CHAPTER IV
DATA ANALYSIS AND INTERPRETATION OF RESULTS

4.1.Demographics

Sample Description

The 700 questionnaires that were found complete were compiled and analyzed. Out of the total participants, 327 (46.7%) were male and 373 (53.3%) were females. Among these participants 535(76.4%) had 0-5 years of experience in clinical practice, 99(14.1%) had 6-10 years of experience, 36(5.1%) had 11-15 years of clinical experience, 16(2.3%) had 16-20 years of experience in practice, 4(0.6%) had 21-25 years of clinical experience, 5(0.7%) had 26-30 years of clinical experience and 4(0.6%) had 31-35 years of experience in dental practice.

4.2.Level of Degree

Among the 700 practitioners, 580 were general practitioners while 120 were the specialist with Masters in the specific discipline of dentistry. Among the 580 general practitioners, 319 were females and 261 were males. Among the specialists, 66 were males and 54 females. (Figure 1, Figure 2)

Figure 1: Graphical representation based on Degree (BDS & MDS)

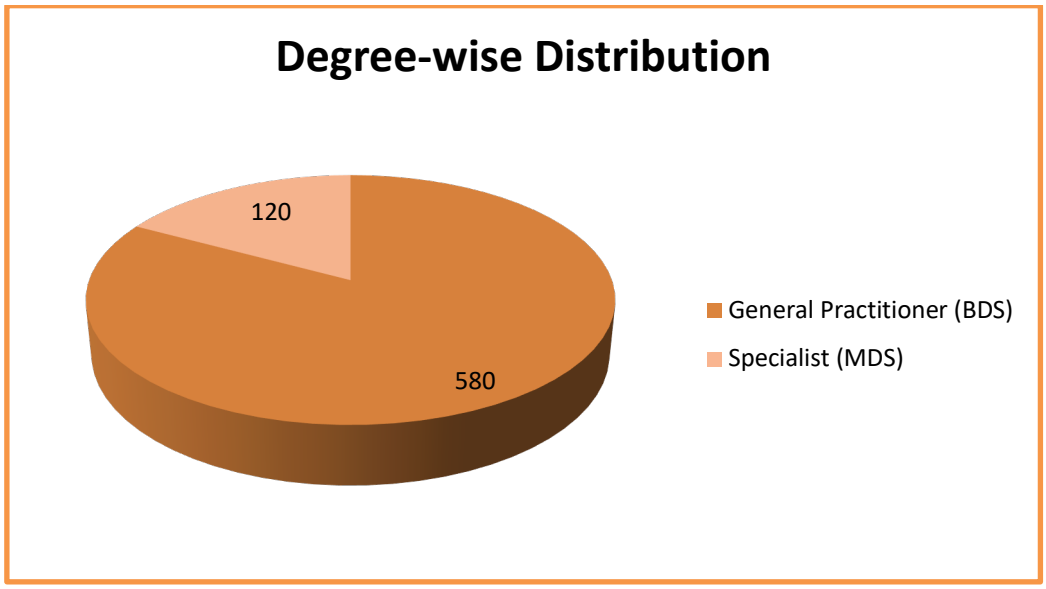
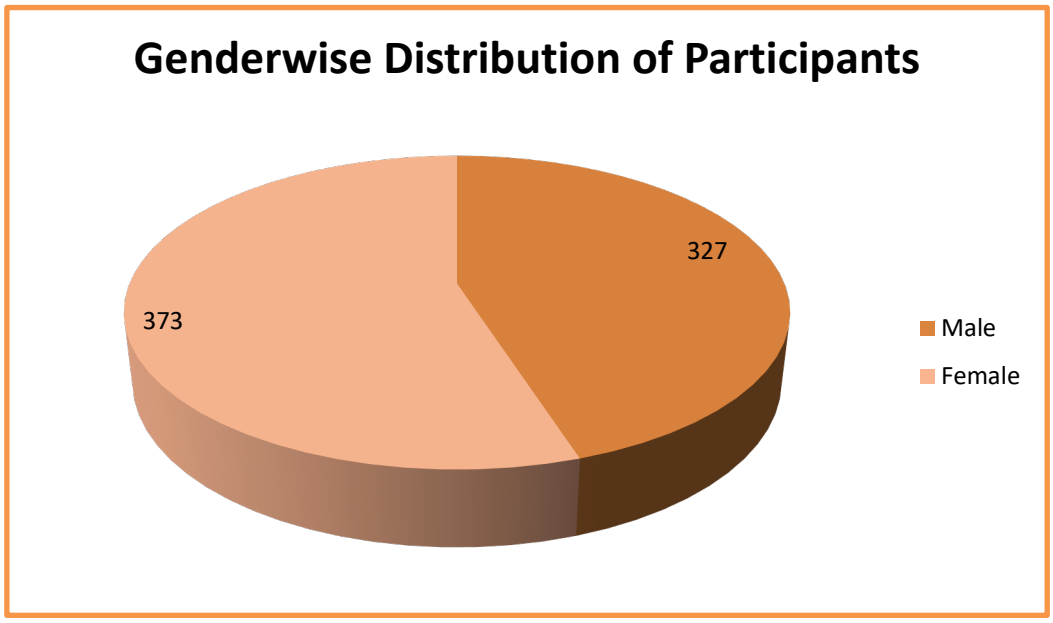


Figure 2: Graphical representation of Gender-wise Distribution



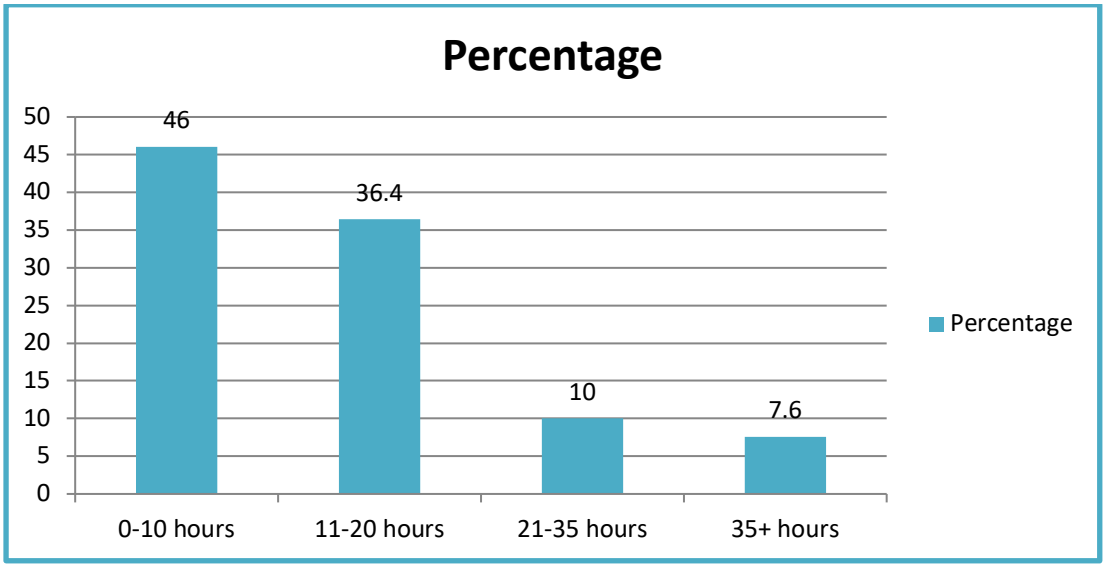
4.3. Past CDE Credit hours

When asked about the hours of Continuing Dental Education received in last one year, 322(46%) had attended the Continuing Professional Development programs for 0-10 hours while 255 (36.4%) attended for 11-20 hours, 70 (10%) for 21-35 hours and only 53 (7.6%) attended for more than 35 hours. (Table 1, Figure 3)

Table 1: Distribution of participants based on number of hours of CDE received in last one year

Hours of CDE received	Number	Percentage
0-10 hours	322	46.0
11-20 hours	255	36.4
21-35 hours	70	10.0
35+ hours	53	7.6
Total	700	100.0

Figure 3: Graphical representation of participants based on number of hours of CDE received in last

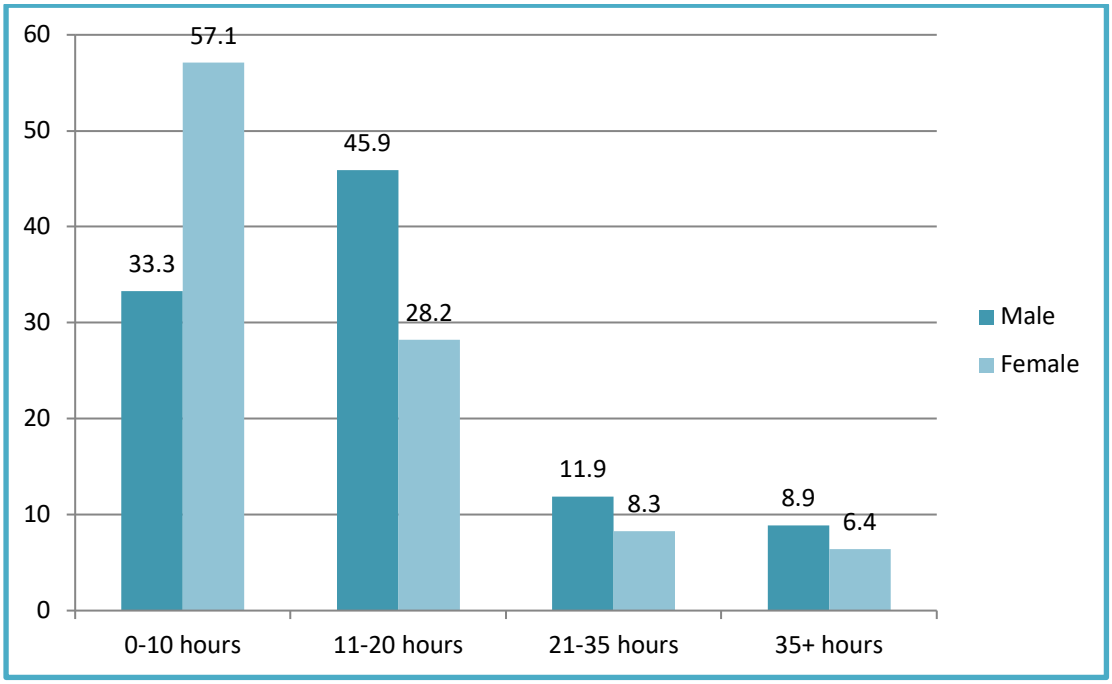


When the hours of Continuing Development Programs was analyzed to check the impact of the gender, it was found that 109 males attended the professional development courses for 0-10 hours as against 213 females. 150 males and 105 females attended the courses for 11-20 hours, while for 21-35 hours there were 39 males and 31 females. For the courses more than 35 hours, there were 29 males and 24 females. The very high significant difference($p<0.001$) was observed when gender comparison was done with hours of CDE received in last year. (Table 2, Figure 4)

Table 2: Distribution of participants based on gender and number of hours of CDE received in last one year

Gender	Hours of CDE received				Total	Chi Square
	0-10 hours N(%)	11-20 hours N(%)	21-35 hours N(%)	35+ hours N(%)		
Male	109(33.3)	150(45.9)	39(11.9)	29(8.9)	327	
Female	213(57.1)	105(28.2)	31(8.3)	24(6.4)	373	**0.000***
Total	322(46)	255(36.4)	70(10)	53(7.6)	700	

Figure 4: Graphical representation of participants based on gender and number of hours of CDE received in last one year

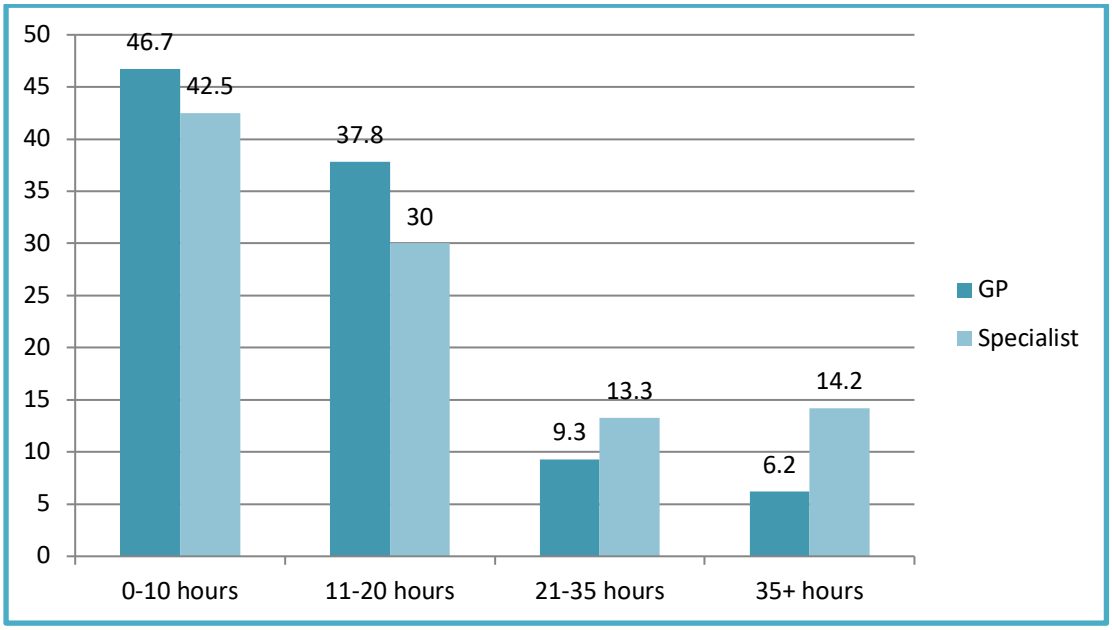


The Continuing Dental Education hours were analyzed to check the impact of the level of degree of practitioners. High significance ($p<0.01$) was seen among general practitioners and specialists. (Table 3, Figure 5)

Table 3: Distribution of participants based on Level of Degree and number of hours of CDE received in last one year

Type of Practitioners	Hours of CDE received				Total	Chi Square
	0-10 hours N(%)	11-20 hours N(%)	21-35 hours N(%)	35+ hours N(%)		
General	271(46.7)	219(37.8)	54(9.3)	36(6.2)	580	
Specialist	51(42.5)	36(30)	16(13.3)	17(14.2)	120	**0.008***
Total	322(46)	255(36.4)	70(10)	53(7.6)	700	

Figure 5: Graphical representation of participants based on Level of Degree and number of hours of CDE received in last one year



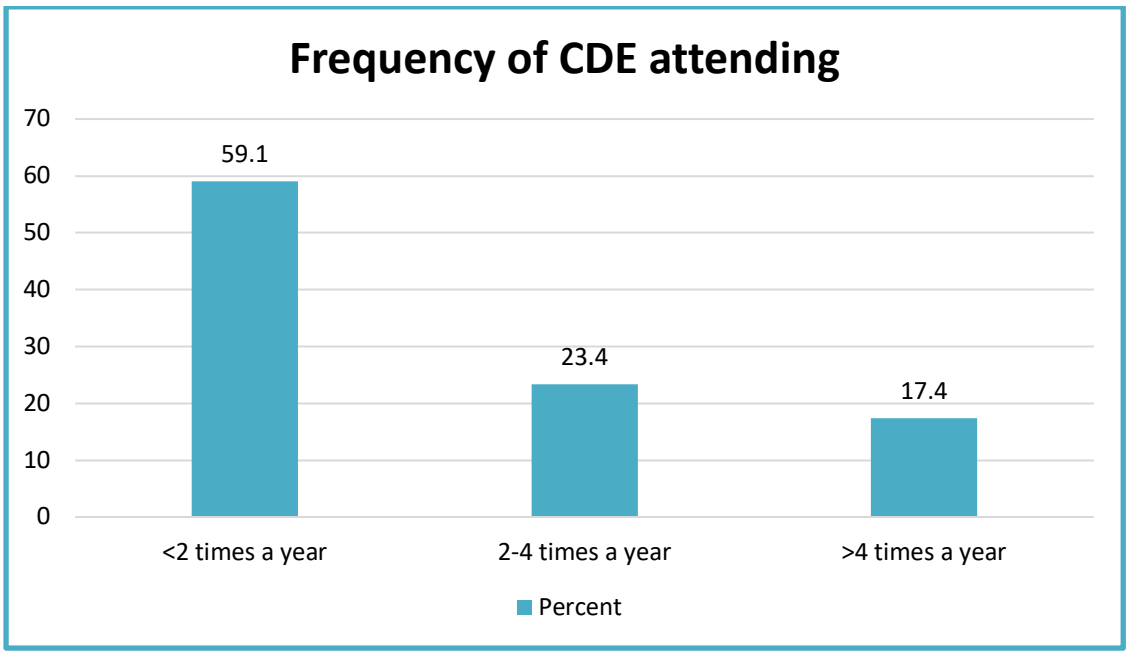
4.4.Frequency of attending CDE Programs

The Continuing Dental Education with live demonstration was attended by 414 (59.1%) participants for less than 2 times a year. 122 (17.4%) participants attended the similar programs for more than 4 times a year while 164 (23.4) attended for 2-4 times a year. (Table 4, Figure 6)

Table 4: Distribution of participants based on frequency of CDE attended in last one year

Frequency of CDE attending	Frequency	Percent
<2 times a year	414	59.1
2-4 times a year	164	23.4
>4 times a year	122	17.4
Total	700	100.0

Figure 6: Graphical representation of participants based on frequency of CDE attended in last one year

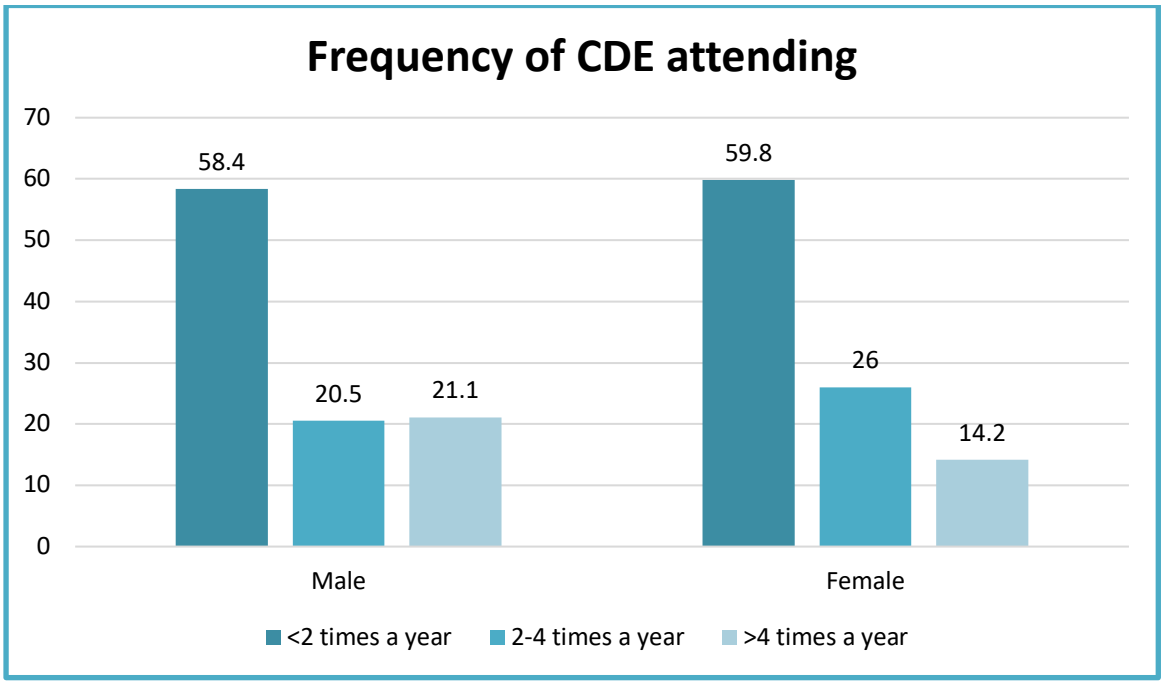


The frequency of CDE was analyzed taking the gender as a variable, it was observed to be statistically ($p<0.05$) significant. (Table 5, Figure 7)

Table 5: Distribution of participants based on Gender and frequency of CDE attended in last one year

Gender	Frequency of CDE attending			Total	Chi Square
	<2 times a year N(%)	2-4 times a year N(%)	>4 times a year N(%)		
Male	191(58.4)	67(20.5)	69(21.1)	327	**0.029***
Female	223(59.8)	97(26)	53(14.2)	373	
Total	414(59.1)	164(23.4)	122(17.4)	700	

Figure 7: Graphical representation of participants based on Gender and frequency of CDE attended in last one year

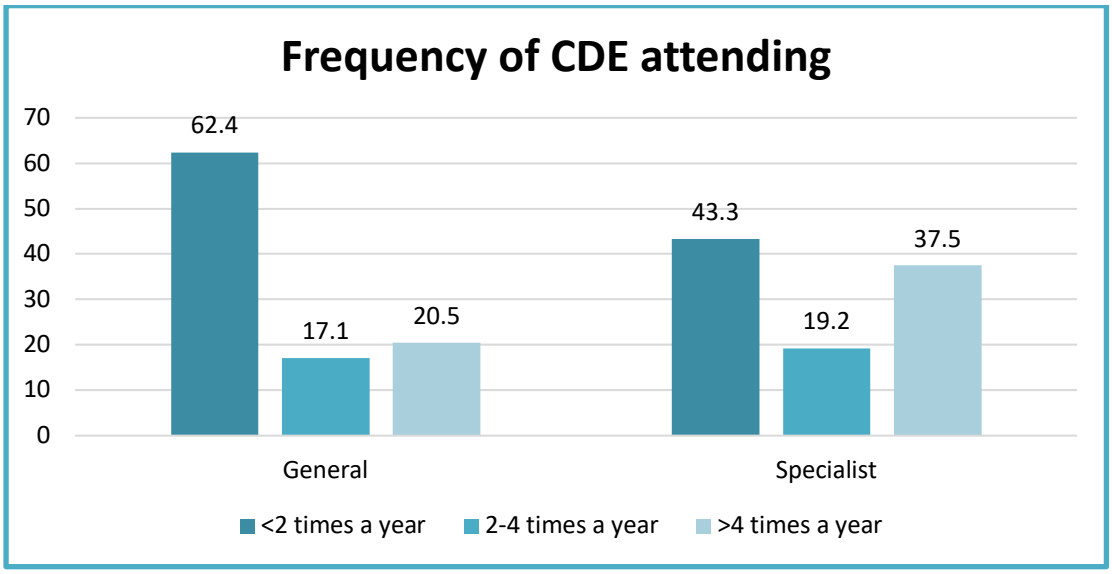


The frequency of CDE was analyzed taking the level of degree as a variable, it was observed to be very highly significant($p<0.05$). (Table 6, Figure 8)

Table 6: Distribution of participants based on Level of Degree and frequency of CDE attended in last one year

Type of Practitioners	Frequency of CDE attending			Total	Chi Square
	<2 times a year N(%)	2-4 times a year N(%)	>4 times a yearN(%)		
General	362(62.4)	99(17.1)	119(20.5)	580	**0.000***
Specialist	52(43.3)	23(19.2)	45(37.5)	120	
Total	414(59.1)	164(23.4)	122(17.4)	700	

Figure 8: Graphical representation of participants based on Level of Degree and frequency of CDE attended in last one year



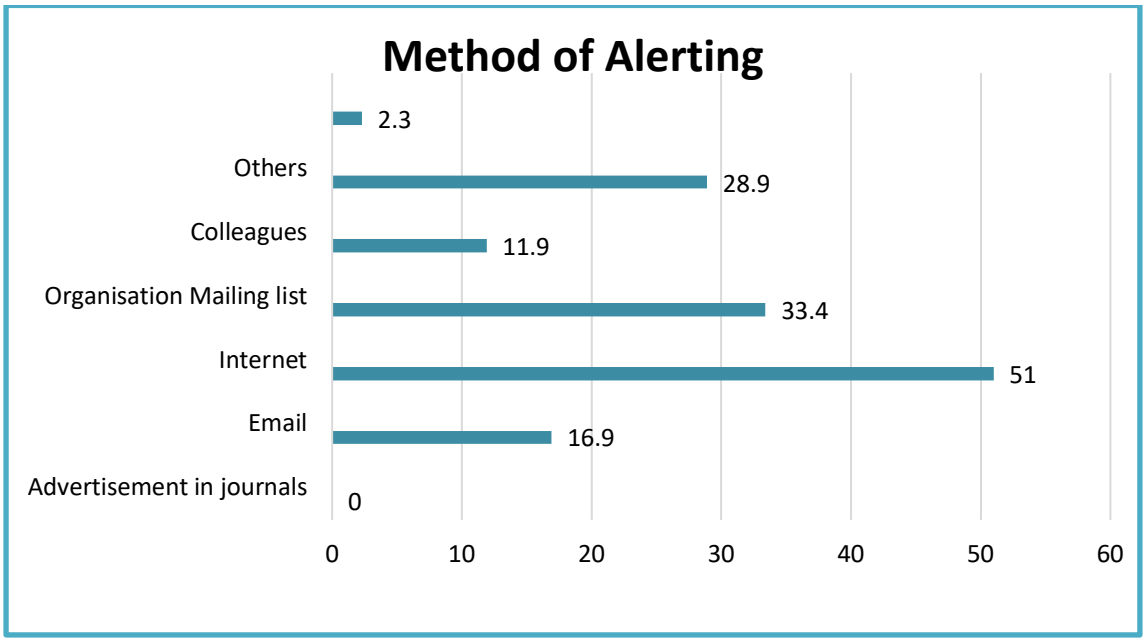
4.5.Information/Alerts for upcoming CDE programs

The participants were asked regarding the ways and mediums through which they were alerted for the upcoming professional development programs. The maximum participants were alerted through Email (51%) followed by the other ways of information dissemination through Internet (33.4%). Some of the participants were also alerted by their colleagues (28.9%), through the information in the journals and periodicals (16.9%). 83 participants (11.9%) were alerted through mailing list and alerts by the professional bodies like Dental Associations and Study Groups. (Table 7, Figure 9)

Table 7: Distribution of ways of alerting regarding upcoming CDE Events

Method of Alerting	N(%)
	Yes
Advertisement in journals	118(16.9)
Email	357(51)
Internet	234(33.4)
Organisation Mailing list	83(11.9)
Colleagues	202(28.9)
Others	16(2.3)

Figure 9: Graphical representation of ways of alerting regarding upcoming CDE Events

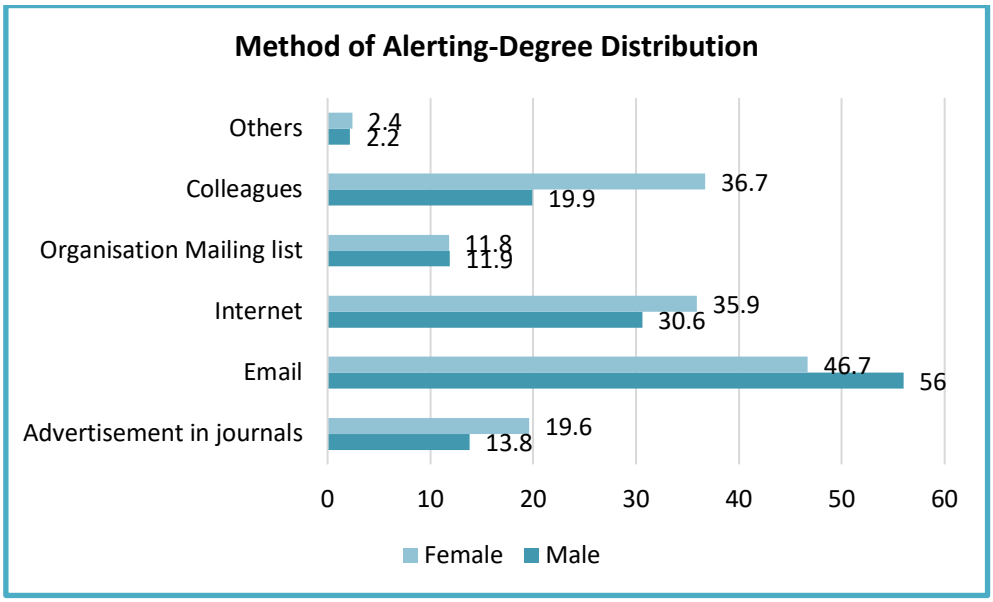


The analysis of this information with gender as a variable showed statistically significant difference ($p<0.05$) for Advertisement in journal and Email, while very high significance was observed for information through colleagues. (Table 8, Figure 10)

Table 8: Gender-wise Distribution of ways of alerting regarding upcoming CDE Events

Method of Alerting	Gender	Response N(%)	Chi-square value
Advertisement in journals	Male : 327 (100)	45(13.8)	**0.041***
	Female: 373 (100)	73(19.6)	
Email	Male : 327 (100)	183(56)	**0.014***
	Female: 373 (100)	174(46.7)	
Internet	Male : 327 (100)	100(30.6)	0.135
	Female: 373 (100)	134(35.9)	
Organisation Mailing list	Male : 327 (100)	39(11.9)	0.958
	Female: 373 (100)	44(11.8)	
Colleagues	Male : 327 (100)	65(19.9)	**0.000***
	Female: 373 (100)	137(36.7)	
Other	Male : 327 (100)	7(2.2)	0.810
	Female: 373 (100)	9(2.4)	

Figure 10: Gender-wise Distribution of ways of alerting regarding upcoming CDE Events

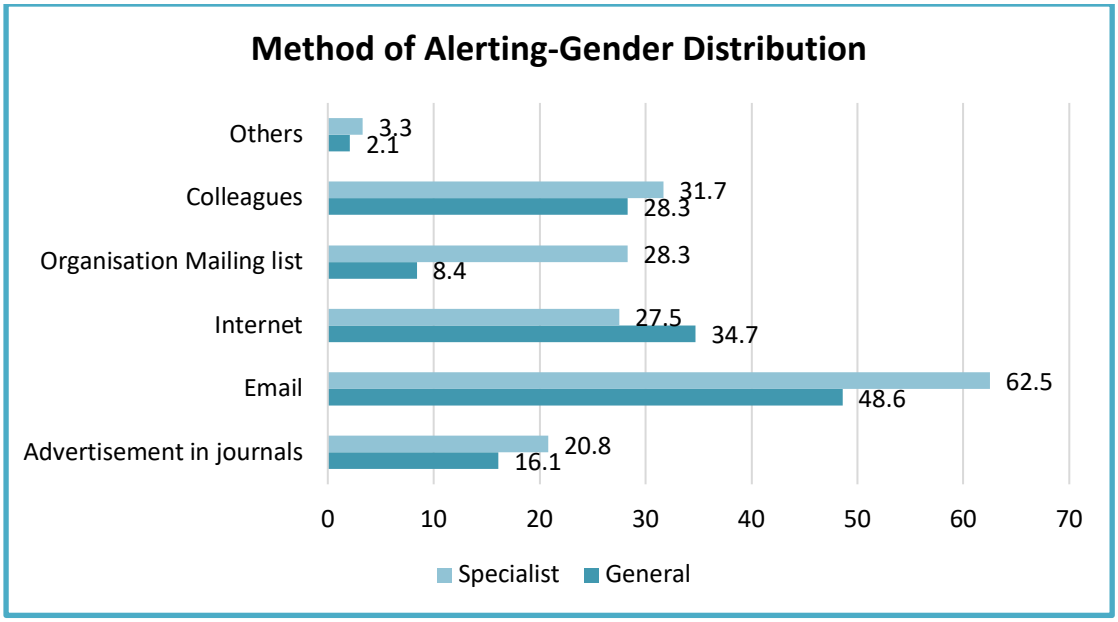


The level of specialization was evaluated to check the distribution among different ways of alerting. High significance ($p<0.01$) was observed for the email alerts and very high significance ($p<0.001$) for Organisation mailing list. (Table 9, Figure 11)

Table 9: Level of Degree-wise Distribution of ways of alerting regarding upcoming CDE Events

Method of Alerting	Type of Practitioner	Total N(%)	Chi-square value
Advertisement in journals	General (580)	93(16.1)	0.201
	Specialist (120)	25(20.8)	
Email	General (580)	282(48.6)	**0.006***
	Specialist (120)	75(62.5)	
Internet	General (580)	201(34.7)	0.130
	Specialist (120)	33(27.5)	
Organisation Mailing list	General (580)	49(8.4)	**0.000***
	Specialist (120)	34(28.3)	
Colleagues	General (580)	164(28.3)	0.456
	Specialist (120)	38(31.7)	
Other	General (580)	12(2.1)	0.399
	Specialist (120)	4(3.3)	

Figure 11: Level of Degree-wise Distribution of ways of alerting regarding upcoming CDE Events



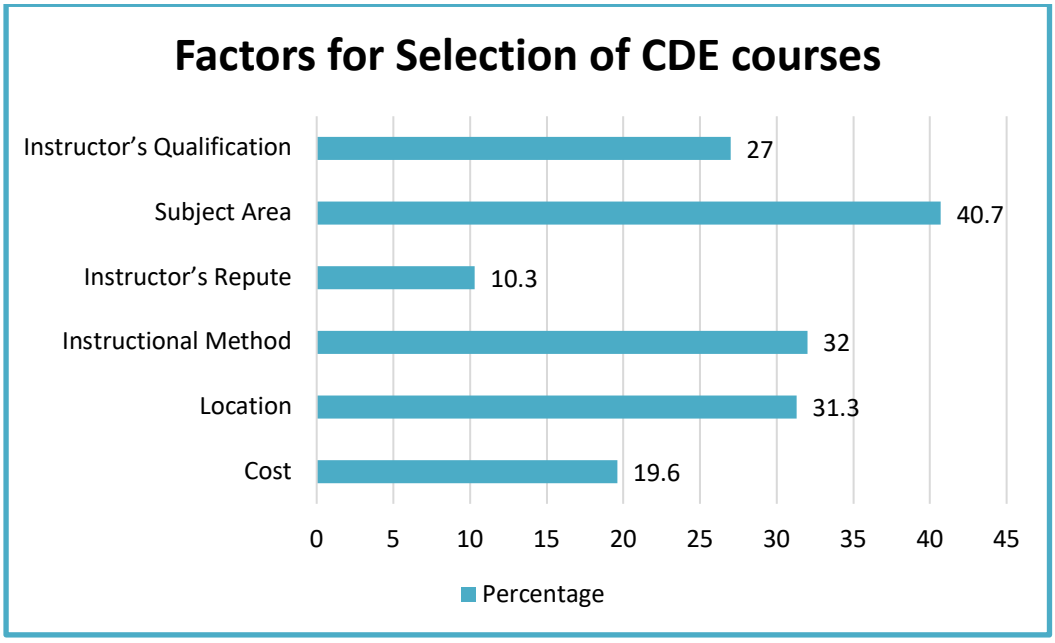
4.6.Factors for Selection of CDE courses

The practitioners were enquired for the important factors in deciding the CDE courses. The subject area of the course (40.7%) was the most preferred factor in selection of the course followed by instructional method (32%) and location of the course (31.3%). Many of the practitioners considered the qualification of the instructor (27%) as an important factor in selection. (Table 10, Figure 12)

Table 10: Factors for Selection of CDE courses

Selection of Course	N(%)
	Yes
Cost	137(19.6)
Location	219(31.3)
Instructional Method	224(32)
Instructor's Repute	72(10.3)
Subject Area	285(40.7)
Instructor's Qualification	189(27)

Figure 12: Graphical representation of Factors of CDE course selection

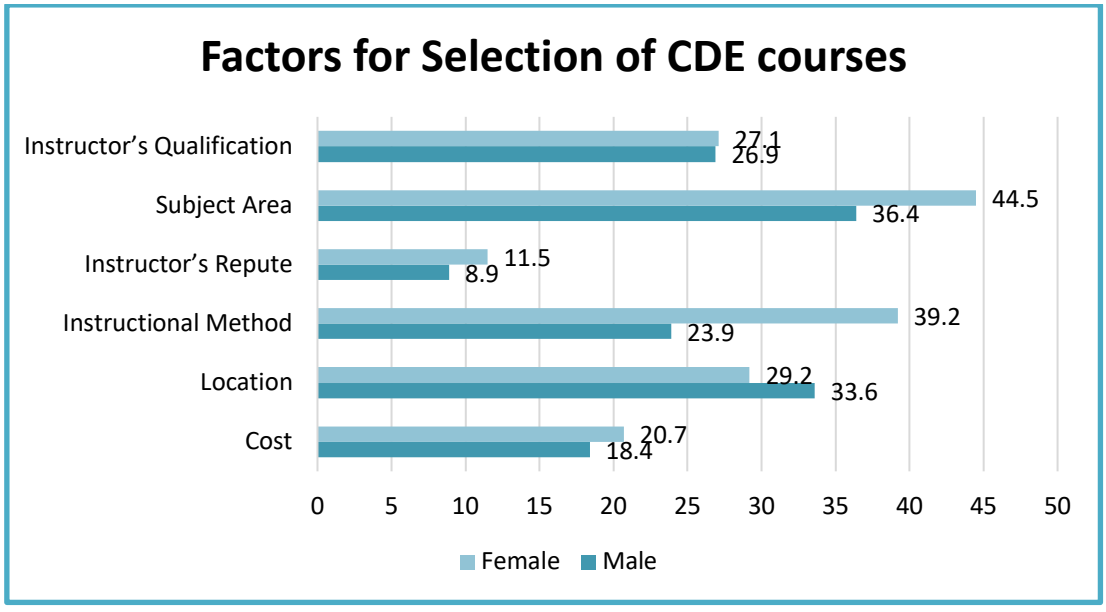


The factors for selection of the course were analyzed with Gender as a parameter. It was observed that Instructional method was very highly significant ($p<0.001$) and subject area of the course was significant($p<0.05$). (Table 11, Figure 12)

Table 11: Gender-Wise distribution of Factors for Selection of CDE courses

Selection of Course	Gender	Total N(%)	Chi-square value
Cost	Male (327)	60(18.4)	0.445
	Female(373)	77(20.7)	
Location	Male (327)	110(33.6)	0.209
	Female(373)	109(29.2)	
Instructional Method	Male (327)	78(23.9)	**0.000***
	Female(373)	146(39.2)	
Instructor's Repute	Male (327)	29(8.9)	0.248
	Female(373)	43(11.5)	
Subject Area	Male (327)	119(36.4)	**0.029***
	Female(373)	166(44.5)	
Instructor's Qualification	Male (327)	88(26.9)	0.961
	Female(373)	101(27.1)	

Figure 13: Gender-Wise distribution of Factors for Selection of CDE courses



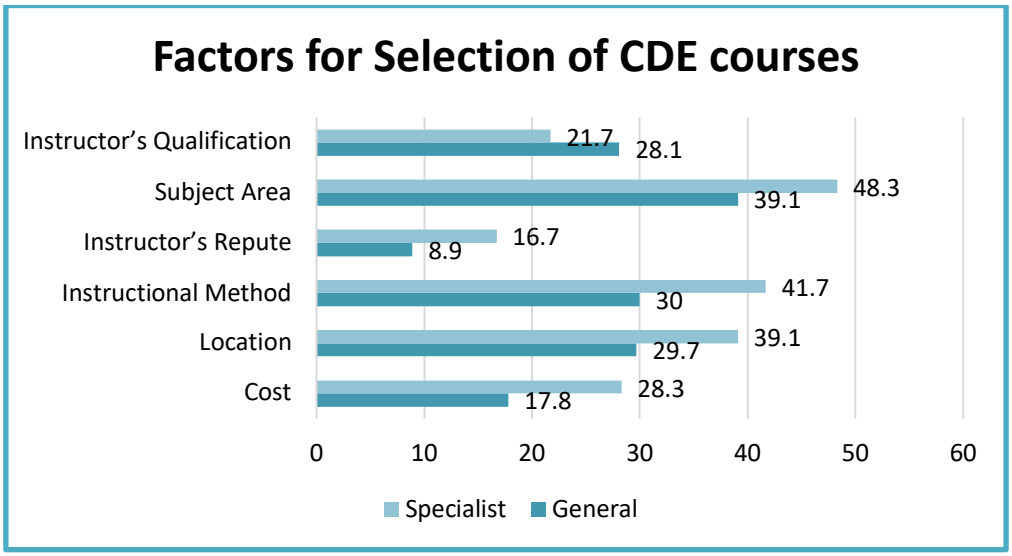
The level of degree among the practitioners was evaluated to check the effect on the factors of selection of course. It was observed that the cost of the course was highly

significant ($p<0.01$), while Instructional method and Instructor's repute were significant ($p<0.05$). (Table 12, Figure 14)

Table 12: Level of Degree-Wise distribution of Factors for Selection of CDE courses

Selection of Course	Degree	Total N(%)	Chi-square value
Cost	General (580)	103(17.8)	**0.008***
	Specialist (120)	34(28.3)	
Location	General (580)	172(29.7)	0.41
	Specialist (120)	47(39.1)	
Instructional Method	General (580)	174(30)	**0.013***
	Specialist (120)	50(41.7)	
Instructor's Repute	General (580)	52(8.9)	**0.011***
	Specialist (120)	20(16.7)	
Subject Area	General (580)	227(39.1)	0.062
	Specialist (120)	58(48.3)	
Instructor's Qualification	General (580)	163(28.1)	0.148
	Specialist (120)	26(21.7)	

Figure 14: Level of Degree-Wise distribution of Factors for Selection of CDE courses



4.7. Preferred method of Instruction

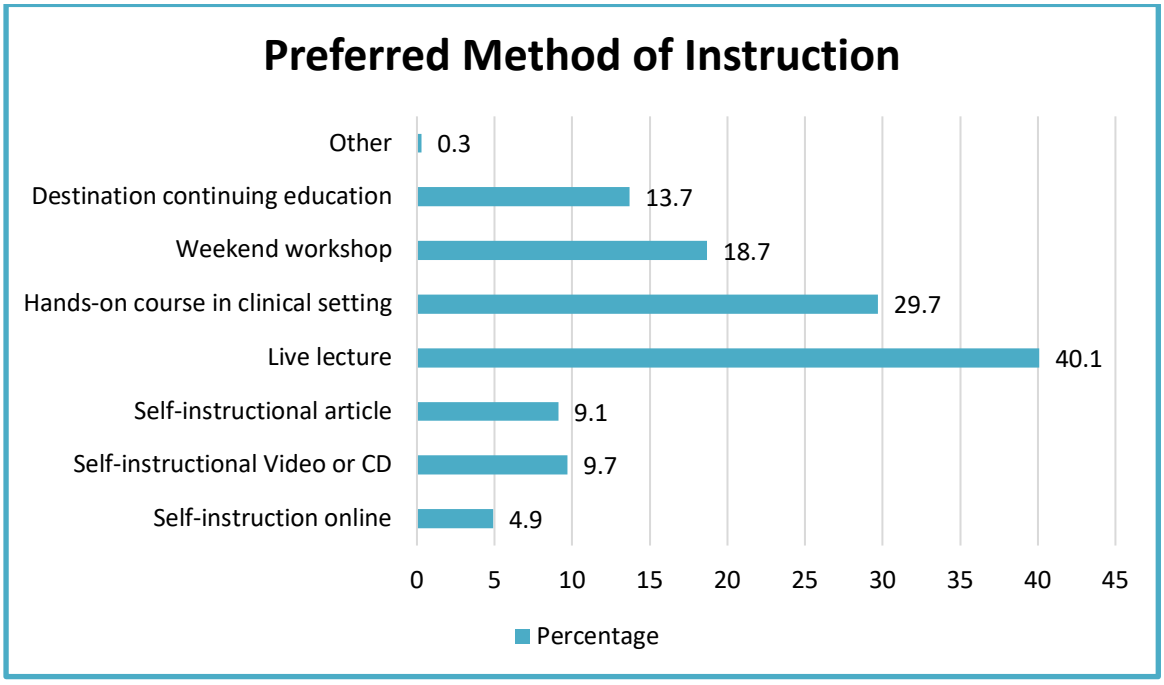
The participants were asked for their preferred method of instructions for the professional development courses. The live lecture was the most preferred method

instruction (40.1%) followed by Hands-on course in clinical setting (29.7%) and weekend workshop (18.7%). (Table 13, Figure 15)

Table 13: Preferred method of Instruction

Preferred Method of Instruction	N (%)
	Yes
Self-instruction online	104(4.9)
Self-instructional Video or CD	68(9.7)
Self-instructional article	64(9.1)
Live lecture	281(40.1)
Hands-on course in clinical setting	208(29.7)
Weekend workshop	131(18.7)
Destination continuing education	96(13.7)
Other	2(0.3)

Figure 15: Graphical representation showing Preferred method of Instruction



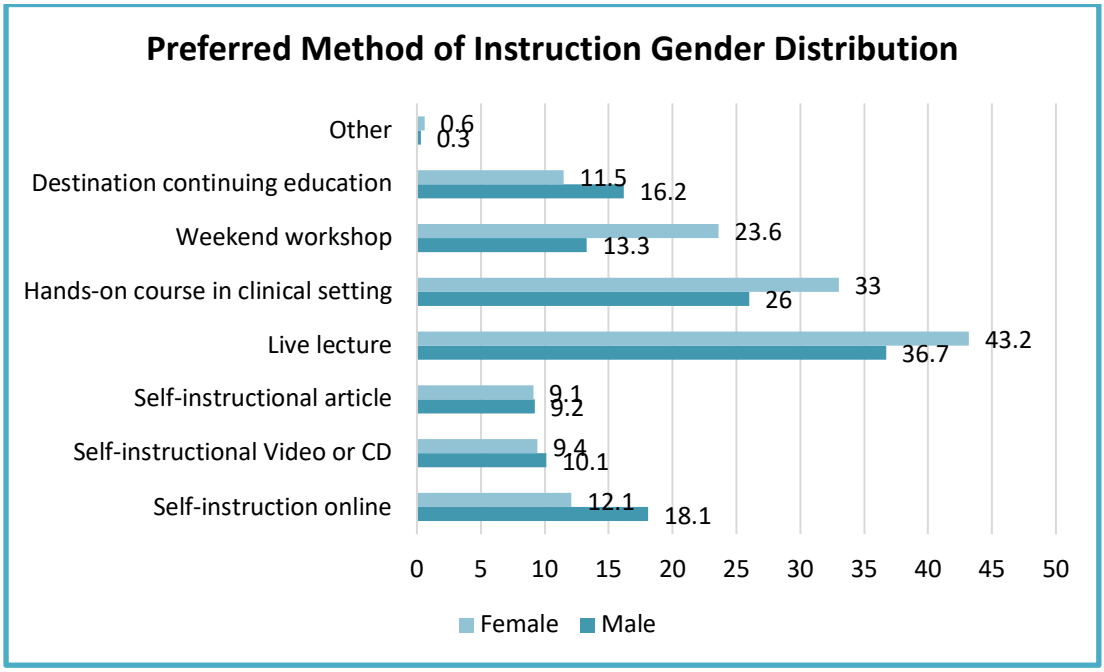
The gender-wise distribution for the preferred method of instruction demonstrated the self-instruction online method and Hands-on course in clinical setting to be statistically

significant($p<0.05$) and weekend workshop to be highly statistically significant($p<0.001$). (Table 14, Figure 16)

Table 14: Gender-wise distribution of preferred method of Instruction

Preferred Method of Instruction	Gender	Total N(%)	Chi-square value
Self-instruction online	Male (327)	59 (18.1)	**0.026***
	Female (373)	45(12.1)	
Self-instructional Video or CD	Male (327)	33(10.1)	0.752
	Female (373)	35(9.4)	
Self-instructional article	Male (327)	30(9.2)	0.978
	Female(373)	35(9.1)	
Live lecture	Male (327)	120(36.7)	0.082
	Female (373)	161(43.2)	
Hands-on course in clinical setting	Male (327)	85(26)	**0.044***
	Female (373)	123(33)	
Weekend workshop	Male (327)	43(13.3)	**0.000***
	Female (373)	88(23.6)	
Destination continuing education	Male (327)	53(16.2)	0.073
	Female (373)	43(11.5)	
Other (…….)	Male (327)	0(0)	0.185
	Female (373)	2(0.6)	

Figure 16: Gender-wise distribution of preferred method of Instruction



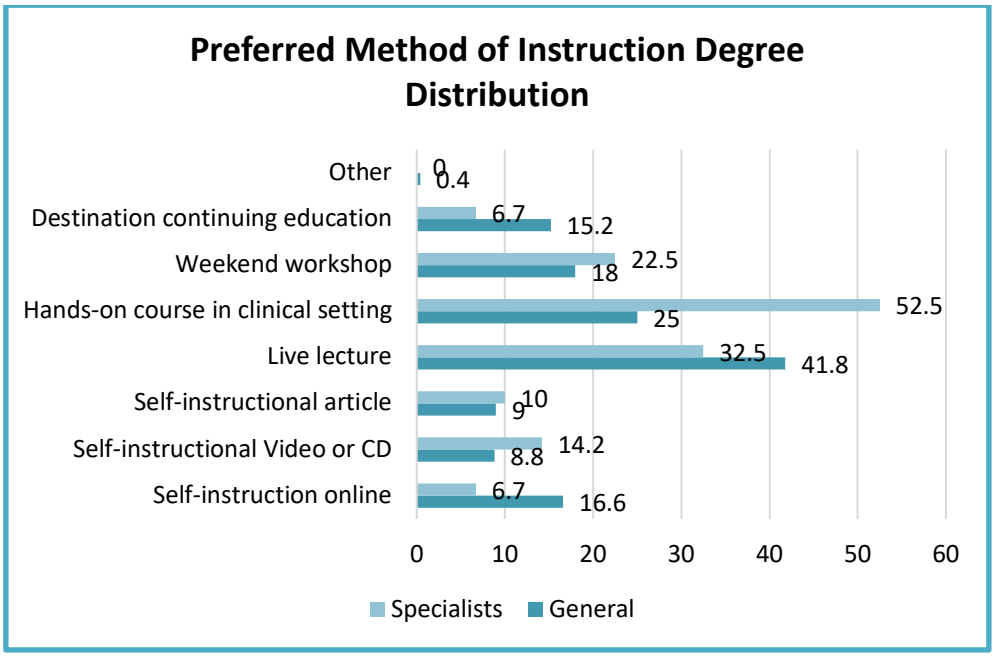
The preferred method of instruction was analyzed with Level of Degree as a parameter. The Self-instruction online method and Destination Continuing education program

were observed to be highly significant ($p<0.05$), while the Hands-on course in clinical setting was seen to be highly significant ($p<0.001$). (Table 15)

Table 15: Level of Degree-wise distribution of preferred method of Instruction

Method of Instruction	Degree	Total N (%)	Chi-square value
Self-instruction online	General (580)	96(16.6)	**0.006***
	Specialist (120)	8(6.7)	
Self-instructional Video or CD	General (580)	51(8.8)	0.070
	Specialist (120)	17(14.2)	
Self-instructional article	General (580)	52(9)	0.720
	Specialist (120)	12(10)	
Live lecture	General (580)	242(41.8)	0.061
	Specialist (120)	39(32.5)	
Hands-on course in clinical setting	General (580)	145(25)	**0.000***
	Specialist (120)	63(52.5)	
Weekend workshop	General (580)	104(18)	0.243
	Specialist (120)	27(22.5)	
Destination continuing education	General (580)	88(15.2)	**0.014***
	Specialist (120)	8(6.7)	
Other	General (580)	2(0.4)	0.519
	Specialist (120)	0(0)	

Figure 17: Level of Degree-wise distribution of preferred method of Instruction



4.8. Hindrances pursuing the continuing Dental Education association with Gender and Level of Degree

The difficulties and hindrances pursuing the Continuing Dental Education were asked under different heads.

Table 16: Hindrances in pursuing Continuing Dental Education

Hindrance	N (%)			
	Always	Frequently	Rarely	Never
Practice too busy	74(10.6)	418(59.7)	135(19.3)	73(10.4)
Timing of course	265(37.9)	248(35.4)	12818.3)	59(8.4)
Time needed to Travel	307(43.9)	186(26.6)	141(20.1)	66(9.4)
Time away from family	87(12.4)	133(19)	370(52.9)	110(15.7)
Loss of income	60(8.6)	136(19.4)	380(54.3)	124(17.7)
Cost of Course	103(14.7)	146(20.9)	373(53.3)	78(11.1)
Cost of Travel	124(17.7)	130(18.6)	343(49)	103(14.7)
Lack of computer hardware/software	38(5.4)	256(36.6)	139(19.9)	267(38.1)
Lack of Computer literacy	30(4.3)	82(11.7)	163(23.3)	425(60.7)
Lack of access to health sciences libraries	182(26)	95(13.6)	148(21.1)	275(39.3)
Lack of Local courses	61(8.7)	105(15)	240(34.3)	294(42)

Figure 18: Graphical representation showing Hindrances in pursuing Continuing Dental Education

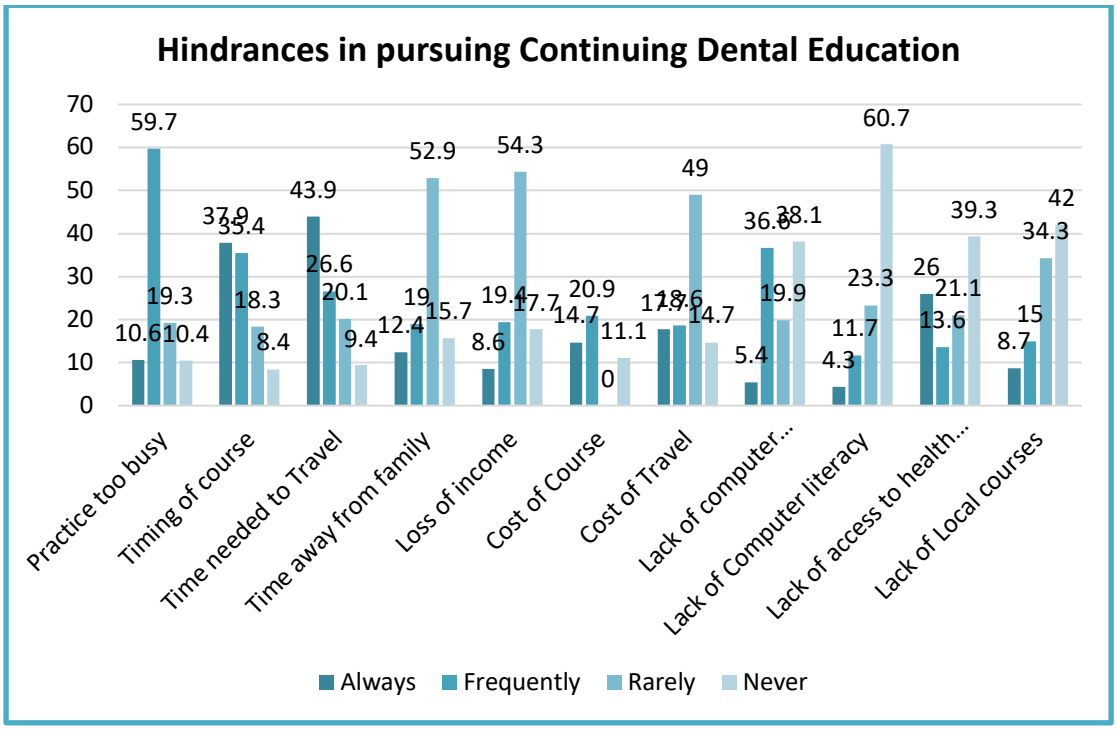


Table 17: Gender-wise distribution of hindrances in pursuing Continuing Dental Education

Hindrance	Gender	N(%)				Total	Chi-square value
		Always	Frequently	Rarely	Never	N(%)	
Practice too busy	Male	37(11.4)	213(65.1)	49(14.9)	28(8.6)	327 (100)	**0.010***
	Female	37(10)	205(54.9)	86(23)	45(12.1)	373 (100)	
Timing of course	Male	146(44.6)	106(32.4)	57(17.4)	18(5.5)	327 (100)	**0.001***
	Female	119(31.9)	142(38)	71(19.1)	41(11)	373 (100)	
Time needed to Travel	Male	151(46.2)	91(27.8)	60(18.3)	25(7.7)	327 (100)	0.244
	Female	156(41.9)	95(25.4)	81(21.8)	41(10.9)	373 (100)	
Time away from family	Male	22(6.7)	65(19.9)	194(59.3)	46(14.1)	327 (100)	**0.000***
	Female	65(17.4)	68(18.2)	176(47.2)	64(17.2)	373 (100)	
Loss of income	Male	20(6.2)	50(15.2)	196(60)	61(18.6)	327 (100)	**0.003***
	Female	40(10.7)	86(23.1)	184(49.3)	63(16.9)	373 (100)	
Cost of Course	Male	32(9.8)	61(18.7)	196(59.9)	38(11.6)	327 (100)	**0.001***

	Female	71(19.1)	85(22.8)	177(47.4)	40(10.7)	373 (100)	
Cost of Travel	Male	48(14.7)	56(17.1)	176(53.8)	47(14.4)	327 (100)	0.077
	Female	76(20.4)	74(19.8)	167(44.8)	56(15)	373 (100)	
Lack of comp. hardware/software	Male	17(5.2)	133(40.7)	54(16.5)	123(37.6)	327 (100)	0.094
	Female	21(5.6)	123(33)	85(22.8)	144(38.6)	373 (100)	
Lack of Computer literacy	Male	12(3.7)	40(12.2)	64(19.6)	211(64.5)	327 (100)	0.122
	Female	18(4.8)	42(11.2)	99(26.6)	214(57.4)	373 (100)	
Lack of access to health sciences lib.	Male	73(22.4)	35(10.6)	62(19)	157(48)	327 (100)	**0.000***
	Female	109(29.2)	60(16.1)	86(23.1)	118(31.6)	373 (100)	
Lack of Local courses	Male	26(7.9)	46(14.1)	96(29.4)	159(48.6)	327 (100)	**0.009***
	Female	35(9.4)	59(15.8)	144(38.6)	135(36.2)	373 (100)	

Table 18: Level of Degree-wise distribution of hindrances in pursuing Continuing Dental Education

Hindrance	Degree	N(%)				Total	Chi-square value
		Always	Frequently	Rarely	Never	N(%)	
Practice too busy	General	61(10.5)	350(60.4)	104(17.9)	65(11.2)	580(100)	0.144
	Specialist	13(10.8)	68(56.7)	31(25.8)	8(6.7)	120(100)	
Timing of course	General	254(43.8)	185(31.9)	92(15.9)	49(8.4)	580(100)	**0.000***
	Specialist	11(9.2)	63(52.5)	36(30)	10(8.3)	120(100)	
Time needed to Travel	General	289(49.8)	137(23.6)	97(16.8)	57(9.8)	580(100)	**0.000***
	Specialist	18(15)	49(40.8)	44(36.7)	9(7.5)	120(100)	
Time away from family	General	77(13.3)	93(16.1)	320(55.2)	90(15.5)	580(100)	**0.000***
	Specialist	10(8.3)	40(33.3)	50(41.7)	20(16.7)	120(100)	
Loss of income	General	48(8.3)	108(18.7)	331(57)	93(16)	580(100)	**0.008***
	Specialist	12(10)	28(23.4)	49(40.8)	31(21.8)	120(100)	
Cost of Course	General	90(15.5)	113(19.5)	321(55.3)	56(9.7)	580(100)	**0.003***
	Specialist	13(10.8)	33(27.6)	52(43.3)	22(18.3)	120(100)	
Cost of Travel	General	104(17.9)	99(17.1)	296(51.1)	81(13.9)	580(100)	**0.039***
	Specialist	20(16.7)	31(25.8)	47(39.1)	22(18.3)	120(100)	
Lack of comp. hardware/software	General	33(5.7)	239(41.2)	112(19.3)	196(33.8)	580(100)	**0.000***
	Specialist	5(4.2)	17(14.2)	27(22.5)	71(59.7)	120(100)	
Lack of Computer literacy	General	26(4.5)	67(11.6)	137(23.6)	350(60.3)	580(100)	0.891
	Specialist	4(3.3)	15(12.5)	26(21.7)	75(62.5)	120(100)	
Lack of access to health sciences lib.	General	160(27.6)	71(12.2)	110(19)	239(41.2)	580(100)	**0.000***
	Specialist	22(18.3)	24(20)	38(31.7)	36(30)	120(100)	
Lack of Local courses	General	47(8.1)	77(13.3)	190(32.7)	266(45.9)	580(100)	**0.000***
	Specialist	14(11.7)	28(23.3)	50(41.7)	28(23.3)	120(100)	

The 418 (59.7%) participants felt that **too busy practice** was the frequent reason for not been able to attend CDE programs. Out of this, 213 were males and 205 were females. In contrast 135 participants (19.3%) which included 49 males and 86 females, felt this was rarely a reason and only 73 (10.4%) participants with 28 males and 45 females, felt that the busy practice was never a reason for not attending CDE programs. The 74 (10.6%) participants felt this was always a reason not to attend the CDEs. Out

these 74 participants 37 were males and equal number were females. The chi/square test of association was carried out to analyse whether this reason of too busy practice is associated with gender. The analysis shows the very significant ($p<0.01$) association between busy practice and the gender of the respondents. (Table 16, Table 17, Figure 18)

When the same parameter of busy practice was analysed taking the type of practitioners into consideration, 61 general dentists and 13 specialists told that this was always a reason for not attending courses. 350 general practitioners and 68 specialists felt that too busy practice was a frequent reason, while 104 general practitioners and 31 specialists felt it as a rare reason. The 65 general practitioners and 8 specialists felt that this was never a reason. (Table 18)

When asked about the **timings of the course** as a hindrance for attending CDEs, 265 (37.9%) participants felt it is always a reason while 248 (35.4%) felt is as a frequent reason for not been able to attend CDE programs. Only 59 (8.4%) felt that the timing of the course is never an obstacle in professional development. Among the 265 participants who felt timing of the course was always a hindrance, 146 were males and 119 were females whereas 254 were general practitioners and 11 were specialists. While the practitioners who felt this as a frequent hindrance, 106 were males and 142 females while 185 were general dentists and 63 were specialists. The 57 males and 71 females considered timing was rarely a hindrance, while 18 males and 41 females felt this was never a hindrance. The 92 general dentists and 36 specialists felt this as a rare cause of hindrance in professional development. The practitioners who felt that timing was never a hindrance comprised of 49 general practitioners and 10 specialists. The analysis shows that there is a very highly significant association($p<0.001$) between the

timings of the course and the gender of the respondents as well as the level of degree. (Table 16, Table 17, Table 18, Figure 18)

The **time needed to travel** for the course was always a hindrance for 307 (34.9%) participants among which 151 were males and 156 females, while 186(26.6%), 141(20.1%) and 66(9.4%) felt this as the frequent, rare and never a hindrance, respectively, in attending the professional development programs. The 91 males and 95 females felt travelling time was frequently a hindrance, while 60 males and 81 females felt this was rarely a hindrance. Only 25 males and 41 females felt this was never a hindrance. When the same question was analysed based on the type of practice, 289 general practitioners and 18 specialists felt that this was always a problem. The 137 general dentists and 49 specialists felt that this was a frequent hindrance. On the contrary 97 general dentists and 44 specialists opined this was rarely a hindrance and 57 general dentists and 9 specialists felt that this was never the hindrance.The analysis shows statistically non-significant association for the above-mentioned reason and the gender of respondents, but very highly significant ($p<0.001$) association with level of degree of practitioners. (Table 16, Table 17, Table 18, Figure 18)

The participants were asked about the **time** they have to take **away from the family**. Out of the 700 participants, 87(12.4%) felt it as always a reason, 133(19%) as frequent and 110 (15.7%) as never a reason for not been able to attend CDE programs. 370 (52.9%) participants responded this as rarely as hindrance in professional development. The gender-wise distribution in this question regarding time away from family showed 22 males and 65 females felt this was always a hindrance, 65 males and 68 females felt this was frequently a hindrance, 194 males and 176 females opined this to be a rare hindrance and 46 males and 64 females felt this was never a hindrance. When this

question was analysed according to type of practice, the 77 General dentists responded as always a hindrance and 93 as frequent hindrance, while 320 general dentists told this was rarely a hindrance and 90 general dentists told this was never a hindrance. Among specialists 18 were of opinion that this was always a hindrance, 49 said that this was frequent hindrance, 44 specialists told that this was rarely a hindrance and 9 told that this was never a hindrance. The associations with both the parameters here were statistically very highly significant ($p<0.001$). (Table 16, Table 17, Table 18, Figure 18)

When asked about the **loss of income** in clinics due to unavailability while attending the programs, the 380 (54.3%) participants, which included 196 males and 185 females, felt it, as rarely been a valid reason. While 124(17.7%) responded it as never a hindrance, this 124 comprised of 61 males and 63 females. Only 60 (8.6%) participants with 20 males and 40 females, felt it as always a reason for not been able to attend the courses, while 136 (19.4%) comprised of 50 males and 86 females felt this been a frequent hindrance. 48 of the general practitioners were of the opinion that this was always a cause for the loss of income, 108 opined it was a frequent cause, 331 felt that loss of income was rarely a hindrance in attending the courses and 93 opined that this was never a hindrance. Among the specialists, 12 felt that this was always a cause, 28 felt that this was never a cause, 49 felt this was rarely a cause and 31 felt this was never a cause. The associations of gender and level of degree with loss of income as hindrance were statistically highly significant ($p<0.01$). (Table 16, Table 17, Table 18, Figure 18)

The participants were asked for **the costs involved in such professional development** programs. Majority of the participants responded to it as rarely (373/53.3%; 196 males and 177 females) a reason not to attend the CDE programs. While 78 (11.1%) participants comprising of 38 males and 40 females, felt it, as never been a hindrance.

Only 103 (14.7%) with 32 males and 71 females and 146(20.9%) with 61 males and 85 females felt this to be always and frequent reason respectively for hindrance in attending CDE programs. The 90 general practitioners and 12 specialists felt that costs involved in the courses were always a reason not to attend the programs. The 113 general dentists and 33 speciality practitioners felt that this was a frequent hindrance on attending CPD programs. The majority of 321 general dentists and 52 specialists felt that this was rarely a hindrance. The 56 general practitioners and 22 specialists felt that this was never a reason for not attending courses. The associations of gender and level of degree with cost of course were statistically highly significant ($p<0.01$). (Table 16, Table 17, Table 18, Figure 18)

In continuing with the financial aspects as hindrance for professional development, the next question asked for **the costs involved in travelling to the location of course**. Out of the total respondents, 48 males and 76 females (124 / 17.7%) felt this to be a hindrance always, 56 male participants and 74 female participants (130 / 18.6%) frequently and 47 male and 56 females participants (103 / 14.7%) never a hindrance. Close to half of the respondents comprising of 176 males and 167 females (343/49%) opined this as a rare cause of any hindrance in attending professional development. Among the general practitioners, 104 felt that this was always a hindrance, 99 felt that this was a frequent hindrance, 296 felt that this was rarely a hindrance and 81 felt that this was never a hindrance. The 20 specialists felt that a cost involved in traveling was always a hindrance, while 31 felt that this was a frequent hindrance. The 47 specialists felt that this was rarely a hindrance and 22 specialists felt that this was never a hindrance. This association of level of degree with cost of travel for course was statistically highly significant ($p<0.01$). (Table 16, Table 17, Table 18, Figure 18)

Since ICT plays an important role in many of the professional development courses, especially online courses, webinars, live demonstration of various procedures, the next question enquired regarding the **lack of appropriate computer hardware or software** as a hindrance for professional development. Very small number of participants (38/5.4%) responded this being a hindrance always, among whom 17 were males and 21 were females. While 256 (36.6%) participants with 133 males and 123 females felt this being the frequent hindrance in professional development, 267(38.1%) participants with 123 males and 144 females felt this was never a hindrance and 139(19.9%) participants with 54 males and 85 females felt this to be rarely a hindrance. The 33 general dentists felt that this was always a hindrance, 239 opined that this was a frequent hindrance, 112 general dentists felt that this was rarely a hindrance and 196 felt that this was never a hindrance. Among the specialists, 5 participants told that this was always a hindrance, 17 felt that this was a frequent hindrance, 112 felt that this was rarely a hindrance and 196 felt that this was never a hindrance. This association of level of degree with cost of travel for course was very highly significant ($p<0.001$). (Table 16, Table 17, Table 18, Figure 18)

In continuation with the same, the next question asked about the **lack of Computer literacy** as a hindrance, to which 30(4.3%) responded as always, 82(11.7%) as frequently, 163(23.3%) as rarely and the majority of 425(60.7%) as never the hindrance. Out of 30 who responded as always 12 were males and 18 were females. Out of 82 who responded as frequently 40 were males and 42 were females. The 163 participants who felt this as a rarely a hindrance comprised of 64 males and 84 females, while 211 males and 214 females making it to the total of 425 felt this was never a hindrance. When this question was analyzed for the type of practitioners and their response, 26 general practitioners and 4 specialists responded that lack of computer

literacy was always a hindrance, 67 general practitioners and 15 specialists responded it as a frequent hindrance, while 137 general dentists and 26 specialists felt this was rarely a hindrance and 350 general practitioners and 75 specialists felt this was never a hindrance. Both the associations were not statistically significant.

One of the main pillars in the clinical practice, especially Evidence-based clinical practice is **access to the health sciences libraries**. 182(26%) participants comprising of 73 male and 109 females felt this to be always a problem in professional development, while 95(13.6%) participants including 35 males and 60 females felt this to be a frequent problem. On the contrary 148(21.1%) respondents, among whom 62 were males and 86 females, felt this is rarely a problem. While 275(39.3%) participants responded this was never a hindrance in professional development, which comprised of 157 males and 118 females. Among the general dental practitioners, 160 felt this as a hindrance always, 71 felt this was a frequent hindrance, 110 opined this to be a rare hindrance and 239 felt that this was never a hindrance. The 22 specialists felt that this was always a hindrance, 24 felt that this was a frequent hindrance, 38 felt that this was rarely a hindrance and 36 felt that this was never a hindrance. This associations of gender and level of degree with lack of access for course were very highly significant ($p<0.001$). (Table 16, Table 17, Table 18, Figure 18)

The last question about the hindrances in pursuing the professional development was regarding the **unavailability of the local courses**. The 61(8.7%) participants comprising of 26 males and 35 females felt this was always a problem and 105(15%) participants comprising of 46 males and 59 females felt this as a frequent problem. The 240 (34.3%) participants comprised of 96 males and 144 females opined this rarely been a hindrance, while 294(42%) participants with 159 male and 135 female felt this

was never a hindrance. The 47 general practitioners and 14 specialists felt that this was always a hindrance, 77 general dentists and 28 specialists felt that this was a frequent hindrance, 190 general practitioners and 50 specialists felt that this was a rare hindrance and 266 general practitioners and 28 specialists felt that this was never a hindrance. Here the association of gender was highly significant($p<0.01$) and level of degree was very highly significant ($p<0.001$).

Table 19: Hindrances in pursuing Continuing Dental Education with hours of CDE attended

Hindrance	Hours of CDE	N(%)				Total	Chi-square value
		Always	Frequently	Rarely	Never	N(%)	
Practice too busy	0-10	37(11.5)	162(50.3)	72(22.4)	51(15.8)	322(100)	**0.000***
	11-20	25(9.8)	195(76.5)	26(10.2)	9(3.5)	255(100)	
	21-35	10(14.3)	34(48.6)	19(27.1)	7(10)	70(100)	
	35+	2(3.8)	27(50.9)	18(34)	6(11.3)	53(100)	
Timing of course	0-10	93(28.9)	124(38.5)	72(22.4)	33(10.2)	322(100)	**0.000***
	11-20	155(60.8)	60(23.5)	33(12.9)	7(2.7)	255(100)	
	21-35	11(15.7)	39(55.7)	12(17.1)	8(11.5)	70(100)	
	35+	6(11.3)	25(47.1)	11(20.7)	11(20.7)	53(100)	
Time needed to Travel	0-10	114(35.4)	88(27.3)	81(25.1)	39(12.2)	322(100)	**0.000***
	11-20	166(65.1)	47(18.4)	32(12.5)	10(3.9)	255(100)	
	21-35	12(17.2)	33(47.1)	12(17.2)	13(18.5)	70(100)	
	35+	15(28.3)	18(34)	16(30.2)	4(7.5)	53(100)	
Time away from family	0-10	47(14.6)	63(19.6)	152(47.2)	60(18.6)	322(100)	**0.000***
	11-20	23(9.1)	33(12.9)	179(70.2)	20(7.8)	255(100)	
	21-35	9(12.8)	21(30)	23(32.9)	17(24.3)	70(100)	
	35+	8(15.1)	16(30.2)	16(30.2)	13(24.5)	53(100)	
	0-10	33(10.2)	71(22.1)	167(51.9)	51(15.8)	322(100)	**0.000***

Loss of income	11-20	14(5.5)	35(13.7)	176(69.1)	30(11.7)	255(100)	
	21-35	7(10)	22(31.4)	26(37.1)	15(21.4)	70(100)	
	35+	6(11.3)	8(15.1)	11(20.8)	28(52.8)	53(100)	
Cost of Course	0-10	61(18.9)	75(23.3)	158(40.1)	28(8.7)	322(100)	**0.000**
	11-20	19(7.5)	31(12.1)	181(71)	24(9.4)	255(100)	
	21-35	9(12.8)	28(40)	23(32.9)	10(14.3)	70(100)	
	35+	14(26.4)	12(22.6)	11(20.8)	16(30.2)	53(100)	
Cost of Travel	0-10	68(21.1)	67(20.8)	142(44.1)	45(14)	322(100)	**0.000***
	11-20	24(9.4)	35(13.7)	168(65.9)	28(11)	255(100)	
	21-35	15(21.4)	21(30)	18(25.7)	16(22.9)	70(100)	
	35+	17(32.1)	7(13.2)	15(28.3)	14(26.4)	53(100)	
Lack of comp. hardware/software	0-10	22(6.9)	84(26.1)	74(23)	142(45)	322(100)	**0.000***
	11-20	8(3.2)	153(60)	37(14.5)	57(22.3)	255(100)	
	21-35	6(8.6)	13(18.6)	22(31.4)	29(41.4)	70(100)	
	35+	2(3.8)	6(11.3)	6(11.3)	39(73.6)	53(100)	
Lack of Computer literacy	0-10	13(4.1)	32(9.9)	87(27)	190(59)	322(100)	**0.000***
	11-20	9(3.5)	33(12.9)	36(14.1)	177(69.4)	255(100)	
	21-35	6(8.6)	10(14.3)	28(40)	26(37.1)	70(100)	
	35+	2(3.8)	7(13.2)	12(22.6)	32(60.4)	53(100)	
Lack of access to health sciences lib.	0-10	80(24.8)	52(16.1)	78(24.2)	112(34.8)	322(100)	**0.000***
	11-20	65(25.4)	26(10.2)	33(12.9)	131(51.4)	255(100)	
	21-35	17(24.3)	12(17.2)	26(37.1)	15(21.4)	70(100)	
	35+	20(37.8)	5(9.4)	11(20.7)	17(32.1)	53(100)	
Lack of Local courses	0-10	32(9.9)	47(14.6)	133(41.3)	110(34.2)	322(100)	**0.000***
	11-20	18(7.1)	31(12.2)	49(19.2)	157(61.6)	255(100)	
	21-35	9(12.8)	17(24.3)	35(50)	9(12.9)	70(100)	
	35+	2(3.8)	10(18.8)	23(43.4)	18(34)	53(100)	

The **hours of the professional development courses** attended by the practitioners will be influenced by various hindrances faced by them. The hindrance of **busy practice** in not attending CDEs was first analyzed. Among the practitioners who attended the professional courses for 0-10 hours, 37 felt that busy practice was always a hindrance, 162 felt that this was a frequent hindrance, 72 felt this was rarely a hindrance and 51 felt that this was never a hindrance. The participants who had attended the courses for 11-20 hours felt that this was always a hindrance for 25, frequent hindrance for 195, rarely a hindrance for 26 and never a hindrance for 9. Out of 70 participants who had attended the CDEs for 21-35 hours, 10 felt this was always a hindrance, 34 felt that this was a frequent hindrance, 19 felt that this was rarely a hindrance and 7 felt that busy practice was never a hindrance. The participants who had attended the professional development courses for more than 35 hours felt that this was always a hindrance for 2 participants, frequent hindrance for 27, rarely a hindrance for 18 and never a hindrance for 6 practitioners. (Table 19)

The **timing of the continuing development course** has bearing on the attendance for that course. Hence the **hours of CDE** received was analyzed with timings of course. Among the participants who had received the professional development course for 0-10 hours, 93 felt that this was always a hindrance, 124 felt that this was a frequent hindrance, 72 felt that this was rarely a hindrance and 33 felt that this was never a hindrance. Out of the 255 participants who attended the CDEs for 11-20 hours, 155 felt that this was always a hindrance, 60 felt that this was a frequent hindrance, 33 felt that this was rarely a hindrance and 7 felt that this was never a hindrance. Among the participants who attended the CDE programs for 21-35 hours, 11 opined that this was always a hindrance, 39 felt that this was a frequent hindrance, 12 felt that this was rarely a hindrance and 8 felt that this was never a hindrance. The 53 participants who had

attended the CDE programs for more than 35 hours opined that timing was always a hindrance for 6, frequently a hindrance for 25, rarely a hindrance for 11 and never a hindrance for 11. (Table 19)

The continuing dental courses are held in different town and mostly in metros. Hence the **time needed to travel** was analyzed to have bearing on **hours of the CDE** program attended. Among the participants who had attended the courses for 0-10 hours, 114 felt that this was always a hindrance, 88 felt that this was a frequent hindrance, 81 felt that this was rarely a hindrance and 39 felt that this was never the hindrance. Out of 255 participants who attended the professional development courses for 11-20 hours, 166 felt that this was always a hindrance, 47 felt that this was a frequent hindrance, 32 felt that this was rarely a hindrance and 10 told that this was never a hindrance. The participants who attended the courses for 21-35 hours felt that this was always a hindrance for 12 participants, frequent hindrance for 33 participants, rarely a hindrance for 12 participants and never a hindrance for 13 participants. Among the 53 participants who attended the professional development programs for more than 35 hours, 15 felt that this was always a hindrance, 18 felt that this was a frequent hindrance, 16 felt that this was rarely a hindrance and 4 felt that this was never a hindrance. (Table 19)

The **time away from the family** while attending the professional development program was analysed in relation to the **hours of program** attended. Among the 322 participants who attended the professional development course for 0-10 hours, 47 felt that this was always a hindrance, 63 felt that this was a frequent hindrance, 152 felt that this was rarely a hindrance and 60 felt that this was never a hindrance. Out of the 255 participants who attended the courses for 11-20 hours, 23 were of the opinion that this was always a hindrance, 33 felt that this was a frequent hindrance, 179 felt that this was rarely a

hindrance and 20 felt that this was never a hindrance. Among the participants who attended the courses for 21-35 hours, 9 felt that the time away from the family is always a hindrance in attending the professional development courses, 21 felt that this was a frequent hindrance, 23 felt that this was rarely a hindrance and 17 felt that this was never a hindrance. Among the participants who attended the professional development courses for more than 35 hours, 8 felt that this was always a hindrance, 16 felt that this was a frequent hindrance, 16 felt that this was rarely a hindrance and 13 felt that this was never a hindrance. (Table 19)

The **loss of income** due to absence in the clinics was thought to be one of the hindrances for not attending the professional development programs. This was analyzed against the **hours of professional development programs** attended. Among the participants who had attended the courses for 0-10 hours, 33 felt that this was always a factor for not attending courses, 71 felt that this was a frequent problem, while 167 participants felt that this was rarely an issue and 51 felt that this was never an issue. Out of 255 participants who attended the CDEs for 11-20 hours, 14 felt that this was always a hindrance, 35 felt that this was a frequent hindrance, 176 felt that this was rarely a hindrance and 30 felt that this was never a hindrance. Among the participants who attended the professional development program for 21-35 hours, 7 felt that this was always a hindrance, 22 felt that this was a frequent problem, 26 felt that this was rarely a problem and 15 felt that this was never a problem. Out of the 53 participants who attended the professional development course for more than 35 hours, 6 felt that this was always a hindrance, 8 felt that this was a frequent hindrance, 11 felt that loss of income was rarely a hindrance and 28 felt that this was never the hindrance. (Table 19)

Next factor that was analyzed with **hours of CDEs** attended was the **cost of the course**. Here out of the participants who attended the course for 0-10 hours, the 61 participants answered that this was always a hindrance in attending the courses, 75 answered that this was a frequent hindrance, but 158 participants answered that this was rarely a hindrance and 28 felt that this was never a hindrance. Among the participant who attended the CDEs for 11-20 hours, 19 felt that this was always a hindrance, 31 felt that this was a frequent hindrance, 181 felt that this was a rare hindrance and 28 felt that this was never a hindrance. Among the participants who attended the professional development courses for 21-35 hours, 9 felt that this was always a hindrance, 28 felt that this was frequent hindrance, 23 felt that this was rarely a hindrance and 10 felt that this was never a hindrance. Among the participants who attended the CDEs for more than 35 hours, 14 felt this factor as always a hindrance, 12 felt this as a frequent hindrance, 11 felt this was rarely a hindrance and 16 felt that this was never a hindrance. (Table 19)

The **cost involved in travel** was analyzed with **hours of the CDEs** attended. Among the participants who attended the courses for 0-10 hours, 68 felt that this was always a hindrance, 67 felt that this was a frequent hindrance, 142 felt that this was rarely a hindrance and 45 felt that this was never a hindrance. Among the participants who attended the professional development courses for 11-20 hours, 24 felt that this was always a hindrance, 35 felt that this was a frequent hindrance, 168 felt that this was rarely a hindrance and 28 felt that this was never a hindrance. Out of the 70 participants who attended the professional development courses for 21-35 hours, 15 felt that this was always a hindrance, 21 felt that this was a frequent hindrance, 18 felt that this was rarely a hindrance and 16 felt that this was never a hindrance. Among the 53 participants who attended the professional development courses for more 35 hours, 17 felt that this

was always a hindrance, 7 felt that this was a frequent hindrance, 15 felt that this was rarely a hindrance and 14 felt that this was never a hindrance. (Table 19)

Later the analysis was done to check the **impact of lack of appropriate computer hardware or software** on **hours of the CDEs** attended. It was observed that among the 322 participants, who attended the professional development courses for 0-10 hours, 22 felt this as always a hindrance, 84 felt this as a frequent hindrance, 74 felt this as rarely a hindrance and 142 felt this as never a hindrance. Out of the participants who attended the professional development programs for 11-20 hours, 8 felt this was always a hindrance, 153 felt that this was a frequent hindrance, 37 felt this was rarely a hindrance and 57 felt that this was never a hindrance. Among the participants who attended the courses for 21-35 hours, 6 felt that this was always a hindrance, 13 felt that this was a frequent hindrance, 22 felt that this was rarely a hindrance and 29 felt that this was never a hindrance. Out of the 53 participants who attended the professional courses for more than 35 hours, 2 felt that this was always a hindrance, 6 felt that this was a frequent hindrance, 6 felt that this was rarely a hindrance and 39 felt that this was never a hindrance. (Table 19)

Later the hours of CDEs attended was analysed for the correlation with **the lack of computer literacy.** The 322 participants who attended the professional development courses for 0-10 hours responded with 13 saying it was always a hindrance, 32 saying that it was a frequent hindrance, 87 saying that it was rarely a hindrance and 190 saying that it was never the hindrance. Among the participants who attended the courses for 11-20 hours, 9 told that lack of computer literacy was always a hindrance, 33 told that this was a frequent hindrance, 36 told that this was rarely a hindrance and 177 told that this was never a hindrance. Out of 70 participants who attended the CDEs for 21-35

hours, 6 felt that this was always a hindrance, 10 felt that this was a frequent hindrance, 28 felt that this was rarely a hindrance and 26 felt that this was never a hindrance. Among the participants who attended the professional development courses for more than 35 hours, 2 felt that this was always a hindrance, 7 felt that this was a frequent hindrance, 12 felt that this was rarely a hindrance and 32 felt that this was never a hindrance. (Table 19)

The **lack of access to health sciences libraries** was analyzed according to the **hours of CDEs attended**. Here out of the 322 participants who attended the CDEs for 0-10 hours, 80 felt that this was always a hindrance, 52 felt that this was a frequent hindrance, 78 felt that this was rarely a hindrance and 112 felt that this was never a hindrance. Among the participants who attended the CDEs for 11-20 hours, 18 felt that this was always a hindrance, 31 felt that this was a frequent hindrance, 49 felt that this was a rare hindrance and 157 felt that this was never a hindrance. Among the participants who attended the CDEs for 21-35 hours, 9 felt that this was always a hindrance, 17 felt that this was a frequent hindrance, 35 felt that this was rarely a hindrance and 9 felt that this was never a hindrance. Out of the 53 participants who attended the CDEs for more than 35 hours, 2 felt that this was always a hindrance, 10 felt that this was a frequent hindrance, 23 felt that this was a rare hindrance and 18 felt that this was never a hindrance. (Table 19)

The **hours of continuing professional development programs** were analyzed with **lack of availability of local courses**. Out of the 322 participants who attended the courses for 0-10 hours, 32 told that it was always a hindrance, 47 told that this was a frequent hindrance, 133 told that this was rarely a hindrance and 110 told that this was never the hindrance. Among the participants who attended the CDEs for 11-20 hours,

18 told that this was always a hindrance, 31 told that this was frequently a hindrance, 49 told that this was rarely a hindrance and 157 told that this was never the hindrance. Out of the participants who attended the CDEs for 21-35 hours, 9 told that this was always a hindrance, 17 told that this was a frequent hindrance, 35 told that this was a rare hindrance and 9 told that this was never a hindrance. Among the participants who attended the courses for more than 35 hours, 2 said that this was always a hindrance, 10 felt that this was a frequent hindrance, 23 felt that this was rarely a hindrance and 18 felt that this was never a hindrance. (Table 17)

All the parameters considered as hindrance here were found to be very highly significant statistically. ($p<0.001$) (Table 19)

Table 20: Hindrances in pursuing Continuing Dental Education with Frequency of CDE attended

Hindrance	Frequency	N(%)				Total	Chi-square value
		Always	Frequently	Rarely	Never	N(%)	
Practice too busy	< 2 times	38(9.2)	277(66.9)	70(16.9)	29(7)	414(100)	**0.000***
	> 4 times	19(15.6)	67(54.9)	16(13.1)	20(16.4)	122(100)	
	2-4 times	17(10.2)	74(45.1)	49(29.9)	24(14.8)	164(100)	
Timing of course	< 2 times	208(50.2)	117(28.3)	62(15)	27(6.5)	414(100)	**0.000***
	> 4 times	33(27)	51(41.8)	33(27.1)	5(4.1)	122(100)	
	2-4 times	24(14.6)	80(48.8)	33(20.5)	27(16.5)	164(100)	
Time needed to Travel	< 2 times	235(56.8)	88(21.3)	59(14.2)	32(7.7)	414(100)	**0.000***
	> 4 times	38(31.1)	43(35.3)	35(28.7)	6(4.9)	122(100)	
	2-4 times	34(20.7)	55(33.5)	47(28.6)	28(17.1)	164(100)	
Time away from family	< 2 times	50(12.1)	63(15.2)	246(59.4)	55(13.3)	414(100)	**0.000***
	> 4 times	18(14.8)	36(29.5)	53(43.4)	15(12.3)	122(100)	

	2-4 times	19(11.6)	34(20.7)	71(43.3)	40(24.4)	164(100)	
Loss of income	< 2 times	33(8)	64(15.4)	259(62.6)	58(14)	414(100)	**0.000***
	> 4 times	11(9)	33(27.1)	53(43.4)	25(20.5)	122(100)	
	2-4 times	16(9.7)	39(23.8)	68(41.5)	41(25)	164(100)	
Cost of Course	< 2 times	58(14)	68(16.4)	255(61.6)	33(7.8)	414(100)	**0.000***
	> 4 times	15(12.3)	34(27.9)	53(43.4)	20(16.4)	122(100)	
	2-4 times	30(18.3)	44(26.8)	65(39.6)	25(15.2)	164(100)	
Cost of Travel	< 2 times	60(14.5)	72(17.4)	231(55.8)	51(12.3)	414(100)	**0.002***
	> 4 times	24(19.7)	26(21.3)	49(40.1)	23(18.9)	122(100)	
	2-4 times	40(24.4)	32(19.5)	63(38.4)	29(17.7)	164(100)	
Lack of comp. hardware/ software	< 2 times	19(4.6)	190(35.9)	58(14)	147(35.5)	414(100)	**0.000***
	> 4 times	8(6.5)	37(30.3)	33(27.1)	44(36.1)	122(100)	
	2-4 times	11(6.7)	29(17.7)	48(29.3)	76(46.3)	164(100)	
Lack of Computer literacy	< 2 times	18(4.3)	32(7.7)	69(16.6)	295(71.2)	414(100)	**0.000***
	> 4 times	6(4.9)	24(19.7)	42(34.4)	50(41)	122(100)	
	2-4 times	6(3.7)	26(15.8)	52(31.7)	80(48.8)	164(100)	
Lack of access to health sciences lib.	< 2 times	109(26.3)	51(12.3)	59(14.2)	195(47.1)	414(100)	**0.000***
	> 4 times	34(27.9)	23(18.9)	35(28.6)	30(24.6)	122(100)	
	2-4 times	39(23.8)	21(12.8)	54(32.9)	50(30.5)	164(100)	
Lack of Local courses	< 2 times	32(7.7)	48(11.6)	106(25.6)	228(55.1)	414(100)	**0.000***
	> 4 times	11(9)	21(17.2)	55(45.1)	35(28.7)	122(100)	
	2-4 times	18(11)	36(21.9)	79(48.2)	31(18.9)	164(100)	

The **Frequency of attending** the Continuing professional development programs is an important parameter to assess the hindrances as well as preferences in continuing professional development.

The parameter of **busy practice** as a hindrance in professional development was analysed with **frequency of CDEs** attended. There were 414 participants who attended the professional development courses for less than 2 times in a year, out of that 38 felt that this was always a hindrance, 277 felt that this was a frequent hindrance, 70 felt that this was a rare hindrance and 29 felt that this was never a hindrance. 164 participants had attended the courses for 2-4 times in a year and 17 participants in this group felt that this was always a hindrance, 74 felt that this was a frequent hindrance, 49 felt that this was a rare hindrance and 24 felt that this was never a hindrance. Among the 122 participants who attended the CDEs for more than 4 times a year, 19 felt that this was always a hindrance, 67 felt that this was a frequent hindrance, 16 felt that this was never the hindrance and 20 felt that this was never a hindrance. (Table 20)

The **timing of the professional development program** influences the **frequency** of the programs attended. Hence the **number of programs attended per year** was analysed with timings of course. Among the 414 participants who had attended the professional development program for less than 2 times in a year, 208 felt that this was always a hindrance, 117 felt that this was a frequent hindrance, 62 felt that this was rarely a hindrance and 27 felt that this was never a hindrance. Out of the 164 participants who attended the CDEs for 2-4 times per year, 24 felt that this was always a hindrance, 80 felt that this was a frequent hindrance, 33 felt that this was rarely a hindrance and 27 felt that this was never a hindrance. Among the 122 participants who attended the CDE programs for more than 4 times a year, 33 felt that this was always a hindrance, 51 said that this was a frequent hindrance, 33 felt that this was rarely a hindrance and 5 told that this was never a hindrance. (Table 20)

As the different professional development programs are held at different places the **time needed to travel** affects the **frequency of attending** the professional development programs. Among the 414 participants who had attended the courses for less than 2 times in a year, 235 opined that this was always a hindrance, 88 opined that this was a frequent hindrance, 59 felt that this was rarely a hindrance and 32 felt that this was never the hindrance. Out of 164 participants who attended the professional development courses for 2-4 times in a year, 34 felt that this was always a hindrance, 55 felt that this was a frequent hindrance, 47 felt that this was rarely a hindrance and 28 told that this was never a hindrance. Among the 122 participants who attended the courses for more than 4 times in a year, 38 felt that this was always a hindrance, 43 felt that this was a frequent hindrance, 35 participants told that this was rarely a hindrance and 6 told that this was never a hindrance. (Table 20)

The **time away from the family** while attending the professional development program was analysed in relation to the **frequency of the professional development programs** attended. Among the 414 participants who attended the professional development course for less than 2 times a year, 50 felt that this was always a hindrance, 63 felt that this was a frequent hindrance, 246 felt that this was rarely a hindrance and 55 felt that this was never a hindrance. Out of the 164 participants who attended the courses for 2-4 times a year, 19 felt that this was always a hindrance, 34 felt that this was a frequent hindrance, 71 felt that this was rarely a hindrance and 40 felt that this was never a hindrance. Among the participants who attended the courses for more than 4 times in a year, 18 felt that this is always a hindrance in attending the professional development courses, 36 felt that this was a frequent hindrance, 53 felt that this was rarely a hindrance and 15 felt that this was never a hindrance. (Table 20)

The time spent away from the clinic for attending the professional development programs leads to **loss of income** and hence was analyzed against the **frequency of professional development programs** attended. Among the 414 participants who had attended the courses for less than 2 times in a year, 33 felt that this was always a hindrance for not attending courses, 64 felt that this was a frequent hindrance, 259 participants felt that this was rarely a hindrance and 58 felt that this was never a hindrance. Out of 164 participants who attended the CDEs for 2-4 times in a year, 16 felt that this was always a hindrance, 39 felt that this was a frequent hindrance, 68 felt that this was rarely a hindrance and 41 felt that this was never a hindrance. Among the participants who attended the professional development program for more than 4 times in a year, 11 felt that this was always a hindrance, 33 felt that this was a frequent problem, 53 felt that this was rarely a problem and 25 felt that this was never a problem. (Table 20)

Next factor that was analyzed with **frequency of CDEs** attended was the **cost of the course**. Among the 414 participants who attended the course for less than 2 times in a year, the 58 participants felt that this was always a hindrance in attending the courses, 68 felt that this was a frequent hindrance, but 255 participants felt that this was rarely a hindrance and 33 felt that this was never a hindrance. Among the 164 participant who attended the CDEs for 2-4 times in a year, 30 felt that this was always a hindrance, 44 felt that this was a frequent hindrance, 65 felt that this was a rare hindrance and 25 felt that this was never a hindrance. Among the 122 participants who attended the professional development courses for more than 4 times a year, 15 felt that this was always a hindrance, 34 felt that this was frequent hindrance, 53 felt that this was rarely a hindrance and 20 felt that this was never a hindrance. (Table 20)

The **cost of travel** for attending the professional development programs was analysed with **the frequency of professional development programs** attended. Among the 414 participants who attended the courses for less than 2 times in a year, 60 felt that this was always a hindrance, 72 felt that this was a frequent hindrance, 231 felt that this was rarely a hindrance and 51 felt that this was never a hindrance. Among the 164 participants who attended the professional development courses for 2-4 times in a year, 40 felt that this was always a hindrance, 32 felt that this was a frequent hindrance, 63 felt that this was rarely a hindrance and 29 felt that this was never a hindrance. Out of the 122 participants who attended the professional development courses for more than 4 times in a year, 24 felt that this was always a hindrance, 26 felt that this was a frequent hindrance, 49 felt that this was rarely a hindrance and 23 felt that this was never a hindrance. (Table 20)

The analysis was done to check the **impact of lack of appropriate computer hardware or software** on **frequency of the CDEs** attended. It was observed that among the 414 participants, who attended the professional development courses for less than 2 times in a year, 19 felt this as always a hindrance, 190 felt this as a frequent hindrance, 58 felt this as rarely a hindrance and 147 felt this was never a hindrance. Out of the 164 participants who attended the professional development programs for 2-4 times in a year, 11 felt this was always a hindrance, 29 felt that this was a frequent hindrance, 48 felt this was rarely a hindrance and 76 felt that this was never a hindrance. Among the 122 participants who attended the courses for more than 4 times in a year, 8 felt that this was always a hindrance, 37 felt that this was a frequent hindrance, 33 felt that this was rarely a hindrance and 44 felt that this was never a hindrance. (Table 20)

Next the **frequency of CDEs attended** was analysed for the correlation with the **lack of computer literacy**. The 414 participants who attended the professional development courses for less than 2 times in a year, responded with 18 saying it was always a hindrance, 32 saying that it was a frequent hindrance, 69 saying that it was rarely a hindrance and 294 saying that it was never the hindrance. Among the participants who attended the courses for 2-4 times in a year, 6 told that lack of computer literacy was always a hindrance, 26 told that this was a frequent hindrance, 52 told that this was rarely a hindrance and 80 told that this was never a hindrance. Out of 122 participants who attended the CDEs for more than 4 times in a year, 6 felt that this was always a hindrance, 24 felt that this was a frequent hindrance, 42 felt that this was rarely a hindrance and 59 felt that this was never a hindrance. (Table 20)

The **lack of access to health sciences libraries** was analysed in relation to the frequency of the professional development. Here out of the 414 participants who attended the CDEs for less than 2 time in a year, 109 felt that this was always a hindrance, 51 felt that this was a frequent hindrance, 59 felt that this was rarely a hindrance and 195 felt that this was never a hindrance. Among the 164 participants who attended the CDEs for 2-4 times in a year, 39 felt that this was always a hindrance, 21 felt that this was a frequent hindrance, 54 felt that this was a rare hindrance and 50 felt that this was never a hindrance. Among the 122 participants who attended the CDEs for more than 4 times in a year, 34 felt that this was always a hindrance, 23 felt that this was a frequent hindrance, 35 felt that this was rarely a hindrance and 30 felt that this was never a hindrance. (Table 20)

The **frequency of the CDE programs attended** was analysed with **lack of availability of local courses**. Out of the 414 participants who attended the courses for

less than 2 times in a year, 32 told that it was always a hindrance, 48 told that this was a frequent hindrance, 106 told that this was rarely a hindrance and 228 told that this was never the hindrance. Among the 164 participants who attended the CDEs for 2-4 times in a year, 18 told that this was always a hindrance, 36 told that this was frequently a hindrance, 79 told that this was rarely a hindrance and 31 told that this was never the hindrance. Out of the 122 participants who attended the CDEs for more than 4 times in a year, 11 told that this was always a hindrance, 21 told that this was a frequent hindrance, 55 told that this was a rare hindrance and 35 told that this was never a hindrance. (Table 20)

The association of frequency of CDE attended with all the factors considered as hindrance here were found to be very highly significant statistically. ($p<0.001$) (Table 18)

4.9. Preferred timings to attend

The next set of questions enquired about the **preferred timings** to attend the live continuing dental education course.

Table 21: Preferred timing to attend Live CDE courses

Preferred Timing	N(%)		
	Not Preferred	Moderately Preferred	Most Preferred
Weekdays Breakfast	488(69.7)	133(19)	79(11.3)
Weekdays Lunch time	476(68)	144(20.6)	80(11.4)
Weekdays Evening time	166(23.7)	359(51.3)	175(25)
Weekends	196(28)	120(17.1)	384(54.9)
Holidays	141(20.1)	159(22.7)	400(57.1)

Figure 19: Preferred timing to attend Live CDE courses

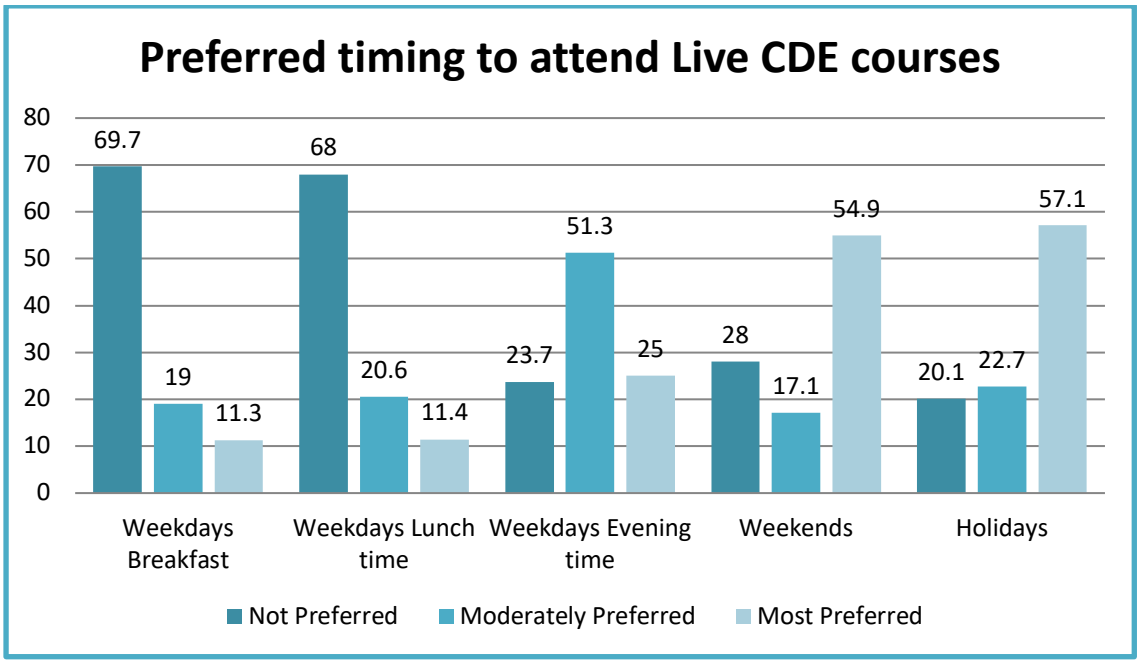


Table 22: Gender-wise distribution of preferred timing to attend Live CDE courses

Preferred Timing	Gender	N(%)			Total	Chi-square value
		Not Preferred	Moderately Preferred	Most Preferred	N(%)	
Weekdays Breakfast	Male	240(73.4)	54(16.5)	33(10.1)	327 (100)	0.138
	Female	248(66.5)	79(21.2)	46(12.3)	373 (100)	
Weekdays Lunch time	Male	234(71.5)	61(18.7)	32(9.8)	327 (100)	0.158
	Female	242(64.8)	83(22.3)	48(12.9)	373 (100)	
Weekdays Evening time	Male	72(22)	173(52.9)	82(25.1)	327 (100)	0.589
	Female	94(25.2)	186(49.9)	93(24.9)	373 (100)	
Weekends	Male	98(29.9)	46(14.1)	183(56)	327 (100)	0.112
	Female	98(26.3)	74(19.8)	201(53.9)	373 (100)	
Holidays	Male	65(19.9)	68(20.8)	194(59.3)	327 (100)	0.466
	Female	76(20.4)	91(24.4)	206(55.2)	373 (100)	

Table 23: Level of Degree-wise distribution of preferred timing to attend Live CDE courses

Preferred Timing	Degree	N(%)			Total	Chi-square value
		Not Preferred	Moderately Preferred	Most Preferred	N(%)	
Weekdays Breakfast	General	410(70.6)	106(18.3)	64(11.1)	580(100)	0.453
	Specialist	78(65)	27(22.5)	15(12.5)	120(100)	
Weekdays Lunch time	General	399(68.7)	116(20.1)	65(11.2)	580(100)	0.608
	Specialist	77(64.1)	28(23.3)	15(12.5)	120(100)	
Weekdays Evening time	General	130(22.4)	297(51.2)	153(26.4)	580(100)	0.082
	Specialist	36(30)	62(51.7)	22(18.3)	120(100)	
Weekends	General	172(29.6)	91(15.7)	317(54.7)	580(100)	**0.023***
	Specialist	24(20)	29(24.2)	67(55.8)	120(100)	
Holidays	General	104(17.9)	138(23.8)	338(58.3)	580(100)	**0.005***
	Specialist	37(30.8)	21(17.5)	62(51.7)	120(100)	

The **Weekdays breakfast** timings was not a preferable time for 488(69.7%) participants, moderately preferred for 133(19%) participants and most preferred for 79(11.3%). The 488 participants who did not prefer this timing comprised of 240 males and 248 females. The participants who moderately preferred this timing were 54 males and 79 females. The 33 male participants and 46 female participants felt this to be most preferred timing. The 410 general dentists and 78 specialists told this is not the preferred timing, 106 general dentists and 27 specialists moderately preferred this timing and 64 general dentists and 15 specialists opined this as a most preferred timing. (Table 21, Table 22, Table 23, Figure 19)

The **Weekdays lunch time** for professional development courses was not preferred by 476(68%) of the participants comprising of 234 males and 242 females, while 144(20.6%) participants comprising of 61 males and 83 females felt it to be moderately preferred. The 32 male participants and 48 female participants making it a total of 80(11.4%) felt it as most preferred. Among the general practitioners, 399 did to prefer this timing for professional development courses, 116 moderately preferred this time, while 65 participants rated this as the most preferred timing. Among the specialists 77 didn't prefer this as a suitable time for courses, 28 moderately preferred and 15 felt this as a most preferred timing.(Table 21, Table 22, Table 23, Figure 19)

When it came to the professional development courses during **evening time on Weekdays,** 166(23.7%) participants felt it to be not preferred, 359(51.3%) as moderately preferred and 175(25%) as most preferred. The gender-wise distribution showed 72 males and 94 females did not prefer this time, while 173 males and 186 females preferred this time moderately. The 82 males and 93 females felt this to be the most preferred timing. This was the most preferred timing for 153 general practitioners and 22 specialists, moderately preferred for 297 general dentists and 62 specialists and

not preferred for 130 general dentists and 36 specialists. (Table 21, Table 22, Table 23, Figure 19)

The **Weekends** turned out to be most preferred time for 384(54.9%) participants, followed by 196 (28%) as not preferred and 120(17.1%) as moderately preferred. The 183 male participants and 201 female participants felt weekends as the most preferred days for professional development. The participants who moderately preferred these timings comprised of 46 males and 74 females. The 98 males and 98 females did not prefer weekend as suitable for professional development courses. The 172 general practitioners and 24 specialists did not prefer this as a suitable time for professional development, 91 general practitioners and 29 specialists moderately preferred this timing, and for 317 general practitioners and 67 specialists this was the most preferred timing. (Table 21, Table 22, Table 23, Figure 19)

The **holidays** were also similarly most preferred by majority of 400(57.1%) participants comprising of 194 males and 206 females, moderately preferred by 159(22.7%) participants comprising of 68 males and 91 females and not preferred by 141(20.1%) comprising of 65 males and 76 females. Among the general practitioners, 338 preferred this timing most, 138 moderately preferred this timing and 104 didn't prefer this timing. Among the specialists, 62 preferred this timing most, 21 moderately preferred this timing and 37 didn't prefer this day.(Table 21, Table 22, Table 23, Figure 19)

The analysis of preferred timing and gender of practitioners was non-significant, while the association of Weekends and Holidays as preferred timings with level of degree was statistically significant ($p<0.05$) and highly significant respectively ($p<0.01$). (Table 21, Table 22, Table 23, Figure 19)

The **hours of the CDE received** was analysed to check the impact of the preferred timing for the course.

Table 24: Preferred timing to attend Live CDE courses with hours of CDE attended.

Preferred Timing	Hours of CDE	N(%)			Total	Chi-square value
		Not Preferred	Moderately Preferred	Most Preferred	N(%)	
Weekdays Breakfast	0-10	209(64.9)	65(20.2)	48(14.9)	322(100)	**0.000***
	11-20	208(81.6)	26(10.2)	21(8.2)	255(100)	
	21-35	37(52.8)	26(37.2)	7(10)	70(100)	
	35+	34(64.1)	16(30.2)	3(5.7)	53(100)	
Weekdays Lunch time	0-10	191(59.3)	77(23.9)	54(16.8)	322(100)	**0.000***
	11-20	204(80)	38(14.9)	13(5.1)	255(100)	
	21-35	39(55.7)	23(32.9)	8(11.4)	70(100)	
	35+	42(79.3)	6(11.3)	5(9.4)	53(100)	
Weekdays Evening time	0-10	78(24.2)	161(50)	83(25.8)	322(100)	0.722
	11-20	57(22.4)	138(54.1)	60(23.5)	255(100)	
	21-35	20(28.6)	30(42.8)	20(28.6)	70(100)	
	35+	11(20.8)	30(56.6)	12(22.6)	53(100)	
Weekends	0-10	81(25.2)	62(19.2)	179(55.6)	322(100)	**0.000***
	11-20	100(39.2)	32(12.5)	123(48.2)	255(100)	
	21-35	11(15.8)	15(21.4)	44(62.8)	70(100)	
	35+	4(7.5)	11(20.8)	38(71.7)	53(100)	
Holidays	0-10	75(23.3)	78(46.2)	169(51.5)	322(100)	**0.000***
	11-20	37(14.5)	57(22.4)	161(63.1)	255(100)	
	21-35	19(27.2)	12(17.1)	39(55.7)	70(100)	
	35+	10(18.9)	12(22.6)	31(58.5)	53(100)	

488 participants out of whom 209 had attended CDEs for 0-10 hours, 208 for 11-20 hours, 37 for 21-35 hours and 34 for more than 35 hours did not prefer the **weekday breakfast**. 133 participants moderately preferred this timing, our of whom 65 attended

the courses for 0-10 hours, 26 for 11-20 hours, 26 for 21-35 hours and 16 for more than 35 hours. The weekday breakfast was the most preferred timing for only 79 participants out of whom, 48 had attended the courses for 0-10 hours, 21 for 11-20 hours, 7 for 21-35 hours and 3 for more than 35 hours. The hours of CDE attended had a very highly significant ($p<0.001$) association with weekday breakfast as preferred timing. (Table 24)

The professional development courses on **Weekdays lunch time** were not preferred by 476 participants, out of whom 191 had attended the professional development courses for 0-10 hours, 204 for 11-20 hours, 39 for 21-35 hours and 42 for more than 35 hours. 144 participants moderately preferred this timing, out of which 77 had attended the courses for 0-10 hours, 38 had attended the courses for 11-20 hours, 23 for 21-35 hours and 6 for more than 35 hours. The same time was most preferred by only 80 participants out of which 54 had attended the professional courses for 0-10 hours, 13 for 11-20 hours, 8 for 21-35 hours and 5 for more than 35 hours. This preferred timing had a very highly significant ($p<0.001$) association with hours of CDE attended. (Table 24)

The **weekday evening time** was moderately preferred by 359 participants, while 166 participants did not prefer this as a suitable time and 175 participants felt this was a most preferred time. Out of these 359 participants, 161 had attended the courses for 0-10 hours, 138 for 11-20 hours, 30 for 21-35 hours and 30 for more than 35 hours. Among the 166 participants who did not prefer this time, 78 had attended the CDE programs for 0-10 hours, 57 for 11-20 hours, 20 for 21-35 hours and 11 for more than 35 hours. Out of 175 participants who mostly preferred this timing, 83 had attended the professional development courses for 0-10 hours, 60 for 11-20 hours, 20 for 21-35 hours and 12 for more than 35 hours. (Table 21)

The professional education courses on the **weekends** were the most preferred as felt by 384 participants, moderately preferred by 120 participants and not preferred by 196 participants. Out of the 384 participants who answered this timing as most preferred, 179 had attended the professional development courses for 0-10 hours, 123 for 11-20 hours, 44 for 21-35 hours and 38 for more than 35 hours. Among the 120 participants who moderately preferred this timing, 62 had attended the courses for 0-10 hours, 32 for 11-20 hours, 15 for 21-35 hours and 11 for more than 35 hours. Among the 196 participants who did not prefer this timing, 81 had attended the professional development courses for more than 0-10 hours, 100 for 11-20 hours, 11 for 21-35 hours and 4 for more than 35 hours. This preferred timing had a very highly significant ($p<0.001$) association with hours of CDE attended. (Table 24)

The next timing that was analysed in relation to the hours of professional development programs attended was on **Holidays**. 400 participants felt this as the most preferred timing out of whom, 169 had attended the professional development courses for 0-10 hours, 161 for 11-20 hours, 39 for 21-35 hours and 31 for more than 35 hours. Holidays were moderately preferred by 159 participants, among which 78 participants had attended the professional development courses for 0-10 hours, 57 for 11-20 hours, 12 for 21-35 hours and 12 for more than 35 hours. 141 participants felt this was not a preferred timing, out which 75 had attended the professional development courses for 0-10 hours, 37 for 11-20 hours, 19 for 21-35 hours and 10 for more than 35 hours. This preferred timing had a very highly significant ($p<0.001$) association with hours of CDE attended. (Table 24)

The **frequency of the professional development courses received** was analysed to check the impact of the preferred **timing** for the course.

Table 25: Preferred timing to attend Live CDE courses with frequency of CDE attended.

Preferred Timing	Frequency of CDE	N(%)			Total	Chi-square value
		Not Preferred	Moderately Preferred	Most Preferred	N(%)	
Weekdays Breakfast	< 2 times	317(76.6)	64(15.4)	33(8)	414(100)	**0.000***
	> 4 times	72(59)	31(25.4)	19(15.6)	122(100)	
	2-4 times	99(60.4)	38(23.2)	27(16.4)	164(100)	
Weekdays Lunch time	< 2 times	310(74.8)	63(15.2)	41(10)	414(100)	**0.000***
	> 4 times	67(54.9)	40(32.7)	15(12.4)	122(100)	
	2-4 times	99(60.4)	41(25)	24(14.6)	164(100)	
Weekdays Evening time	< 2 times	84(20.3)	225(54.3)	105(25.3)	414(100)	0.123
	> 4 times	33(27.1)	59(48.4)	30(24.5)	122(100)	
	2-4 times	49(29.9)	75(45.7)	40(24.4)	164(100)	
Weekends	< 2 times	134(32.4)	56(13.5)	224(54.1)	414(100)	**0.004***
	> 4 times	24(19.7)	27(22.2)	71(58.1)	122(100)	
	2-4 times	38(23.2)	37(22.6)	89(54.2)	164(100)	
Holidays	< 2 times	48(11.6)	104(25.1)	262(63.3)	414(100)	**0.000***
	> 4 times	45(36.9)	29(23.7)	48(39.4)	122(100)	
	2-4 times	48(29.2)	26(15.8)	90(54.8)	164(100)	

The 476 participants, among whom 310 had attended CDEs for less than 2 times in a year, 99 for 2-4 times and 67 for more than 4 hours in a year, did not prefer the **weekday breakfast**. 144 participants moderately preferred this timing, out of which 63 attended the courses for less than 2 times, 41 for 2-4 times and 40 for more than 4 times. The weekday breakfast was the most preferred timing for only 80 participants out of whom, 41 had attended the courses for less than 2 times in a year, 24 for 2-4 times and 15 for

more than 4 times. This preferred timing had a very highly significant ($p<0.001$) association with frequency of CDE attended. (Table 25)

The professional development courses on **Weekdays lunch time** were not preferred by 476 participants, out of whom 310 had attended the professional development courses for less than 2 times, 99 for 2-4 times and 67 for more than 4 times in a year. 144 participants moderately preferred this timing, out of which 63 had attended the courses for less than 2 times in a day, 41 had attended the courses for 2-4 times and 40 for more than 4 times in a year. The same time was most preferred by only 80 participants out of which 41 had attended the professional courses for less than 2 times in a year, 24 for 2-4 times, and 15 for more than 4 times in a year. This preferred timing had a very highly significant ($p<0.001$) association with frequency of CDE attended. (Table 25)

The **weekday evening time** was moderately preferred by 359 participants, while 166 participants did not prefer this as a suitable time and 175 participants felt this was a most preferred time. Out of these 359 participants, 225 had attended the courses for less than 2 times, 75 for 2-4 times and 59 for more than 4 times in a year. Among the 166 participants who did not prefer this time, 84 had attended the CDE programs for less than 2 times a day, 49 for 2-4 times and 33 for more than 4 times a day. Out of 175 participants who mostly preferred this timing, 105 had attended the professional development courses for less than 2 times, 40 for 2-4 times and 30 for more than 4 times in a day. (Table 25)

The professional education courses on the **weekends** were the most preferred as felt by 384 participants, moderately preferred by 120 participants and not preferred by 196 participants. Out of the 384 participants who answered this timing as most preferred, 224 had attended the professional development courses for less than 2 times in a year,

89 for 2-4 times in a year and 71 for more than 4 times in a year. Among the 120 participants who moderately preferred this timing, 56 had attended the courses for less than 2 times in a year, 37 for 2-4 times and 27 for more than 4 times a year. Among the 196 participants who did not prefer this timing, 134 had attended the professional development courses for less than 2 times, 38 for 2-4 times and 24 for more than 4 times in a year. This preferred timing had a highly significant ($p<0.01$) association with frequency of CDE attended. (Table 25)

The next timing that was analysed in relation to the hours of professional development programs attended was on **Holidays**. 400 participants felt this as the most preferred timing out of whom, 262 had attended the professional development courses for less than 2 times a year, 90 for 2-4 times in a year and 48 for more than 4 times in a year. Holidays were moderately preferred by 159 participants, among which 104 participants had attended the professional development courses for less than 2 times in a year, 26 for 2-4 times in a year and 29 for more than 4 times in a year. 141 participants felt this was not a preferred timing, out which 48 had attended the professional development courses for less than 2 times in a year, 48 for 2-4 times in a year and 45 for more than 4 times in a year. This preferred timing had a very highly significant ($p<0.001$) association with frequency of CDE attended. (Table 25)

4.10. The Subject of Interest for Continuing Professional Development Program.

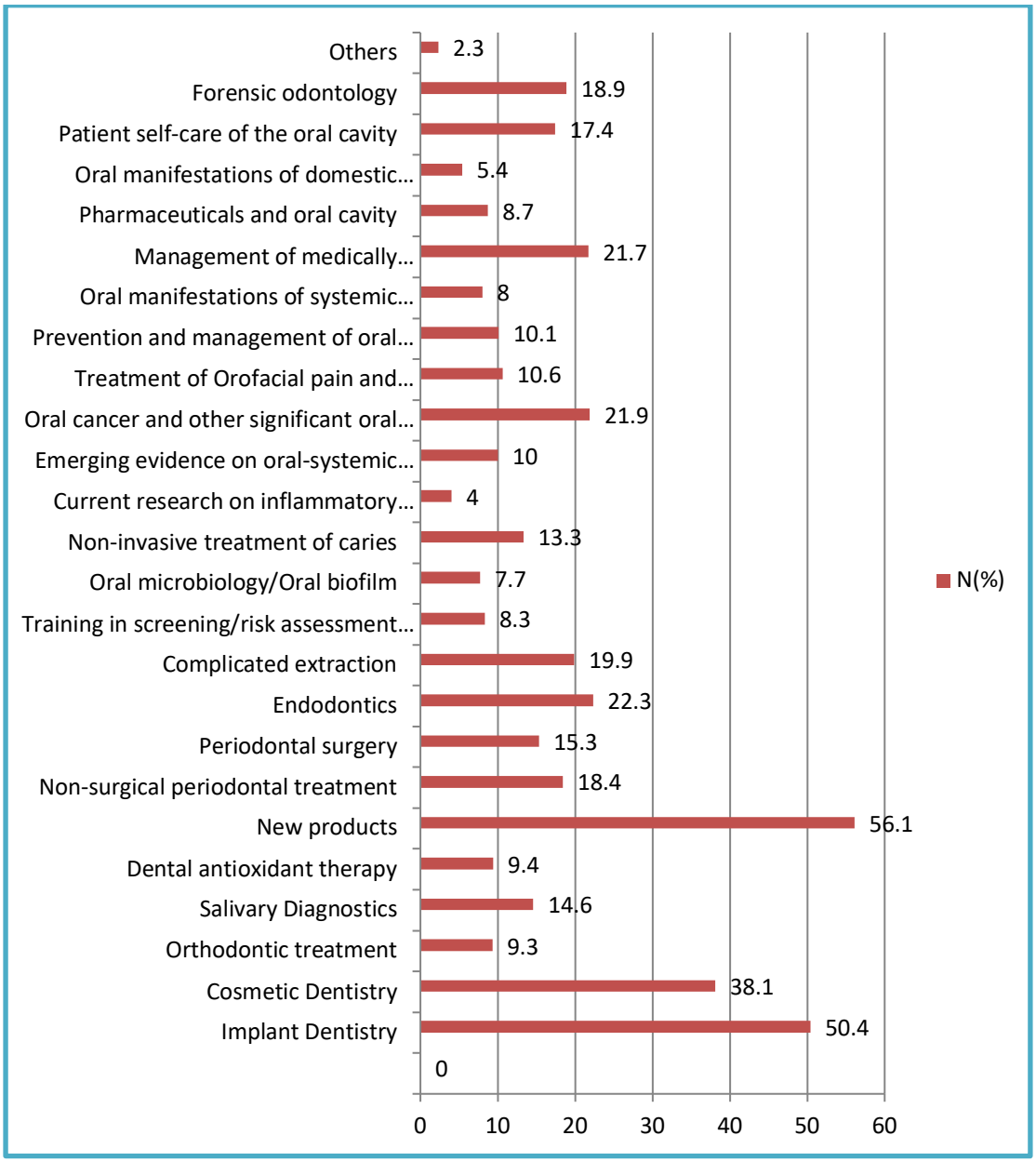
The Participants were enquired regarding their interest in the subject or topic of the course. Among the wide range of options, 56.1% were interested in courses telling about new products and equipments, 50.4% of practitioners showed interest in Courses on Implant Dentistry, 38.1% in cosmetic dentistry among others. 16 participants opted for the open ended question asking for the topic other than listed, where the participants

showed interest in some of the topics like communication skills, Dental Team, Medicolegal issues in dental practice, Oral Prophylaxis and Technically relevant lectures. (Table 26, Figure 203)

Table 26: Subject of Interest for CDE courses

Subject of Interest		N(%)
		Yes
Implant Dentistry		353(50.4)
Cosmetic Dentistry		267(38.1)
Orthodontic treatment		65(9.3)
Salivary Diagnostics		102(14.6)
Dental antioxidant therapy		66(9.4)
New products		393(56.1)
Non-surgical periodontal treatment		129(18.4)
Periodontal surgery		107(15.3)
Endodontics		156(22.3)
Complicated extraction		139(19.9)
Training in screening/risk assessment for oral diseases & conditions		58(8.3)
Oral microbiology/Oral biofilm		54(7.7)
Non-invasive treatment of caries		93(13.3)
Current research on inflammatory periodontal diseases		28(4)
Emerging evidence on oral-systemic interrelationship		70(10)
Oral cancer and other significant oral lesions		153(21.9)
Treatment of Orofacial pain and temporomandibular joint disturbances		74(10.6)
Prevention and management of oral trauma		71(10.1)
Oral manifestations of systemic diseases/conditions		56(8)
Management of medically compromised patients		152(21.7)
Pharmaceuticals and oral cavity		61(8.7)
Oral manifestations of domestic violence and child abuse		38(5.4)
Patient self-care of the oral cavity		122(17.4)
Forensic odontology		132(18.9)
Others		16(2.3)
a.	Communication Skills	11(1.6)
b.	Dental Team	1(0.1)
c.	Medicolegal issues in Dental Practice	2(0.3)
d.	Oral Prophylaxis	1(0.1)
e.	Technically Relevant Lectures	1(0.1)

Figure 20: Subject of Interest for CDE courses



The analysis of subject of interest for CDE courses with Gender as a parameter showed highly significant ($p<0.01$) outcome for Implant Dentistry, Non-surgical periodontal therapy, complicated extractions, Non-invasive treatment of caries, Patient self-care of the oral cavity and forensic odontology. Very highly significant ($p<0.001$) results were observed for Salivary Diagnostics, while Statistically Significant ($p<0.05$) variations were seen for Training in screening/risk assessment for oral diseases & conditions, Oral microbiology/Oral biofilm, Oral Cancer and other significant oral lesions. Management of medically compromised patients, Pharmaceuticals and oral cavity. (Table 27)

Table 27: Gender-wise distribution of subject of Interest for CDE courses

Selection of Course	Gender	Total N(%)	Chi-square value
Implant Dentistry	Male (327)	184(56.3)	0.004*
	Female (373)	169(45.3)	
Cosmetic Dentistry	Male (327)	132(40.4)	0.257
	Female (373)	135(36.2)	
Orthodontic treatment	Male (327)	27(8.3)	0.380
	Female (373)	38(10.2)	
Salivary Diagnostics	Male (327)	30(9.2)	0.000*
	Female (373)	72(19.3)	
Dental antioxidant therapy	Male (327)	29(8.9)	0.635
	Female (373)	37(10)	
New products	Male (327)	193(59)	0.151
	Female (373)	200(53.6)	
Non-surgical periodontal treatment	Male (327)	46(14.1)	0.005*
	Female (373)	83(22.3)	
Periodontal surgery	Male (327)	58(17.8)	0.092
	Female (373)	49(13.2)	
Endodontics	Male (327)	81(24.8)	0.139
	Female (373)	75(20.1)	
Complicated extraction	Male (327)	50(15.3)	0.005*
	Female (373)	89(23.9)	
Training in screening/risk assessment for oral diseases & conditions	Male (327)	18(5.5)	0.012*
	Female (373)	40(10.7)	
Oral microbiology/Oral biofilm	Male (327)	17(5.2)	0.020*
	Female (373)	37(9.9)	
Non-invasive treatment of caries	Male (327)	30(9.2)	0.003*
	Female (373)	63(16.9)	
Current research on inflammatory periodontal diseases	Male (327)	15(4.6)	0.453
	Female (373)	13(3.5)	
Emerging evidence on oral-systemic interrelationship	Male (327)	30(9.2)	0.495
	Female (373)	40(10.7)	
Oral cancer and other significant oral lesions	Male (327)	58(17.7)	0.014*
	Female (373)	95(25.5)	
Treatment of Orofacial pain and temporomandibular joint disturbances	Male (327)	34(10.4)	0.889
	Female (373)	40(10.8)	
Prevention and management of oral trauma	Male (327)	28(8.6)	0.195

	Female (373)	43(11.5)	
Oral manifestations of systemic diseases/conditions	Male (327)	22(6.7)	0.245
	Female (373)	34(9.1)	
Management of medically compromised patients	Male (327)	58(17.7)	0.017*
	Female (373)	94(25.2)	
Pharmaceuticals and oral cavity	Male (327)	21(6.4)	0.044*
	Female (373)	40(10.8)	
Oral manifestations of domestic violence and child abuse	Male (327)	17(5.2)	0.802
	Female (373)	21(5.6)	
Patient self-care of the oral cavity	Male (327)	44(13.5)	0.009*
	Female (373)	78(20.9)	
Forensic odontology	Male (327)	48(14.6)	0.008*
	Female (373)	84(22.5)	
Others	Male (327)	6(1.9)	0.458
	Female (373)	10(2.7)	
Communication Skills	Male (327)	5	
	Female (373)	6	
Dental Team	Male (327)	1	
	Female (373)	0	
Medicolegal issues in Dental Practice	Male (327)	0	
	Female (373)	2	
Oral Prophylaxis	Male (327)	0	
	Female (373)	1	
Technically Relevant Lectures	Male (327)	0	
	Female (373)	1	

The analysis of level of specialization with subject of interest showed statistically significant ($p<0.05$) differences for Salivary Diagnostics, Endodontics, Oral microbiology/Oral biofilm and Treatment of Orofacial pain and temporomandibular joint disturbances and Highly Significant ($p<0.01$) outcomes for Orthodontic Treatment. (Table 28)

Table 28: Level of Degree-wise distribution of subject of Interest for CDE courses

Selection of Course	Degree	Total N(%)	Chi-square value
Implant Dentistry	General (580)	290(50)	0.618
	Specialist (120)	63(52.5)	
Cosmetic Dentistry	General (580)	213(36.7)	0.089
	Specialist (120)	54(45)	
Orthodontic treatment	General (580)	45(7.8)	0.002*
	Specialist (120)	20(16.7)	
Salivary Diagnostics	General (580)	93(16.1)	0.016*
	Specialist (120)	9(7.5)	
Dental antioxidant therapy	General (580)	58(10)	0.255
	Specialist (120)	8(6.7)	
New products	General (580)	322(55.5)	0.463
	Specialist (120)	71(59.2)	
Non-surgical periodontal treatment	General (580)	112(19.3)	0.186
	Specialist (120)	17(14.2)	
Periodontal surgery	General (580)	92(15.9)	0.352
	Specialist (120)	15(12.5)	
Endodontics	General (580)	121(20.9)	0.047*
	Specialist (120)	35(29.2)	
Complicated extraction	General (580)	116(20)	0.835
	Specialist (120)	23(19.2)	
Training in screening/risk assessment for oral diseases & conditions	General (580)	49(8.5)	0.732
	Specialist (120)	9(7.5)	
Oral microbiology/Oral biofilm	General (580)	50(8.6)	0.048*
	Specialist (120)	4(3.3)	
Non-invasive treatment of caries	General (580)	78(13.5)	0.781
	Specialist (120)	15(12.5)	
Current research on inflammatory periodontal diseases	General (580)	23(4)	0.918
	Specialist (120)	5(4.2)	
Emerging evidence on oral-systemic interrelationship	General (580)	60(10.4)	0.504
	Specialist (120)	10(8.3)	
Oral cancer and other significant oral lesions	General (580)	129(22.3)	0.589
	Specialist (120)	24(20)	
Treatment of Orofacial pain and temporomandibular joint disturbances	General (580)	55(9.5)	0.039*
	Specialist (120)	19(15.9)	

Prevention and management of oral trauma	General (580)	59(10.2)	0.955
	Specialist (120)	12(10)	
Oral manifestations of systemic diseases/conditions	General (580)	43(7.4)	0.209
	Specialist (120)	13(10.9)	
Management of medically compromised patients	General (580)	129(22.3)	0.457
	Specialist (120)	23(19.2)	
Pharmaceuticals and oral cavity	General (580)	54(9.3)	0.219
	Specialist (120)	7(5.9)	
Oral manifestations of domestic violence and child abuse	General (580)	29(5)	0.271
	Specialist (120)	9(7.5)	
Patient self-care of the oral cavity	General (580)	98(16.9)	0.415
	Specialist (120)	24(20)	
Forensic odontology	General (580)	111(19.1)	0.676
	Specialist (120)	21(17.5)	
Others	General (580)	15(2.6)	0.158
	Specialist (120)	1(0.9)	
Communication Skills	General (580)	11	
	Specialist (120)	0	
Dental Team	General (580)	0	
	Specialist (120)	1	
Medicolegal issues in Dental Practice	General (580)	2	
	Specialist (120)	0	
Oral Prophylaxis	General (580)	1	
	Specialist (120)	0	
Technically Relevant Lectures	General (580)	1	
	Specialist (120)	0	

4.11. Open Ended Questionnaire for Experts

The open ended questionnaire was designed based on the preliminary findings of the earlier phase of the research. The said questionnaire was circulated among the experts who comprised of the Administrators in Dental Council, persons holding high posts in the professional associations, Editors of the reputed journals and administrative heads of dental institutions. Out of them, 6 experts responded and replied to questionnaire. The same was analyzed for their opinion and any common key words that can emerge from their answers.

Table 29: Results of Open-Ended Questionnaire from Experts:

	Question 1	Question 2	Question 3	Question 4	Question 5
Expert 1	Need Assessment should be done	Courses should be conducted in small towns, costs involved important factor.	Courses should cater to individual needs	Restructuring of Professional education in India	Should be regulated by council or association but costs should be reasonable.
Expert 2	Should be done once in three years by State Dental Councils.	Affordable courses Nodal agencies to be prepared to monitor these courses on zonal basis.	Courses should cater to individual needs	License to practice should be implemented based on CDE points	Appointment of nodal agencies such as IDA Need based assessment to be done every three years Nodal agency such as IDA or State Dental Councils to be appointed to look after standardization
Expert 3	Professional development courses should be categorized into basic & advanced.	Courses should be conducted on Weekends and holidays.	Separate courses for GPs and Specialists	It definitely needs to be regulated by professional organizations like Idea or any specialist organization	Organizations should be working as facilitator for programs with basic guidelines for the attendees
Expert 4	Professional bodies should undertake responsibilities of CDE topics and formats	Standardization of professional courses charges.	Separate courses for GPs and Specialists	License to practice should be implemented based on CDE points	Should lay down the guidelines for courses apart from need assessment.

Expert 5	Need Assessment should be done	Minimum cost and easily available like online or distant education seminars.	Separate courses for GPs and Specialists	Programs should be pre-approved by govt regulatory bodies for correct guidelines and content as per international standards & literature.	Govt regulatory bodies like dental council of india& state dental council should control the private courses conducted outside recognized dental bodies.
Expert 6	Need Assessment should be done	least costs involved and minimum travelling and most importantly at a convenient timing which does not interfere with their practice.	Courses should cater to individual needs than MDS or BDS	Need for Accreditation agency.	Accreditation council should be formed

4.12. Discussion of Results

4.12.1. Dental Profession and Continuing Professional Development in India

The First Dental school in India was established in 1920 in Kolkata by Dr. R. Ahmed. Since then the Dental Education in our country has undergone lot of transformation. Dentistry has emerged as an important component of healthcare industry in past few decades. Currently, the Indian dental care services market is estimated at about US$ 600 million and dental equipment and appliances market is around US$ 90 million, with a yearly growth rate of 10% (**Jain & Agrawal 2012**). As per the Cygnus Business Consulting and Research Report (2010), the Dental equipments industry in India was anticipated to reach US$ 116.43 million, the market of dental services in India may reach up to US$ 1.16 billion and oral care market to US$ 1.8 billion by 2014 (**Indian Dental Market 2010**).

Currently more than 300 Dental colleges in country add around 15,000-20,000 dentists to the healthcare sector every year. There is an estimate of more than 1 lac dentists in the country by 2020. Hence it is of vital importance to maintain the quality of dental services in the country. The field of dentistry is undergoing rapid transformation, with addition of newer materials and equipment to the clinical practice. In this scenario, the Continuous Professional Development plays an important role in maintaining the quality of Dental Practice.

The literature search revealed that there was no published data either reflecting the current status of CPD for dental professionals or assessing the needs of the dental professionals in India. Hence, this research was focused to evaluate the current status of the Continuous Professional Development in the country. For the feasibility purpose the sample was delimited to Gujarat.

4.12.2. Research Method

The Survey as a tool is commonly used for collecting the initial information or opinion from the population (**Behar-Horenstein et al 2016, Casebeer 2010, Chan et al. 2006**). The questionnaire survey is a preferred way of collecting the information with a set of predefined questions administered to the sample of the population (**Gaspard & Yang 2001, Al-Fouzan 2001**). The pilot survey was done on 32 participants which had mix of practitioners and experts. This was used to check the validity and reliability of the tool. This validated tool was administered to the sample of 700 practitioners.

4.12.3. Demographic Data:

Analysis of the Demographic data among the participants who consented to be part of the study shows about fifty three percent females and about forty seven percent males. This is in contrast to the WHO report on Healthcare Workforce data (2015) published based on the Census of 2001. They reported the Male to female ratio of 3.2. This change might be due to opening of new dental colleges in public and private sector post-2001. Many of the surveys done among the dental practitioners in recent year however have shown the equal distribution of males and females **(Nayak 2015, Rai 2016, Nadeem Jeddy 2018).**

Most of the practitioners participated in survey were recent graduates. Around seventy-six percent of the practitioners were having less than 5 years of clinical experience, while only about two percent participants had more than twenty years of experience. Analysis of the demographic data by **Al-Fouzan(2001)** in a study on continuing education needs in Saudi Arabia also revealed that most of the participants were recent graduates, who had exposure to the newer developments in the dental field during their graduation.

One of the studies reported that physicians with higher specializations were more likely to participate in CMEs as compared to physicians with MBBS degrees. A focus in one of the specific disciplines of medicine, may encourage them to actively participate in lectures and workshops. It is also possible that the physicians having higher than MBBS degrees are more active and have greater interest in personal and career development, due to which they may be participating in the CMEs more frequently (**AL-Hejji and Alramadan, 2015**).

4.12.4. Past CDE hours & Frequency of attending CDE

Some of the important factors in deciding the outcome of Continuous Professional Development are amount and frequency of professional development courses attended. The number of CDE hours will have impact not only on their clinical skills, knowledge and attitude, but this will also be an important factor in selection of professional development courses in future. Though closely related these two factors are independent of each other. Some of the practitioners may prefer to attend a single course of few days' duration, while others may prefer to attend short duration lectures and workshops a greater number of times.

Some of the studies observed that there is an exponential rise in number of Continuing Dental Education programs worldwide. But attendance in these programs is very poor. They also mentioned that the scenario of CDEs is same in India. There is an increasing gap between the quantity and quality of courses (**Nayak et al. 2015, Giriraju A 2013, Leggate M and Russell E 2002, Al-Sudani D. 2000**). Among the participants in our study, forty-six percent had attended the CDEs for 0-10 hours while about thirty-six percent had attended for 11-20 hours. The female participants had attended CDEs for 0-10 hours in greater percentage as compared to males.

The Continuing Professional Development programs are organized in various ways like conferences, workshops, CDE lectures or scientific events with fairs. A study in Indian dental population by **Nayyak et al (2017)** found that majority of dentists participated in conferences or workshops at least once in 6-12 months and attended CDE courses and dental fairs once in more than year. The similar results were seen in studies conducted by **Bullock A et al., and Hopcraft MS et al.** However, **Neiri M and Mauro S (2008)** found the contradictory results where the practitioners attended both conferences and CDE courses in equal frequency.

The Significant variations based in gender and their preferences were observed in frequency of attending professional development programs. The females preferred the professional development programs to lesser extent, which might be due to familial commitments of females towards their families. The results of our study also support this finding with male participation in CDEs significantly higher than females (**Best 2005, Nayak 2017**).

Our study also showed that the significant difference in hours of CDEs attended and frequency of attendance amongst the specialist as compared to the general practitioners. The reason being the higher level of skills and knowledge may have impact on the attitude towards self-upgradation and upliftment. Similar results were observed by some other researchers wherein they observed better participation of specialists in CDE activities as compared to general practitioners. They suggested the higher exposure of specialists during postgraduate courses as possible reason for this (**Best 2005, Nayak 2017**). They also spotted the significantly higher reading on journals, periodicals and attendance in dental fairs among specialists, possibly due to their training in analyzing

research articles and better exposure to workshops and conferences during their specialization (**Nayak 2017**).

Nayyak et al(2017) also reported that frequency of professional development activities was not proportional to the perceived rating of their usefulness. They mentioned that referring textbook was rated as one of the most useful CPD activity but they were less frequently used. They suggested that this could be because, activities like discussion with colleague and medical representatives are much easier ways of accessing information than textbooks, which consume significant time.

It was also observed by some of the researchers that less experienced and recently graduated physicians would practice professional development more often compared to those who have more experience and have been practicing for many years. The factors such as age, gender, number of children, number of years since graduation and increase in social responsibilities with increased age and a decrease in interest in gaining new medical knowledge and new medical skills were identified to influence frequency of attending continuing professional development programs (**AL-Hejji and Alramadan, 2015**).

It was observed that the job satisfaction played an important role in attending CMEs. Those who were not satisfied with their job in PHC centers were more likely to practice CME rarely or never compared to those who are satisfied. The satisfaction of job was found to be an enhancing factor for further update in knowledge by attending CMEs thereby resulting in better skills in clinical practice (**AL-Hejji and Alramadan, 2015**).

4.12.5. Information about upcoming events

The publicity and marketing of the professional development program is one of the very important aspect. It is very important to disseminate the information about the professional development program among the practitioners.

Planning a very good CDE with well-designed curriculum, learned speakers isn't enough to drive practitioners to the continuing dental education program. The information about the professional development program should be percolated to targeted learner group. While promoting the program to target audience, one has to ensure that all the details of the program is included in the information brochure. In the present times the social media has become the integral part of one's life. It was observed by **Henry et al(2012)** in a survey on dentists in United states that dentists are actively using social media for marketing and communication in their dental practice. The same can be used by the program organisers for promotion of the CDE program. This medium of promotion is highly effective, fast and reasonable. In our survey majority of practitioners informed that email and internet are the most common way of getting information about upcoming event. The next most common mode of information about upcoming CDEs was through colleagues, followed by advertisement journal. It was also observed that significantly higher percentage of female participants got information about this from colleagues as compared to male.

4.12.6. Factors for Selection of courses

The number of factors may influence the undertaking of professional development courses by dental practitioners. Some factors like cost of course, topics, instructional method may influence the practitioners.

Young and Rudney (1991) found that quality of course was more important factor than cost of course and distance among practicing dentists within six state regions of the upper Midwest Europe. They also observed that the Lecture teaching formats were more frequently requested than either participation or demonstration formats. Their results also indicated that dentists with less practice experience were most interested in the in-depth type of participation program. The results of our study also showed that the subject area, instructional method and instructors qualification were more important factors than the cost of the course, especially for the female participants.

The specialist dentists in our study significantly felt that the cost, instructional method and instructors' repute are important deciding factors in CPD. Buckley and Crowley (1993) observed that specialist practitioners and dentists associated with hospital were aware of the professional development programs and attended them more frequently.

The location of the courses was also seen to be an important deciding factor in our study. Around thirty percent participants felt that location of the course is an important factor, may be due to the reasons such as time and cost involved in travel and subsequent absence from the practice. **Belfield et al. (2001)** described the costs involved in CDEs as provision costs and opportunity cost of professionals' time. **Leggate and Russell (2000)** suggested that the practitioners who had cleared their graduation recently are more reluctant to pay for CDEs, may be due to financial burden of the clinical practice along with educational debts.

4.12.7. Preferred method of instructions

The method of instruction forms a very important factor in continuing professional development. The continuing professional development highly relies on the principles of Adult learning. In a significant shift from Pedagogy, the adults themselves are

responsible for their own learning in Andragogy. One of the critical concepts in Adult learning is about the Self-Directed learning. In Self-directed learning, the adults make all the decisions for their own learning like setting their own learning goals, choose the appropriate learning method, find suitable resources and monitor their progress (**Stephen, 1986**).

The scientific and technological career needs along with available time and finances of individual practitioners play major role in devising the best models of professional development. The programs and the courses run by professional bodies, institutions and universities are usually more preferred by practitioners. **Chan WC et al.(2006)** expressed the necessity for assessing current tendencies in the needs and preference for continuing education courses or postgraduate programs raised within groups of general dental practitioners.

Our study showed that the Live lecture was the most preferred form of continuing professional development program followed by hands-on course in clinical setting. These courses with hands-on demonstrations are most preferred as they simulate the clinical situations and gives learner better understanding of said skills and knowledge. Similar results were observed in some of the studies where the most preferred method for CPD courses was hands-on treatment on live patients, followed by hands-on simulated clinical conditions (**Al-Jarallah K, Premadasa IG. 2003, Leggate M, Russell E. 2002**). However, in another research by **(Giriraju et al.,2013)** the audiovisual presentations were the most form of professional development program followed by hands-on programs and Workshops

Hands-on courses were also the most preferred format of CPD for dentists, specialists, hygienists and dual- trained therapist/hygienists, and the second most preferred format

for prosthetists and therapists in the study by **Hopcraft et al**. The most preferred format for prosthetists was attending lectures, and for therapists it was attending small group tutorials.

The results of our study showed that male practitioners had higher preference for self-instructional online courses, while females preferred Hands-on courses and Weekend workshops as compared to males. Our results also showed that Self-instructional online and Destination programs were preferred by General practitioners as compared to the specialist. Specialist significantly preferred Hands-on courses over general practitioners. In the similar findings, **Nayak et al.(2015)** also observed that higher number of specialists preferred seminars, lectures, and symposiums as compared to general practitioners. The possible reason given by them is higher exposure and familiarization to the subject during their postgraduate training.

The studies by **Nayak et al.(2017), Nieri M and Mauro S, Selvi F and Ozerkan AG(2002)** observed that practitioners favored conventional methods of information sources like discussion with colleagues and discussion with medical representatives as well as modern information technologies like internet usage to a large extent. The studies by **Bullock A et al. (2013,2010)** also showed similar outcomes. While **Al-Sudani (2000)** found out that journals were the most frequently utilized information sources, followed by reading books.

Nayak et al(2017) and **Selvi F and Ozerkan AG(2002)**, in their respective studies, found that the professional group discussions, referring books, journals and online information were very useful tools of professional development along with CPD courses, workshops and conferences.

Learning preferences for educational media amongst the practitioners was considered as an important domain for research in this field. The detailed analysis of descriptive survey by **Blakely JT(2006)** showed that German general practitioners preferred the "classical" learning environments such as: journals, discussion with colleagues and clinical study groups. The newer learning techniques such as online courses were not the preferred choice. The results here are similar to findings in our study where only around fifteen percent of practitioners preferred self-instructional online learning method. It is observed that though the use of internet is increased over the period of time, it is still not considered as a preferred method for learning. This might be due to lack of hands-on experience or clinical exposure in online courses.

Volmer et al. (2009) had performed the factor analysis to identify different type of learners among the general practitioners. They broadly identified the learners as the intrinsic, the extrinsic and the collegial or interactive learner. They suggested that about 70% of the physicians preferred to discuss and deliberate the topics with colleagues (collegial or interactive learner) rather than to meet experts(extrinsic) or to read a book(intrinsic) **(Vollmar et al., 2009**). They also observed that didactic quality, suitability, and efficacy were the important factors for the respondents. For those physicians who used the Internet frequently efficacy was most important, whereas for GPs who used the Internet only marginally, didactic quality was more relevant. The results here are in contradiction with our study, where general practitioners preferred the self-instructional online courses more as compared to the specialists, whereas the specialists preferred hands-on courses in clinical settings more. The degree of skills acquired during the specialization along with internet usage might have influenced their choices.

There are many conferences, symposiums and clinical meets being held nationally and internationally for the various disciplines of the dentistry. These scientific programs are usually held with specific theme or the topics, where the specialists can acquire or share their knowledge. The general dental conferences specifically targeting general practitioners are organized less frequently and hence the general practitioners might have given the preference for the destination courses. The destination courses have advantage of learning in different setup along with the change from daily routine for the practitioners.

The study among the Primary Health Center(PHC) physicians in Saudi Province by **Al-Hejji (2015)** showed that they prefer self-learning Continuing Medical Education activities over lectures and workshops. They also found that the physicians preferred self-learning activities, such as reading and interactive computer programs and were more likely to practice CMEs. They also observed that lack of preferred methods of CME course can be deterrent to professional development. Self-learning activities, such as reading medical books and journals and interactive computer programs either as CDs or through the internet might satisfy some physicians' needs for medical knowledge over lectures and workshops.

4.12.8. Hindrances in CDE

The Continuing Dental Education programs are being held at various levels, but many times it is observed that number of participants does not match with the number of registered members of association. This might be due to various hindrances in pursuing CDEs. In present study, various hindrances encountered along with the reasons was recorded by the responses of the population. The present study revealed that 60% of them opined that practice being too busy is the frequent reason for not attending CDE,

with most of them stated that timing of the course and time needed to travel are the always and frequent reasons for the hindrance in attending CDE. The gender-wise distribution revealed a significant difference for practice being too busy, timing of course and the time spent away from the family being the hindrance for not attending CDEs. It was also observed that the level of degree, the timing and time needed to travel show the variation in general practitioners and specialist along with the time spent away from the family. Some of other studies also mentioned the lack of time followed by family commitments as the most important barriers in attending CPD programs **(Al-Jarallah K and Premadasa IG. 2003, Giriraju A et al. 2013, Al-Sudani D. 2000].** The financial constraints such as lodging expenses, distance from home and course duration were also important barriers in for attending the professional development courses (**Bauer and Bush, 1978**).

But study by **Al-Hejji et al. (2015)** on physicians found contradicting results where the physicians busy with high patient load or having multiple work responsibilities at work were more likely to practice CME compared to those who did not have. The possible reasons explained by them are that the CMEs may help them to manage large number of patients reporting to them with various diseases and complications. These professional development courses may help them to perform their duties in better and efficient way. The physicians who are updated with recent knowledge and skill are often recognized by both the patients who will be more satisfied with his/her services and the physician's managers.

Nayak et al. (2015) observed that since many practitioners in India work for 6 days every week, there could be paucity of time to pursue professional development. They did not find any substantial differences in reference to various barriers with gender as

a variable, but found a significant difference between the graduates and specialists in perceiving a lack of time as a hindrance for participating in professional development. The possible reason they had suggested for this could be awareness among dental specialists regarding the significance of CDEs as an important facet of dental practice (**Nayak et al., 2015)**. The present study also spotted the significant difference about perceived hindrances concerned about the time like time away from family, time to travel and timing of course among the males and females as well as general practitioners and specialists.

The lack of access to health sciences library was also considered as one of the hindrances in professional development by some of the practitioners. There was highly significant difference among males and females as well as general practitioners and specialists in perceiving this as hindrance. **Al-Hejji (2015)** mentioned that in Alahsa Region of Saudi Arabia, the majority of the PHC physicians do not have access to electronic medical libraries and the availability of interactive computer programs and group learning activates other than lectures and workshops are very limited. The access to health sciences library and various online portals to access the latest scientific information plays a very vital role in professional development. In the era of evidence based treatment protocol, this becomes even more important to have access to latest relevant evidence. The Computers and mobiles are very essential part of peoples' lives. The access to online information is one of the easy and preferred sources of information in any profession as it provides updated information in a relatively short time. **Al-Hejji (2015)** found an association between the availability of computers and professional development among physicians. Physicians who have no access to computers at work were less likely to frequently practice CME. The present study also observed that lack of appropriate computer hardware or software as one of the hindrances. Since most of

the practitioners in our study perceived the lack of computer literacy was never a hindrance, but lack of appropriate computer hardware or software was a barrier in professional development.

The significant difference was also observed between the general practitioners and specialists with later being more acquainted with the computers.

Bullock et al. (2010) found four main constraints on participation of general dental practitioners in professional development in United Kingdom. They were costs involved, personal and staff issues, time and restraints owing to regulating body.

Alsharif AI and Al-Khaldi YM (2001) also found that the lack of time, work overload and family obligations were the most common barriers in pursuing professional development courses.

4.12.9. Preferred Timing to attend the courses

Preferred timings to attend the live continuing Dental Education course shows variation in their preferences. Almost seventy percent of the respondents did not prefer weekdays breakfast or weekdays lunch time for attending courses, whereas around fifty percent showed moderate preference for evening time in weekdays. Around fifty five percent of them preferred the weekends and holidays.

Alsharif AI and Al-Khaldi YM (2001) in their research on PHC physicians found that, to overcome various barriers in pursuing professional development, the preferred timing for CMEs should be Thursday mornings which is a weekend in their country.

4.12.10. Subject of interest

As discussed earlier, an adult learner has the freedom to choose the time, place and topic of learning. In this context it becomes very vital to understand the preferences and

the choices of the learner. The subject of interest and selection of topics by the dental practitioners is dynamic and influenced by individuals' choices, preferences, current trends and problems encountered in clinical practice.

The professional development courses are very important tool in knowing the current trends and updates in the field of dentistry. Dentistry is an amalgamation of art and science to provide the aesthetic and functional results to the patients. The practitioners are always eager to know the newer products and materials to enrich their clinical practice. More than fifty percent respondents in our research wanted to know about the new products. Dentistry is changing very fast with newer materials and products added to the armamentarium every day. Clinicians always want to learn about these products and the professional development courses highlighting newer products are best way to get introduced to these.

In present study, most sought topic was Dental Materials, second Implantology and third Cosmetic dentistry. This was in line with the current trend in clinical practice. Similar results were found in other studies where majority of practitioners preferred aesthetic dentistry, followed by endodontics, and implantology, as topics for CPD courses (**Chan et al. 2006, Giriraju A et al. 2013, Leggate M and Russell E. 2002, Nieri M and Mauro S. 2008**).

Majority of the participants in our study preferred the clinical topics like Implant Dentistry, Cosmetic Dentistry, Endodontics, Periodontal Surgery over the non-clinical topics such as Salivary Diagnostics, Pharmaceuticals and Forensic Odontology. Similar results were observed in a research by **Giriraju et al. (2013),** where higher number of practitioners opted for recent advances and clinical applications in dentistry.

Some of the topics like Orthodontic treatment, Endodontics and Treatment of Orofacial pain and temporomandibular joint disturbances had significantly higher preference among the specialist as compared to General practitioners. The topics highly preferred by General practitioners were Salivary Diagnostics and Oral microbiology. As observed by some of the researchers that topics like Aesthetic dentistry and implantology are not incorporated in undergraduate curriculum in detail. Such topics are preferred by the practitioners across the globe as reported by some of the need assessment surveys (**Chan et al. 2006, 10. Best HA, Messer LB. 2001**). Significant variances in preferences for particular topics was observed among the graduates and specialists for periodontics, aesthetic dentistry and crown and bridge, which could be because of interest in furthering their knowledge on more byzantine forms of treatment.

Substantial gender-wise differences in preferences for topics of CDEs was observed in our studies. Significantly higher percentage of male participants preferred implant dentistry as compared to females. Females preferred topics like Salivary diagnostics, Non-surgical periodontal therapy, complicated extractions, training in screening/risk assessment for oral diseases, Oral microbiology, non-invasive treatment of caries, Oral Cancer, patient's selfcare and forensic odontology in significantly higher percentage. Some of the other researchers also noticed significant differences amongst males' and females' preferences for CDE topics with aesthetic dentistry, Oral implantology, and periodontology as preferred topics (**Giriraju A et al. 2013**).

The survey done by **Henry (2000)** revealed interesting findings that the participants' preferences for Continuing Dental Education covered a wide range of courses, of which those related to clinical science and techniques for oral implantology and cosmetic dentistry were most sought after. Similar to the results of our study, oral implantology

scored the highest in terms of preference in their study amongst participating dentists from Hong Kong and Mainland China. In the past few years, cosmetic and implant dentistry has been growing at an accelerated rate all over the world (**Henry 2000**). In the early years, implants were usually placed by oral surgeons and supra-structures restored by prosthodontists in a team approach. However, due to the continuous improvements and simplification of implant hardware and surgical techniques, general dental practitioners have become increasingly interested in providing implant treatment. As implant dentistry is only briefly covered in undergraduate curriculum, continuing education courses in oral implantology have filled this educational void and met the growing needs of general dental practitioners. Cosmetic dentistry has also grown substantially within the last 10 years. Scientific and technological advancements including the contemporary bonding techniques along with public and media attention keep fueling the flame. It is conceivable that general dental practitioners are highly interested in enhancing themselves through continuing education courses and keen to incorporate cosmetic dentistry into their daily practices to meet the increasing demands of the public. Furthermore, dentists from Mainland China showed significant interests in improving their skills in practice management, but such preference was less obvious amongst dentists from Hong Kong and the other Asia-Pacific regions. In overall terms, orthodontics and prosthodontics were the most popular choices when it came to the preferences for clinical degree programs. The current motivation for long-term educational commitment may be driven by the substantial demands of the public. In Hong Kong, the fertility rate is relatively low and most parents are placing their resources on their children more willingly than before. There is obviously a great demand in orthodontic treatment. Furthermore, the population in Hong Kong is ageing. It is predictable that the growth in the proportion of the elderly population will continue

to increase as the birth rate is decreasing. The potential market for prosthodontic works including implant treatment is vast. In Mainland China, the national economy has developed at a tremendous speed and the people's living standard has greatly improved. It leads to a much better life with the per capita income approaching that of moderately developed nations, especially in the major cities. However, a low birth rate remains in China due to the re-enforced national policy of family planning, which enables the parents to afford the relatively expensive orthodontic treatment for their children. Meanwhile, the public awareness of oral health and aesthetics has greatly increased. Therefore, in response to the increasing needs and demands of the public, general dentists from Mainland China are increasingly keen to enroll in orthodontic clinical degree programs. For Hong Kong dentists, family dentistry was regarded as a high priority. They may consider this newly launched program as highly relevant to their future general practice. Furthermore, this programme is currently conducted on a part-time basis and hence can facilitate the participation of both the established and younger practitioners without significantly interrupting their daily practice. Degree programs on a part-time basis will fulfil their educational commitments to update professional knowledge and clinical skills, and at the same time provide them with further qualifications. It is evident from the present survey that postgraduate education providers are encouraged to offer part-time degree programs in other clinical subjects as well to meet the increasing needs and demands. Similar surveys conducted in the United Kingdom pointed to preponderant orientation towards restorative dentistry and orthodontics as the main subjects of interest in postgraduate programs (**Ireland 1999**). Short-term courses remained the favorite CPD format for professionals in the United Kingdom (Leggate 2000, Chan et al., 2006).

4.12.11. Open-Ended Questions from Experts

The experts and administrators working closely in the associations and governing councils play a very important role in continuing professional development among the dental practitioners.

Joel M. Weaver, Editor-in-Chief of Anaesthesia Progress, in an editorial expressed that the dentists are supposed to be life- long learners as any other professionals. The educational courses in dental schools provide the basic knowledge and skills to lay a strong foundation. It is the responsibility of the practitioners afterwards to build and develop themselves. They can also increase their number of areas of clinical proficiency, defined as a level of knowledge, skills, and values attained when a particular activity is accomplished in more complex situations, with repeated quality, and with more efficient utilization of time (**Weaver, 2009**).

We have attempted to understand the current status of Continuing Professional Development in Gujarat. We had searched the available literature and contacted the office of the state dental council. The important finding that came to light that there was no need assessment done among the dental practitioners for Continuing Dental Education among the dental practitioners of not only Gujarat, but whole of India.

The Faculty of Dentistry at King Abdulaziz University (KAU) had planned to develop a Master's program in dental public health (DPH). They performed need assessment exercise to identify the existing gaps, current perception to aid in developing the curriculum for the said program **(Al Agili, 2015**).

Our experts also expressed the need to assess the requirements of the practitioners to cater their individual interests. They were of the view that this type of need assessment must be undertaken so that programs are structured according to the requirements of

general practitioners which can be designed and executed. Dentistry has advanced in technology and clinical knowledge in past decade. One of the Expert was of opinion that to keep abreast of these advancements and to implement them into clinical practices, Continuing Dental Education is essential. This ongoing dental education can be achieved by participating in various courses, conferences, and conventions. Continuing Dental Education program keeps the practitioner updated with professional knowledge and skills. So various programs pertaining to general dentistry and dental specializations should be conducted regularly and should be made as a mandatory requirement for licensing procedure or for the renewal of registration. The assessment needs for the general dental practitioners can be done once in three years by the State Dental Councils and based on this the mandatory requirements of attending topic based programs can be proposed & implemented.

According to other Expert there has to be Continuing Dental Education program regularly for general dental practitioners and if possible should be made mandatory for everyone. And the program should be of three types

1. Programs focussing on normal procedures carried out by the practitioners, how that can be performed more efficiently with new and advanced instrumentation.
2. Programs focussing on new treatment modalities that can be in the form of lectures and Hands-on.
3. Programs covering most advanced procedures or advances in procedures.

The fourth Expert felt that the main objective of a CDE program in today's context especially in India has become very diverse especially with commercialisation of CDE programs. Further the number of experts invited as mentors in such CDEs has also multiplied exponentially. Programs today focus only on topics that will attract delegates

rather than the need to conduct such a program. A need assessment exercise will surely address the issue, however not until organising bodies get recognised centrally. As on date professional bodies, societies, associations, committees, institutes, academies, cells, persons, individuals are organising CDEs and unless they get scrutinized professionally in unbiased and blinded way with no commercial interests, regularising CDEs will be a futile effort. Today delegates too need to realise that after spending hefty registration fees, they take back nothing great scientifically to add value their practice. However, conduct of a need assessment exercise is also a difficult task, because it involves logistics in conduct of the survey and sincerity in answering the survey. Parallel to this central bodies like the IDA or DCI or a centrally constituted NATIONAL CDE WING should undertake the task of identifying, standardising, acknowledging and recognising mentors. This can be done primarily by listing courses, as basic and advanced, invite applications and screen mentors unbiased. Further fixing a remuneration for lecture, demo and hands on would standardise the program conduct further. All said, unless the process is bilateral with both the dentists and the central body taking up equal responsibilities to streamline CDEs, every attempt would remain futile. The action plan for this may be gazetted and made available on professional bodies websites.

One of our expert, who also happens to be President of governing council also felt need to assess the requirements for the practitioners for CDE in the form of topics, method of delivering the knowledge and skill along with the costs and logistics.

One of other expert, who happens to be an editor of a reputed international journal, raised concerns regarding no proper need assessment ever done for general practitioners before any CDE is planned. He felt that it is on hear and say policy or the companies

who either would like to promote their products or sponsor the program, which generally decide the content of CDE.

The opinions of our experts were similar to the outcome of questionnaire survey designed by **Gaspard and Yang (2016)** to find the demographics, training needs, and preferred approaches to improve performance of the target population among the health care professionals in Saint Lucia. The need for continuing professional education was rated the highest priority, followed by research/audit activities. They concluded that providing training as per the needs is important, particularly in developing countries (**Gaspard and Yang, 2016**).

Our research showed out that factors such as costs involved, timings of the course, distances required to travel for courses affects the preferences of the dental practitioners regarding the selection of professional development program. One of our experts observed that previously most of the programs were restricted to the Metros due to the factors mentioned above, as related to the faculty who didn't want to travel and didn't get the required infrastructure needed for the program. This obviously meant that the participant had to travel and also reside in the Metro in case of a longer duration programs. Anything that strains the budget is a great deterrent to attend. Nowadays the mentors are willing to travel to smaller centres as it increases their reach and good infrastructure is also available. This definitely helps increasing the number of participants.

Other Expert was of the opinion that Professional Development Programs should be made affordable. Such programs shall be conducted in Dental Conferences with pre-defined schedules, making it convenient for dental faculties and practitioners to attend. The nodal agencies such as National Professional Dental Associations and National

Speciality Bodies should be assigned the responsibility of conducting such programs and their certification should be considered for renewal of Dental Council registrations. An individual practitioner on completion of the stipulated topic based CDE programs should be eligible for Licence renewal or renewal of the registration. These nodal agencies should be asked to conduct programs on Zonal basis along with National program every year (with four zones divided within the country) so as to minimize the travel and other expenses incurred. The need for upgradation of knowledge & skills has seen many individuals and commercial trade industries exploiting the young graduates in terms of high cost for such CDE programs organised by them individually and with the quality of the same being questionable many a times. These programmes should not be considered for the renewal of licence or registration.

Most of the experts felt that courses should be carried out on weekend or Sundays, should not clash with any holidays on religious occasions. Distances should not be very long as that can give more expenses and consume travelling time. It is absolutely logical for a delegate to choose a course close to his / her residence. Hence local branches or bodies need to take initiatives; however, these can be possible only if a protocol is established and strictly followed. In fact, if needed, the same should also be reflected in the code of ethics of dentists in India by proper gazettes. But some expert felt that those who want to learn something more and want to sharpen their skills, these factors may not come in way.

Conduct of CDEs should focus on continued learning by dentists to orient, refresh and update. Costs can be brought down provided the objective is restricted to knowledge dispersal. Further the practice of remuneration or honorarium provided should be either removed, or if necessary should be standardised according to the nature of the CDE.

This in turn would reduce registration charges. This can present a possibility of very few mentors who will volunteer for teaching at no or nominal costs. However, this should be seen as a temporary phase. In due course the bodies will have a good panel of mentors.

Some of the experts also suggested to have online courses and better use of ICT to minimise the problem of logistics and costs.

Catering to individual needs of practitioners is preferable but not always possible. Our experts opined that taking into consideration that one only wants and needs to know something that he/she is not proficient in, eg a Prosthodontist would want to learn Bone Augmentation and a Periodontist a Full Mouth Rehab. So, at this stage both are equivalent to a General Dental Practitioner. There need not be separate courses as per the qualifications but there could be a two-tier system of courses i.e., Basic and advanced, leaving the choice of attendance to the participant.

Impetus for lifelong learning process varies among individuals. Many practitioners may have an inherent desire to gain new knowledge as well as update their professional skills to exhibit their treatment skills to patients, colleagues and employers. A certified course can provide them the opportunity to gain from the experience of the faculty members as well as can provide points for continuing practice. So professional development courses can be beneficial on individual practitioner as per their requirement. Irrespective of the practitioner being a general dentist or speciality practitioner, he/she is required to have and revise the knowledge of basics involved of all the specialities since Dentistry involves a lot of interdisciplinary considerations.

But some of the experts felt to have separate courses for general practitioners and specialists as they possess different level of knowledge and skills. Professional

development programs need to be planned differently addressing the needs of the dentists. Dentists with PG degree or equivalent often have learnt basic training in most areas of dental diagnosis and treatment planning during their PG course. Though PDPs can't be restricted to the dentists with a bachelor's degree, however it should be mandatory that they have attended basic courses needed as preliminary Basis for advanced courses. The same can be made applicable to those courses for dentists with Masters degrees where the courses are not included in their postgraduate curriculum. The choice would also vary depending on the kind of practice one has. If MDS is into some kind of speciality practice, his choice would be to have CDE related to his speciality So, the kind of practice determines the need.

In many of the western countries professional development programs in the field of dentistry are regulated or accredited by some regulating or professional body. Details guidelines are laid down for the same like ADA-CERP guidelines in US. In absence of any such clear guidelines, the experts we asked were of opinion to have similar guidelines or regulations in India. Many of the experts suggested to have mandatory CDE programs for renewal of licensure to practice. One of the expert expressed that unless we have a separate registry for Dental Specialists, all the Dental Graduates (BDS and MDS alike) are free to practice any and every branch of dentistry they want. Once there is a separate Specialist Register, the General Dentist and the Specialist too will be restrained by its provisions as to what can be practiced. But this will strain the already deficient resources available to the populace. Education is now a free enterprise and it is up to the participant to choose whose and which course to attend. This leads to a lot of malpractice as today's student becomes tomorrow's teacher. Most of the basic knowledge should be provided in the Dental Schools itself. A real restructuring of the type, quality and quantum of education being provided needs to be looked at rather than

the mundane things that are looked at. Licence to the practitioner should be provided only after fulfilment of norms and regulations as per DCI & a follow up and update and upgradation of this should be carried out per annum. One of the expert felt that in the INDIAN scenario, there has been mushrooming of many courses that are conducted with no accreditation by the concerned body. The DCI, IDA should make initiatives towards such accreditation, and employ strict rules to renew registrations on basis of attendance at these accredited programs. In addition, attendance at such accredited programs can also have international significance and recognition in case of admission especially for abroad university educations and jobs. They also voiced that any professional development programs should be regulated as they are related with individual's health. Programs should be pre-approved by govt regulatory bodies for correct guidelines and content as per international standards & literature. Government or Dental Council should consider about how to control the individual educational programs going on for just making money without providing quality education.

As is the scenario in many western countries, one of our experts felt that it is always better to have the courses regulated by the Council or Association. But, education is a free enterprise and we cannot and should not prevent anyone from spreading knowledge, even if it is for a price. But there is a need of some check on the possible malpractice that could occur. In short, the organizers and mentors should have their morals in the right place and not try to make a fast buck from the unsuspecting and unfortunately untrained general dentist.

The role of regulating bodies such as Dental Council of India, State Dental Councils and professional organisations like IDA should be:

1. Appointment of nodal agencies such as IDA and speciality bodies for continuing professional development programs.
2. Dental practice need based assessment to be done every three years and the list of topic based programs prepared by the State Dental Councils, which should be attended by the dental practitioner as a minimum requirement for registration/ licence renewal.
3. Nodal agency such as IDA or State Dental Councils to be appointed which will look after standardization of dental clinics and will grade them based on the infrastructure available.

They should be working as facilitator for programs with basic guidelines. The role of National Dental Bodies is very pivotal. They need to assess every program application for the mentor credentials, course content, fees and certification. These accreditation's should also translate into mandatory requirements for dental licence renewals. Course should be invited only for those topics where need is felt for enhancing professional development. Apart from need assessment exercises, Guidelines should include affordable fees, mentor reimbursement, differential accreditation points depending on nature of course, duration of course, credit point systems. Quality mentors spread over the length and breadth of the country should be invited, assessed and identified. Timings of the courses should be conducive for practitioners, (can be clubbed with national conferences). One of the experts felt that a nationwide survey on dentist's views on the same shall help throw light on these aspects in a better way.

Other expert was of opinion that the accreditation council should be formed which should device guidelines for accrediting a CDE program on the basis of its content, its relevance, speakers and whether the practitioners were asked about the program they

want. Every member should have to gain specified number of points each year. The attendance should be compulsory and biometric attendance should be noted. How much time did a participant spent inside the hall listening to lecture should be first prime criteria to award CDE points and secondly the participant should answer 5-10 MCQs on the topic of CDE immediately after the CDE to gain rest of the CDE points.

4.12.12. Continuing Dental Education in Indian Scenario

The Continuing Dental Education in India has grown exponentially in past decade. With increased number of dental colleges as well as more dental graduates and postgraduates coming out, the demand for professional development courses is ever increasing. In India, the dental colleges, professional associations, product manufacturing companies as well as individuals are involved in administering the CDE programs. As mentioned earlier, we had written to **Gujarat State Dental Council** for the information regarding the CDE programs regulations and guidelines. We were informed that there was no need assessment done for the practitioners in Gujarat nor there were any guidelines for regulation of CDE programs. There is no mandatory requirement for the practitioner to attend specific hours of CDE for renewal of licensure.

In consultation with the Ministry of Health & Family Welfare, Govt. of India, **Medical Council of India** had been decided in 1985 to utilise the services of Indian Physicians settled in USA in Continuing Medical Education and Patient Care in India through various schemes. The Medical Council of India was named the nodal agency for collaborating these Schemes and a CME. Cell was set up in the Council office in December, 1985 for this purposes. These Schemes have been extended by the Central Govt., Ministry of Health & Family Welfare in 1993 to involve Indian doctors from

UK and Canada also. These have all been very successful and there is a growing demand for more such programmes to be held on a continuous basis every year.

Further, in November 1999, the Central Govt., Ministry of Health & Family Welfare has also extended its approval to hold the CME Programmes without participation of NRI faculty from USA/UK/Canada. There after the Medical Council of India laid down the detailed guidelines for conducting the CMEs in India.

The **CME guidelines of Gujarat Medical Council** mentions that they will give Credit Points to the registered Medical Practitioners as per the guidelines which is in existence at specific time. A Physician should participate in professional meetings as part of Continuing Medical Education Programs and should earn 30 hours per year or 150 Credit Points for every 5 years.

Gujarat State Medical Council has approved certain bodies or agencies for CME accreditation to standardize the programs and avoid exploitation by non-accredited agencies. Some of the bodies approved are like International, national and state conferences of Professional bodies, National, State, District & City level Scientific Programmes organized by Professional bodies, National, State, District & City level Scientific programmes organized by Indian Medical Association & its Academic Wings, CME / Workshop / training programme conducted by all Government & Private Medical Colleges, etc.

They have laid down the detailed guidelines along with criteria for awarding the credit points. Gujarat Medical Council depute one representative to attend the CME's as an observer and will be treated as "Invited Registered Guest Faculty". This is to monitor the conduct and quality of CME program. The copy of registered delegates has to be submitted with the council for verification during renewal of licensure. Published

Medical text book / Chapter in text book / Research Papers in International & National Index Medical Journals are also considered for the renewal of licensure and detailed criteria for this is also mentioned in the guidelines.

The Dental Council of India had issued the **Continuing Dental Education Regulations 2007** for regulation of CDEs in India. The state dental councils were directed to initiate necessary action with the State governments / legislature to bring about a uniform system of licensure and renewal which can then be merged with the CDE regulations.

The first cycle of implementation of the CDE process was planned for a period of five years i.e. w.e.f. 01st January 2009 to 31st December 2013. The method of online registration of new dentists and renewal of the registration of the dentists in the State, duly linked with the Central body so that the data readily available is to be encouraged. But the Dental Council of India also mentioned that the first phase of implementation was voluntary and the State Dental Councils were advised that no Dentist should be debarred from registration or licensure in the event of his or her not being able to accrue the necessary points in this period.

But due to lack of consensus among the state councils and concerns expressed by some of the senior faculties (**Sivapathasundharam, 2009**), it was never completely implemented.

The Dental Council of India, recently on 5th of September 2018, came out with the gazette notification for **Continuing Dental Education Regulations, 2018**.

They identified "CDE" as any activity in terms of lecture, demonstration, hands-on experience, training for dental professionals and para-dental staff resulting in imparting,

improvement, enhancement, accentuate and advanced knowledge affecting knowledge, skill and attitude of dental professionals for the betterment of patient care and professionalism.

The DCI/MCI recognized teaching institutions having Dental Departments, Government Bodies, Armed Forces were identified as CDE providers. CDE providers such as professional associations and national specialty organizations, will need to apply to the DCI/State Dental Councils for award of CDE points for meetings and conferences held under their aegis and this approval will be valid for a period of 5 years, subject to review.

According to DCI, core objective of the CDE is to enhance the skill and attitude of dentists for the betterment of patient care and professionalism thus it should preferably be held in academic environment, convenient to the participants in terms of timings, fee etc.

They identified various types of CDE programs such as Lectures, Lecture cum demonstration, Live demonstration on patients, Simulation training (with lecture), Videoconferencing, Webinar, Video Lectures with moderator, any hands-on activity for skill enhancement and any other mode which impart, improve, enhance, accentuate and advance knowledge and skill of the professionals as may be prescribed and accepted by the DCI from the time to time.

A CDE credit point system for dentists in India is also proposed. Each and every dentist shall have to secure a total of 100 credit points within a period of every 5 years, provided a minimum of 20 credit points and a maximum of 25 credit points per annum. Out of the 100 credit points in five years, twenty credit points shall be earmarked for the mandatory topics like Asepsis, infection control and waste management including

NACO protocols, Dental jurisprudence & Ethics, CPR and basic life support and Dental Practice Management.

They have also permitted grace period of one year may be awarded to a dentist, who has secured at least 75 CDE points in the allotted time of 5 years, for securing requisite mandatory 100 CDE points.

They have also mentioned about the criteria for allocation of CDE points as well as the exemptions from these mandatory CDE points. The senior dentists with more than 65 years of age, faculty in dental college with more than 15 years of experience, postgraduate students during their post-graduation are exempted.

These regulations also mentions about the formation of the speaker bank. CDE will be conducted by accredited speakers duly approved/registered with Dental Council of India / State Dental Council to conduct CDE programmes. CDE points will be allotted only to programmes conducted by the DCI / State Dental Council accredited speakers.

The Dental Council of India has proposed to develop an Institute based online CDE programmes on basic and emerging areas along with State Dental Councils and CDE point for them will be decided by DCI / State Dental Council accordingly. **(CDE Regulation,2018)**

4.12.13. Regulations, Guidelines and CPD Scenario in other countries

There is an increasing globalisation of dental practice in last two decade. With better mobility of the practitioners and patient, changing trend in global dental education and available of free information resulted in new legal and economic framework. In the light of the same, **Schleyer et al. (2002)** reviewed dental licensure, specialization and continuing education systems in Canada, France, Germany, the UK and the US. The

licensing and re-licensing in these countries is primary responsibility of respective Statutory bodies. In United States and Canada, this responsibility lies with individual states. While in other European Countries, this responsibility rests with countries themselves, within the legal framework of the EU. In some countries, re-licensure requires completion of continuing education credits. In most countries, continuing education is provided by a number of different entities, such as universities, dental associations, companies, institutes and private individuals. Accreditation and recognition of continuing education is primarily process-driven, not outcome-orientated. Some professional organizations, such as the Academy of General Dentistry in the US and the Faculty of General Dental Practitioners in the UK have provided tangible recognition for completing continuing education for some time. They observed that there was no comprehensive, systematic and validated framework for accreditation of CE in any of these countries, neither there was any evidence of these countries or regions moving towards a common and transparent system of tracking continuing education credits.

They suggested few simple goals to steer global framework for the practice of dentistry. They advised that practitioners shall have the opportunity to practise where they choose after meeting reasonable conditions for obtaining a license; quality-assured and relevant continuing education shall be available and accessible to dental practitioners across the globe, and can meet their requirements for maintaining and demonstrating continued competency; and that the meaning of special qualifications (such as a certificate or a degree in a speciality) is transparent to both colleagues and patients.

The **General Dental Council in United Kingdom** has laid down the regulations for CPD with an aim of keeping skills and knowledge up to date throughout the career of

a dental professional. It may also contribute to the delivery of good quality care and service provision, that patients and the public trust is safe and the best it can be.

The Guidelines laid down are very clear and freely available for the professionals the refer. They have very clearly outlined the CPD scheme, Definition of CPD, Minimum CPD hours required, how to maintain the CPD record, etc. They have very clearly demarcated the Verifiable CPD and General or non-verifiable CPD. Verifiable CPD of activity is the one that meets their definition of CPD and for which there is documentary evidence like certificate of attendance can be provided. Such program should have concise educational aims and objectives, clear anticipated outcomes and quality controls. If the CPD activity does not meet all of their requirements for verifiable CPD, but it reasonably advances development of a dental professional and is relevant to the practice, the time spend on the activity can be counted in CPD record but not as verifiable CPD. This is referred as general or non-verifiable CPD.

Usually at the end of each five-year cycle they carry out a CPD audit. As part of this a practitioner is supposed to send full CPD record including documentary evidence of verifiable CPD to check that he/she has met the minimum requirements.

Failure to meet the CPD requirements may result in removal of name from the register. If this happens he/she will not be able to practise in the UK and will not be allowed back on the register until the Council is satisfied that the CPD requirements for restoring the name to the register have been met. There is provision for appeal against the removal of name from the registry. If a practitioner has left the register, or removed from the register for any reason, including for not meeting CPD requirements, he/she must satisfy that he/she has done a certain amount of CPD to be allowed back onto the

register. This means that one must carry on doing and recording CPD even while not on the register. ("CPD requirements," n.d.)

The **American Dental Association's Continuing Education Recognition Program (ADA CERP)** reviews and approves institutions, organizations and individuals that provide continuing dental education.

ADA CERP offers ADA members and the dental community a way to select continuing dental education (CE), while promoting continuous quality improvement in CE. CERP also assists state boards and other organizations that have CE requirements to identify providers that have policies and practices in place to develop and administer CE with a sound scientific basis, in accordance with accepted education and business practices.

To qualify for CERP recognition, CE providers are evaluated in 14 aspects of program quality. Only providers that can meet the ADA CERP Recognition Standards and Procedures are granted recognition and are authorized to use the ADA CERP logo and recognition statement. Once approved, ADA CERP recognized providers must maintain the same high standards and are re-evaluated periodically.

The **Dental Board of Australia** developed guidelines for the requirement of registration standard for continuing professional development (CPD). The registration standard requires that the practitioners must complete a minimum of 60 hours of CPD activities over three years, 80% of the minimum 60 CPD hours must be clinically or scientifically based, make a declaration of their compliance with CPD requirements at the time of annual renewal, maintain their own records detailing their CPD activities for audit purposes and produce evidence of their CPD activities when requested to do so by the Board. The requirements for a practitioner who registers for the first time, or has his or her registration restored after it has lapsed, are also clearly mentioned. These

guidelines apply to all dentists, dental therapists, dental hygienists, dental specialists, oral health therapists and dental prosthetists.

These guidelines provide guidance to dental practitioners about the kinds of activities that will be recognised as CPD and the circumstances in which compliance with the CPD standard will be assessed.

In **Austria,** the CPD is not mandatory. There is an obligation to participate in continuing education, but it is not prescribed as mandatory. The dentist is free to choose the activity he wants to join in. Since 1995, the Austrian dentists must be able to prove that they regularly attend continuing education activities. But so far no sanctions have been imposed. They are having universities, scientific societies, medical or pharmaceutical companies, national and international medical congresses (**Kravitz AS and Treasure ET, 2009**).

In **Belgium**, the continuing professional development is mandatory since 2002. The requirement includes minimum of 60 hours of continue professional development spread over 6 years with a minimum of 20 hours per two-year period. The core topics identified by Belgium college of Dental general practice are General Medicine, Radiology, Prevention, Practice Management, Conservative dentistry, Orthodontics and Prosthodontics. (**Kravitz AS and Treasure ET, 2009**)

In the countries like **Bulgaria, Croatia** and **Czech Republic,** the continuing professional development is mandatory. In **Bulgaria** all the dental practitioners are required to pursue Continuing Dental Education for a minimum of 30 points to be covered in 3 years while in **Croatia** it is 7 hours of formal training each year. The dental practitioners in Croatia have to accumulate 10 points per year for the period of 6 years to renew the licensure for practice. The continuing professional development is

delivered by Bulgarian Dental Association (BDA) and other institutions accredited by BDA while in Croatia continuing education is offered by dental school staff and private organizers. (**Kravitz AS and Treasure ET, 2009**)

The Continuing Professional Development is mandatory in **France** since 2004. The general dental practitioners are required to complete CPD amounting to 800 credits over 5 years with a minimum of 150 credits per year. The professional development programs are mainly conducted by dental schools in France but the practitioner may also attend courses and conferences abroad. National Council for continuing education which oversees the organisations is responsible for approval of the courses before-hand and controls the quality.

Similar to France the continuing education is mandatory in **Germany** since 2004. Dentists in Germany are required to submit evidence of professional development courses attended during the time period of 5 years. It is specified that any CPD activity should last for at least 45 minutes and not more than 8 hours per day. It is worthy to note that in Germany the cost for professional development courses are deductible from income tax as the practice expenses. Various institutions, dental schools and industry supported institutes are responsible for providing continuing education. The content and amount of compulsory continuing education is defined by the respective council. (**Kravitz AS and Treasure ET, 2009**)

In some of the European countries like **Cyprus, Estonia, Finland and Iceland,** the Continuing Professional Development it is not mandatory. They just mention general requirement for the practitioners to keep their skills and knowledge updated. (**Kravitz AS and Treasure ET, 2009**)

For dentists practicing in Greece continuing education is required by law. However, since there is no structured continuing education programme available, there are no sanctions connected with non-compliance. (**Kravitz AS and Treasure ET, 2009**)

In other European countries like **Hungary, Republic of Ireland, Italy, Latvia, Lithuania, Luxembourg, Poland, Portugal,** Continuing Professional Development is mandatory. Each of these countries have mandatory minimum requirement of CPD hours or CPD points to be achieved. **Hungary** has mandatory requirement of 250 points in 5 years amounting to 250 hours of professional development. They also permit reading of scientific articles and research as a part of professional development. **Republic of Ireland** also has a similar requirement of 250 hours of CPD over 5 years and then over each ensuing a 5-year cycle. CPD here is divided into 75 hours of verifiable CPD and 175 hours of CPD undertaken personally. The scientific meetings, annual conferences, hands-on courses, training on CPR as well as overseas courses and conferences are considered as verifiable CPD after production of due certificates for scrutiny. The remaining 175 hours are to be covered by General Reading, Personal study, forming a local study group devoted to particular specific topic, scientific presentations or online information. (**Kravitz AS and Treasure ET, 2009**)

In **Spain,** an extended system of evaluation of a continuing education system is being developed but it is not compulsory. While in **Sweden** continuing education is optional.

In countries like **Netherland** and **Norway** there is no absolute obligation for CPD but dentist have an obligation to treat the patients in accordance with the professional standards based on current knowledge and common accepted procedures at the time. This requires that dentists adopt new knowledge. (**Kravitz AS and Treasure ET, 2009**)

4.12.14. Limitations

The study is delimited to practicing dentists in the state of Gujarat. Hence the population of the study is the practicing dentists in Gujarat and sample selected from within this population. This study can be further done at the larger scale across the country to get the pan-India scenario.

Various parameters were not stratified based on the experience or years of practice of dental practitioners.

Our study attempts to find out the current status of the CDE in the state of Gujarat. There was no direct attempt to assess the needs of the practitioners in the state of Gujarat.

4.12.15. Future Directions

The results of this research will provide baseline information regarding the status of continuing professional development among the Dental Practitioners in Gujarat. Since the dental course, curriculum, regulations are broadly uniform over the country, these results can be extrapolated to the scenario in our country. The regulating bodies, councils and the organizers of professional development programs will be able to formulate appropriate approaches and topics during conducting the courses.