co legal relea se	62	10		37 .0 3		2.0 51	Str on g
	Stan dard case form	62	8		37 .0 3		2.0 51	Str on g

	at							
	Certi fied assis tant 4 hand ed denti stry	60	11		40 .7 4		2.8 05	Str on g
	Disp lay BLS train ing certi ficat e	85	27		10 0		**	Its co mp uls ory in the kin gd om so all dis pla y

POSD= Percentage of statistical difference.

The following showed a strong difference between the government and private trained dentists : Expired medicines audit, use of oxygen cylinder, extracurricular activities , diagnose the need for antibiotic prophylaxis , Proper use of consent and medicolegal release , standardized case history format , and the concept of four handed dentistry. Bailoor and Al Shamrani 2016.