CHAPTER IV

RESULTS

The results of this study are presented as follows:

I. The shear bond strength in each group by means, standard deviations (SD) and ranges (min-max)

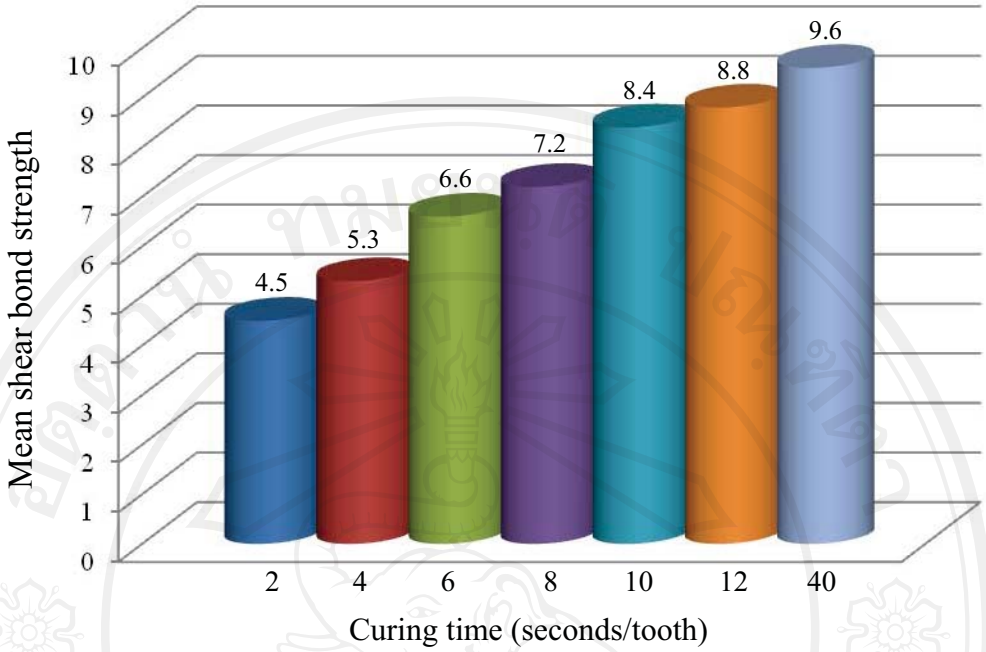
II. The comparison of mean shear bond strength in each group by analysis of variance and the multiple comparisons test

III. The analysis of adhesive remnant index scores by Kruskal Wallis test and frequency

I. The shear bond strength in each group by means, standard deviations (SD) and ranges (min-max)

Table 3 Means, standard deviations and ranges of shear bond strength in each group

Group	Curing time (seconds/ tooth)	Shear bond strength (MPa)	
		Mean ± SD	Min - Max
1	2	4.5 ± 2.1	1.05 – 8.00
2	4	5.3 ± 2.7	1.46 – 11.10
3	6	6.6 ± 2.6	3.57 – 12.98
4	8	7.2 ± 2.7	1.58 – 11.90
5	10	8.4 ± 2.7	2.80 – 13.24
6	12	8.8 ± 3.4	1.47 – 14.11
7 (control)	40	9.6 ± 2.5	3.11 – 12.69



Figures 31 Graph of mean shear bond strength in each group

The results in Table 3 and Figure 31 show that the mean shear bond strength values of Groups 1 to 7 increased as the curing time was extended. The control group had the highest shear bond strength value.

II. The comparison of mean shear bond strength in each group by analysis of variance and the multiple comparisons test

The one-way analysis of variance was used to test for differences of the means of shear bond strength among seven groups. The following assumptions of the analysis of variance were achieved: 1) each sample was selected randomly and independently, 2) distributions of data in each group were normal, examined by a normality test (The Kolmogorov-Smirnov or the Shapiro-Wilk test), and 3) variances

of data in each group were the same, examined by the Levene's test. The one-way analysis of variance and Tukey's test showed significant differences at $p < 0.05$ (Table 4, 5 and 6).

Table 4 Results of Analysis of Variance (ANOVA) of mean shear bond strength

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	419.425	6	69.904	9.548	.000
Within Groups	973.720	133	7.321		
Total	1393.145	139			

Table 5 Statistical comparisons of mean shear bond strength using Tukey's test

Group	N	Subset for alpha = 0.05			
		1	2	3	4
1	20	4.4994285			
2	20	5.2952250	5.2952250		
3	20	6.6028765	6.6028765	6.6028765	
4	20		7.1934535	7.1934535	7.1934535
5	20			8.3477125	8.3477125
6	20			8.7596845	8.7596845
7 (control)	20				9.6380545
Sig.		.183	.293	.160	.072

Means for groups in homogeneous subsets are displayed.

Table 6 Statistically significant differences of mean shear bond strength using Tukey's test

Group	1	2	3	4	5	6	7 (control)
1							
2							
3							
4	*						
5	*	*					
6	*	*					
7 (control)	*	*	*				

* Significant differences at $p < 0.05$

Table 4 shows significant differences in mean shear bond strength values among seven groups at $p < 0.05$. Table 5 and 6 reveal no significant difference in mean shear bond strength values between Groups 1, 2 and 3. The mean shear bond strength value in Group 1 was significantly different from the mean shear bond strength values in Groups 4, 5, 6 and that in the control group. The mean shear bond strength value in Group 2 was significantly different from the mean shear bond strength values in Groups 5,6 and that in the control group. The mean shear bond strength value in Group 3 was significantly different from that in the control group. The mean shear bond strength value in Group 4 was significantly different from that in only Group 1. The mean shear bond strength values in Groups 5 and 6 were significantly different from those of Groups 1 and 2. The mean shear bond strength value in the control group was significantly different from the mean shear bond strength values in Groups 1, 2 and 3.

III. The analysis of adhesive remnant index scores by Kruskal Wallis test and frequency

Table 7 Results of the Kruskal Wallis test for the adhesive remnant index scores

	ARI score
Chi-Square	18.556
df	6
Asymp. Sig.	0.005

Table 8 Frequencies of adhesive remnant index scores (percentages in parentheses)

ARI score / Group	0	1	2	3
1	0 (0%)	10 (50%)	10 (50%)	0 (0%)
2	0 (0%)	10 (50%)	8 (40%)	2 (10%)
3	2 (10%)	12 (60%)	5 (25%)	1 (5%)
4	5 (25%)	11 (55%)	4 (20%)	0 (0%)
5	3 (15%)	14 (70%)	3 (15%)	0 (0%)
6	3 (15%)	14 (70%)	3 (15%)	0 (0%)
7 (control)	2 (10%)	14 (70%)	4 (20%)	0 (0%)

The Kruskal Wallis test showed significant differences in adhesive remnant index scores among seven groups at $p < 0.05$ (Table 7). Adhesive remnant index scores showed that in more than half of the samples in Groups 3, 4, 5 and 6 and in the control group, most adhesive remained on the bracket bases on de-bonding (Table 8). In Groups 1 and 2, ten out of twenty samples (50%) had an adhesive remnant index score of '1'.