

DESCRIPTIVE ANALYSES

This section presents a descriptive and graphical analysis of the main variables included in the study. The normality test for quantitative variables is also reported to determine whether parametric or non-parametric tests should be used in subsequent hypothesis testing.

When the number of observations is greater than 50, the Kolmogorov-Smirnov statistic is considered for the normality test; when the number of observations is below 50, the Shapiro-Wilk statistic is used. If the p value of the normality test is significant ($p < 0.05$), the null hypothesis of normal distribution is rejected and the variable is considered not normally distributed. Conversely, when the p value is not significant ($p > 0.05$), the data may be considered compatible with a normal distribution.

Age	Mean	SD	Lower CI	Upper CI	Median	P25	P75
	47.55	13.30	44.11	50.99	49.50	35.50	58.00

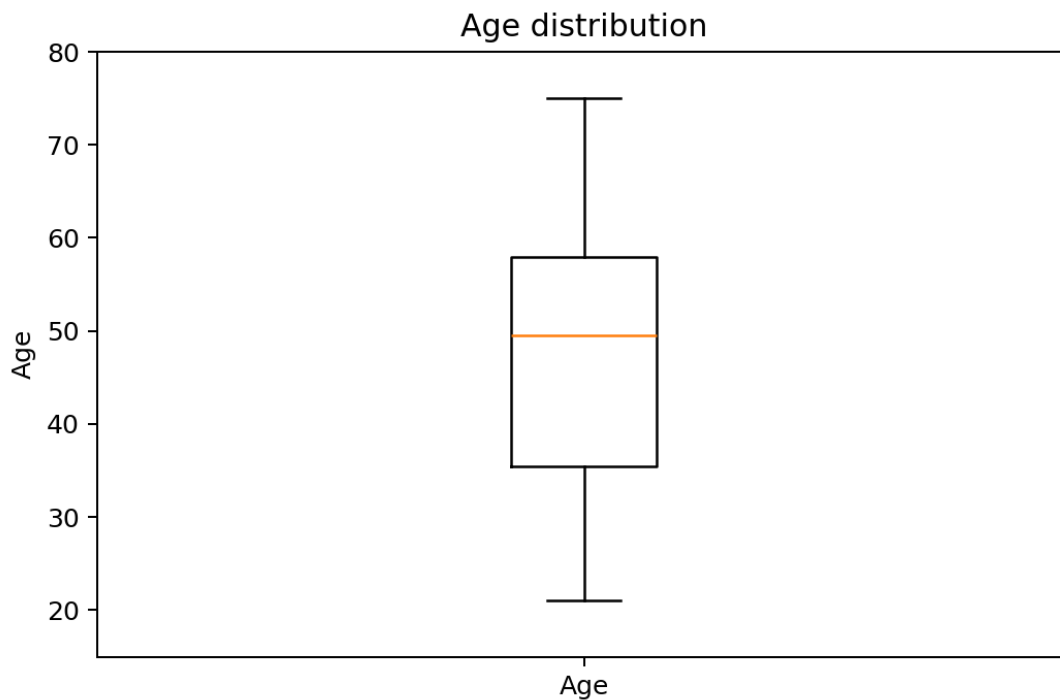


Figure 1. Age distribution.

Variable	Category	N	%
Sex	Male	34	56.7%
Sex	Female	26	43.3%
Tooth type	Premolar	10	16.7%
Tooth type	Molar	50	83.3%
Removal technique	Selective	30	50.0%
Removal technique	Complete	30	50.0%
Pulp exposure	No	36	60.0%
Pulp exposure	Yes	24	40.0%
Preoperative pulp vitality	Negative	0	0.0%
Preoperative pulp vitality	Positive	60	100.0%
Postoperative pulp vitality	Negative	1	1.7%
Postoperative pulp vitality	Positive	59	98.3%
Pulp vitality at 6 months	Negative	11	18.3%
Pulp vitality at 6 months	Positive	49	81.7%
Restoration success	No	11	18.3%
Restoration success	Yes	49	81.7%

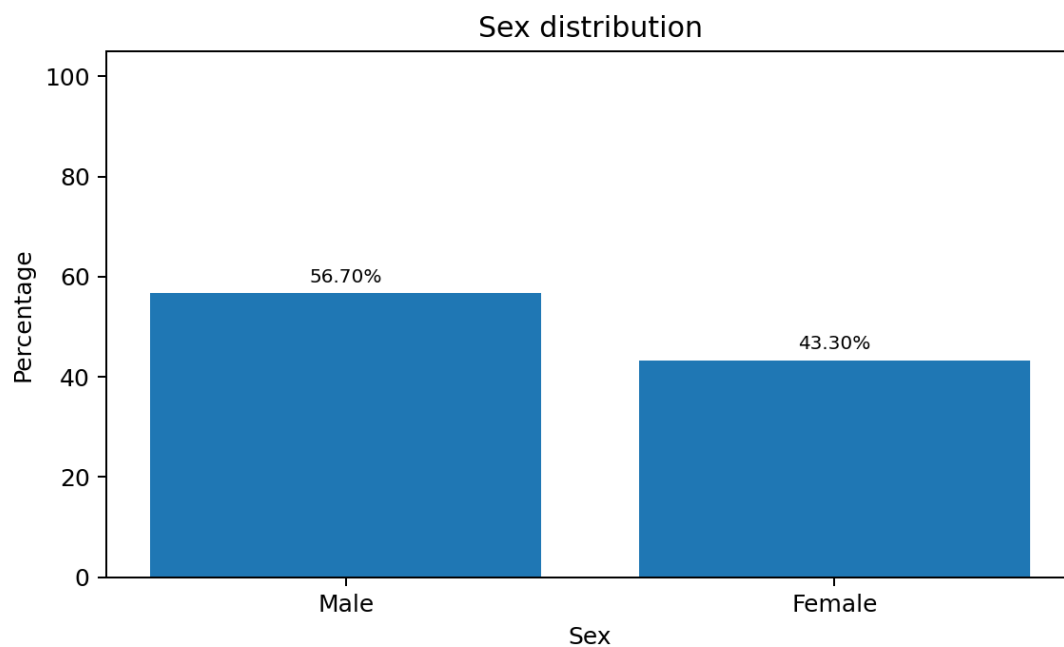


Figure 2. Sex distribution.

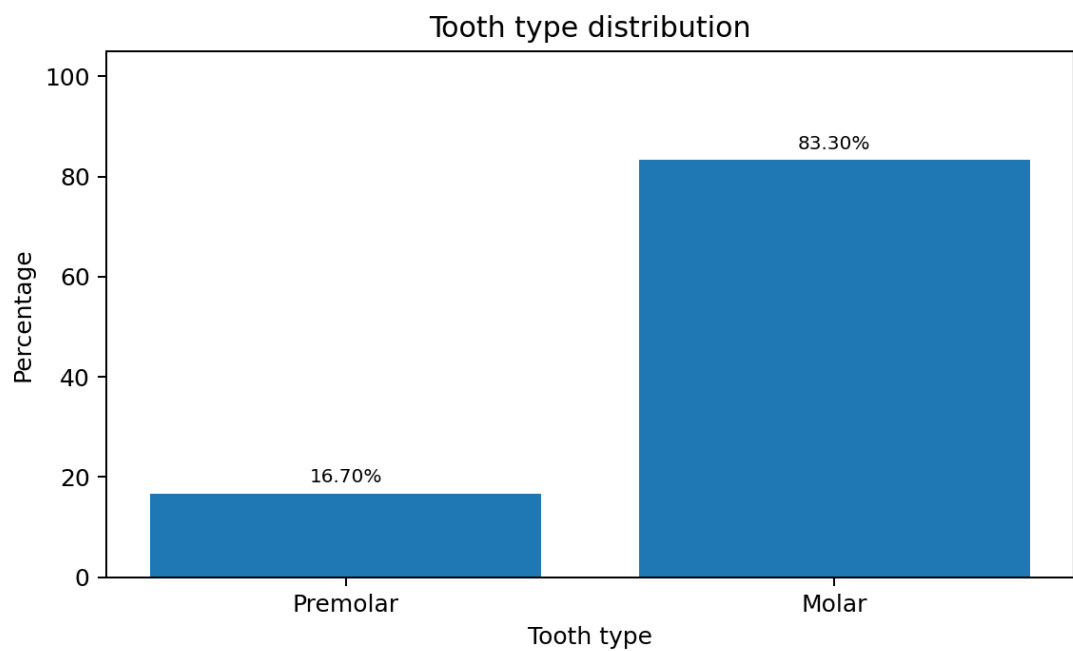


Figure 3. Tooth type distribution.

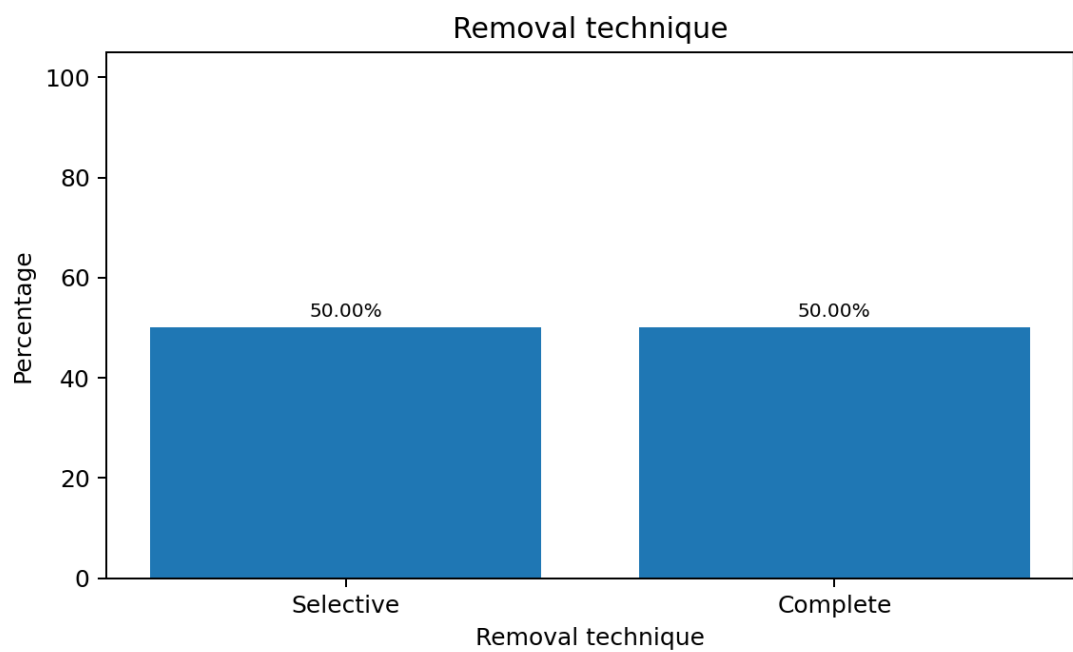


Figure 4. Distribution by removal technique.

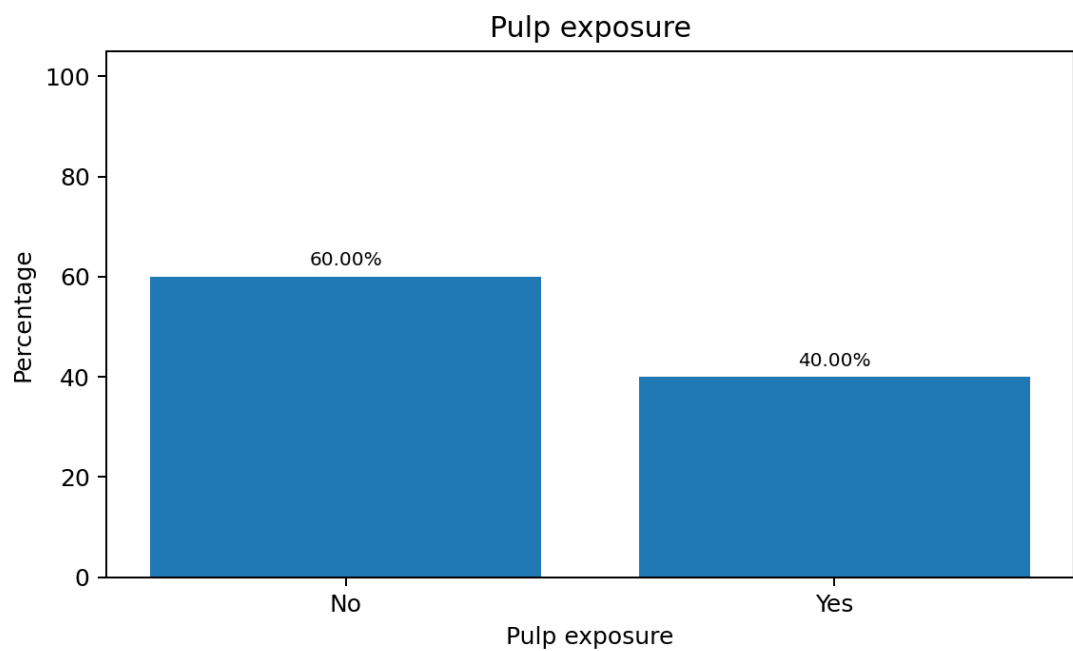


Figure 5. Pulp exposure.

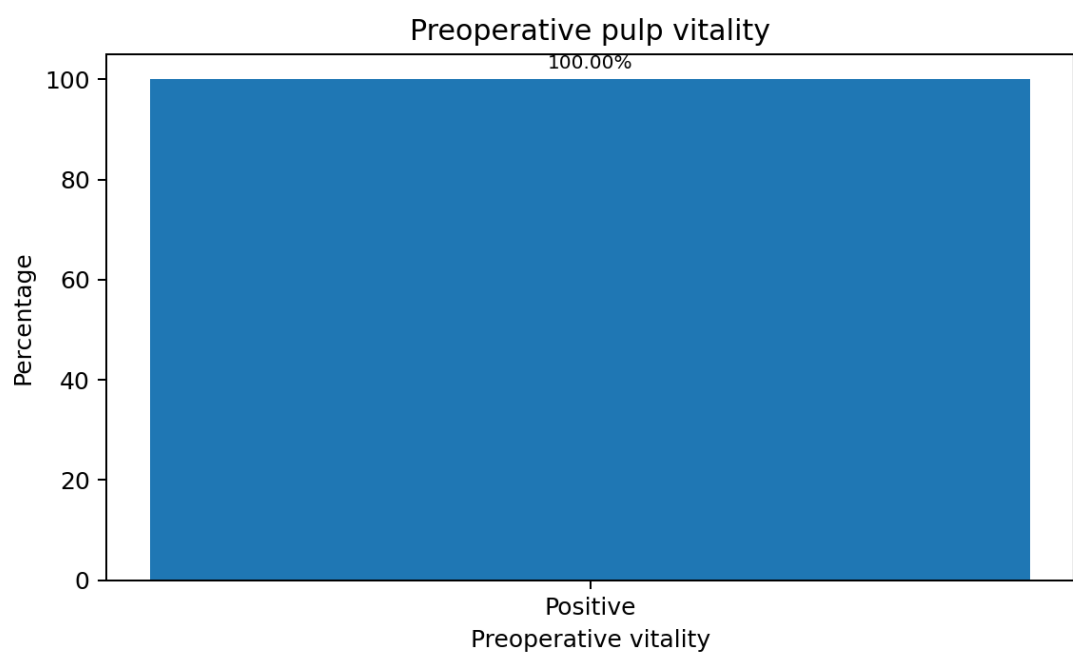


Figure 6. Preoperative pulp vitality.

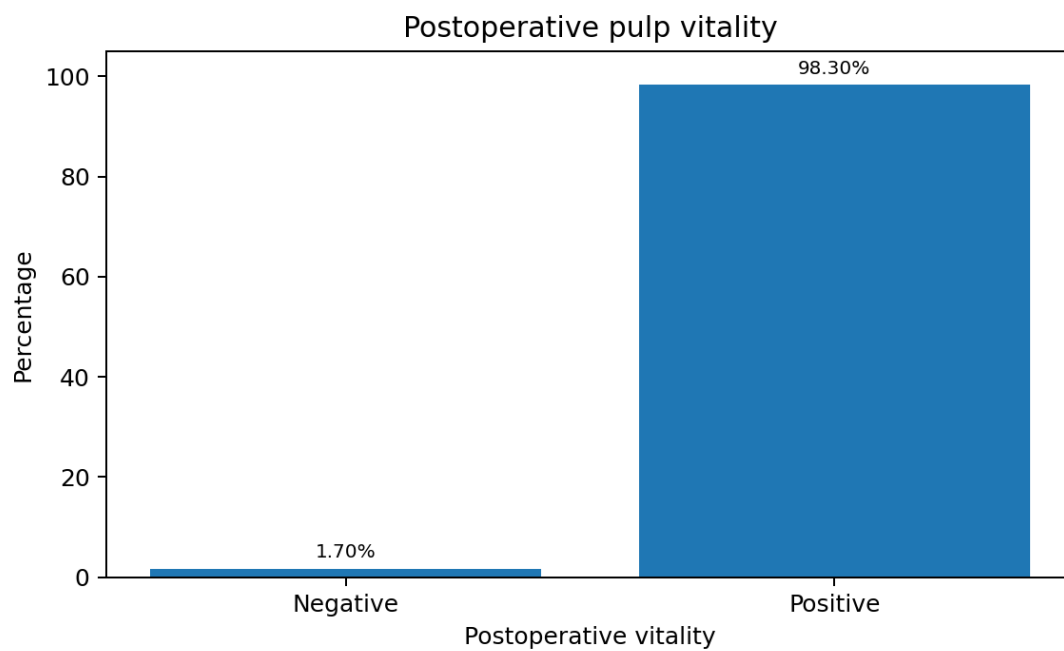


Figure 7. Postoperative pulp vitality.

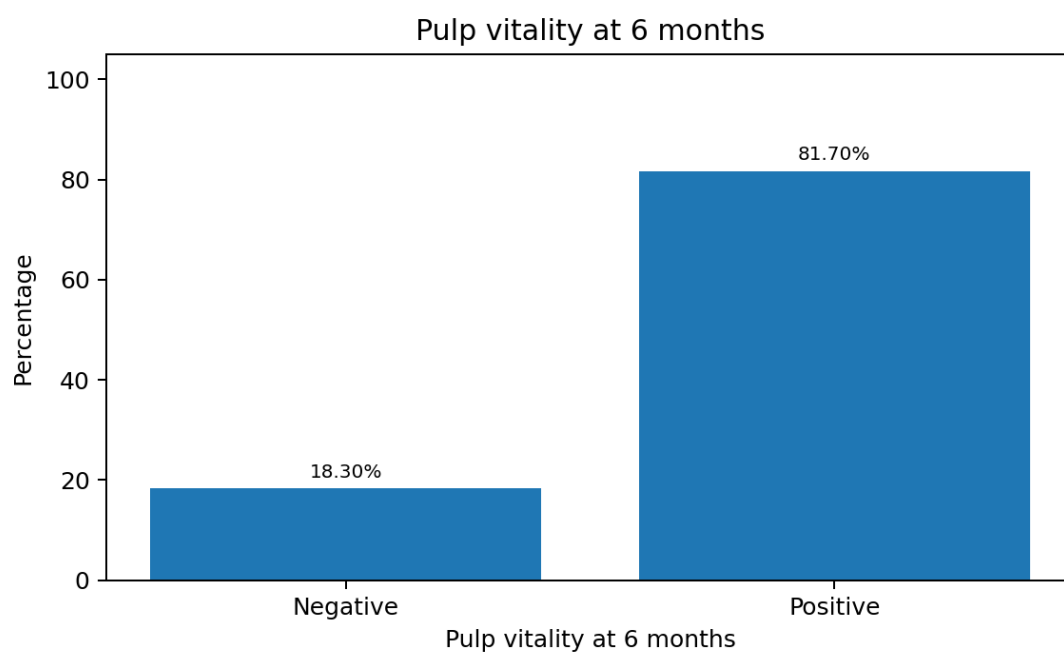


Figure 8. Pulp vitality at 6 months.

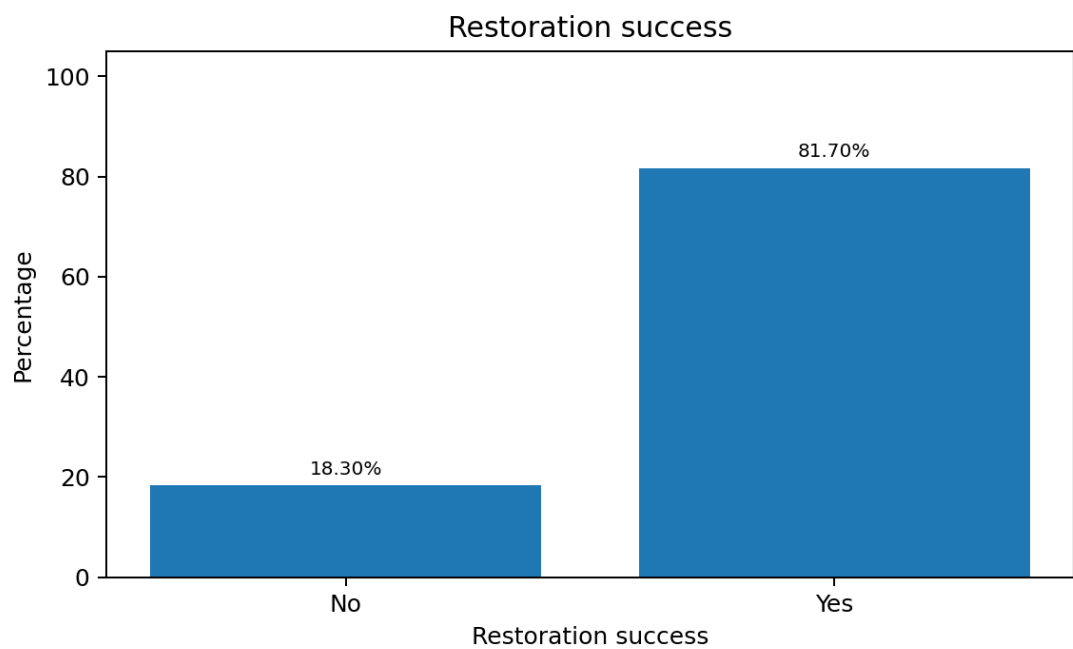


Figure 9. Restoration success.

HYPOTHESIS TESTING

INDEPENDENCE TESTS

This section assesses whether the main study variables are independent of selected factors. For quantitative variables, mean values are compared across the groups defined by qualitative or categorical variables.

Different independence tests are used depending on whether the quantitative variable follows a normal distribution within the categories of the qualitative variable. Parametric tests are used when the assumption of normality is met, whereas non-parametric tests are used when it is not. The type of test also depends on whether the categorical variable has two categories or more than two categories.

Among parametric tests, Student's t-test is used when the categorical variable has two categories, while analysis of variance (ANOVA) is used when it has three or more categories. Before applying a parametric test, Levene's test for homogeneity of variances is performed. Among non-parametric tests, the Mann-Whitney U test is used for two categories and the Kruskal-Wallis test for three or more groups. When independence between two qualitative variables is assessed, the chi-square test is applied.

All statistical tests were performed at a 95% confidence level using IBM SPSS Statistics version 29.0.

Factor	Category	Mean age	SD	Mann-Whitney p value
Removal technique	Selective	48.90	13.19	0.412
Removal technique	Complete	46.20	13.50	
Pulp exposure	No	47.39	13.72	0.994
Pulp exposure	Yes	47.79	12.94	
Restoration success	No	51.00	16.16	0.450
Restoration success	Yes	46.78	12.64	

In the independence tests, when the p value is not significant ($p > 0.05$), there is no statistically significant difference in mean age between groups at the 95% confidence level.

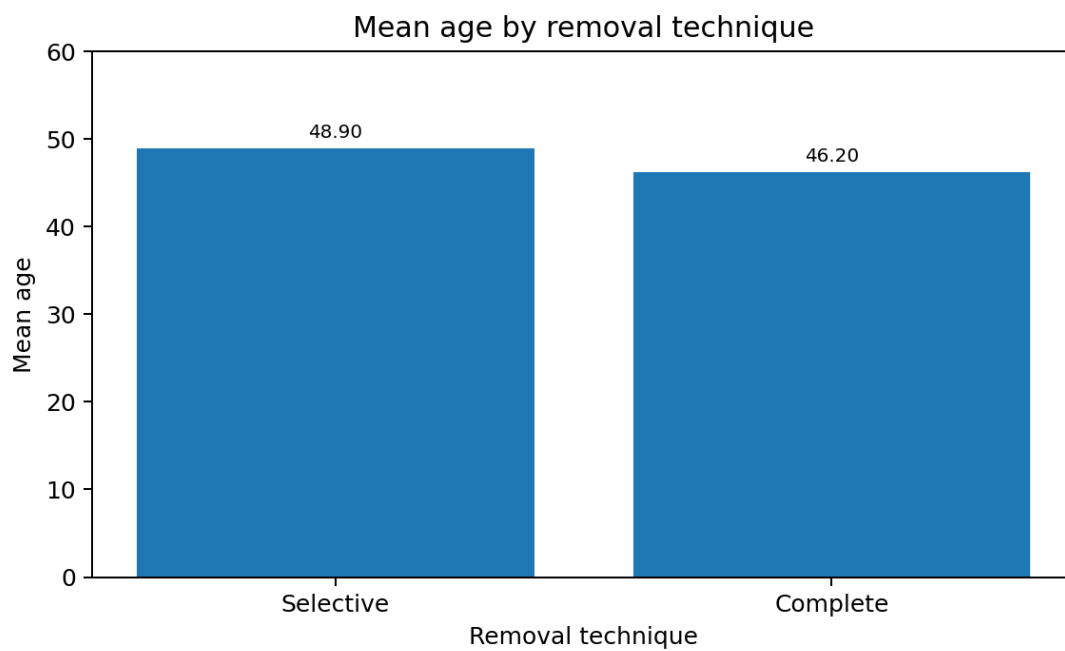


Figure 10. Mean age by removal technique.

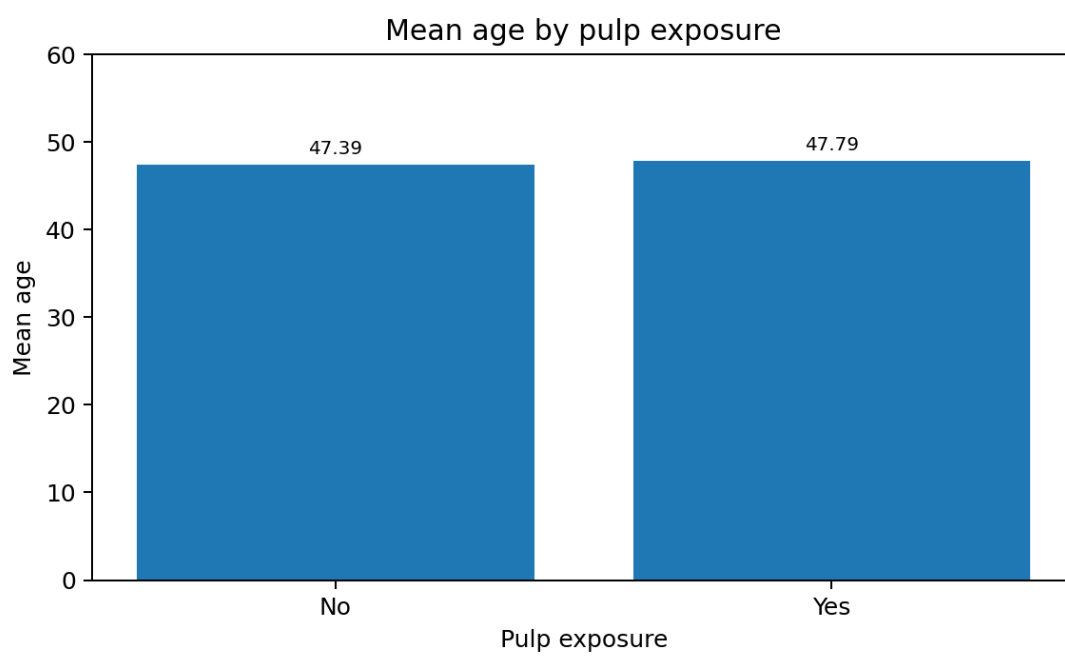


Figure 11. Mean age by pulp exposure.

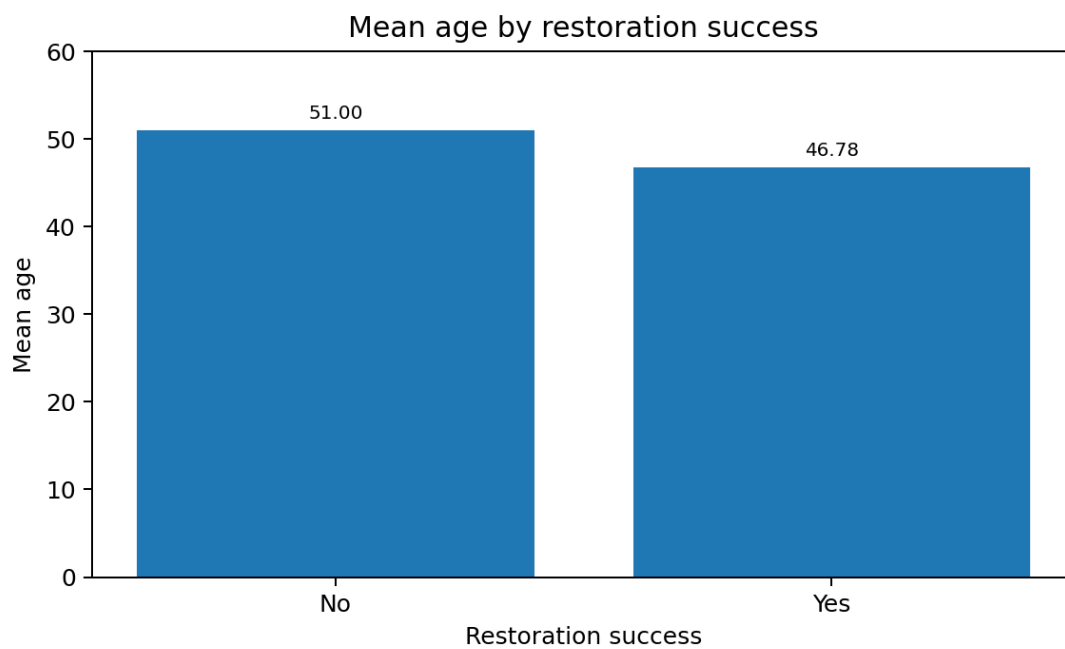


Figure 12. Mean age by restoration success.

Variable	Category	Selective n	Selective %	Complete n	Complete %	Chi-square p value
Sex	Male	16	53.3%	18	60.0%	0.602
Sex	Female	14	46.7%	12	40.0%	
Tooth type	Premolar	4	13.3%	6	20.0%	0.488
Tooth type	Molar	26	86.7%	24	80.0%	
Pulp exposure	No	17	56.7%	19	63.3%	0.598
Pulp exposure	Yes	13	43.3%	11	36.7%	
Preoperative pulp vitality	Negative	0	0.0%	0	0.0%	0.999
Preoperative pulp vitality	Positive	30	100.0%	30	100.0%	
Postoperative pulp vitality	Negative	0	0.0%	1	3.3%	0.313
Postoperative pulp vitality	Positive	30	100.0%	29	96.7%	
Pulp vitality at 6 months	Negative	3	10.0%	8	26.7%	0.045*
Pulp vitality at 6 months	Positive	27	90.0%	22	73.3%	
Restoration success	No	3	10.0%	8	26.7%	0.045*
Restoration success	Yes	27	90.0%	22	73.3%	

When the p value of the chi-square independence test is not significant ($p > 0.05$), no statistically significant association between the variables is observed at the 95% confidence level. When the p value is significant ($p < 0.05$), the null hypothesis of independence is rejected and a statistically significant association between the variables is considered present.

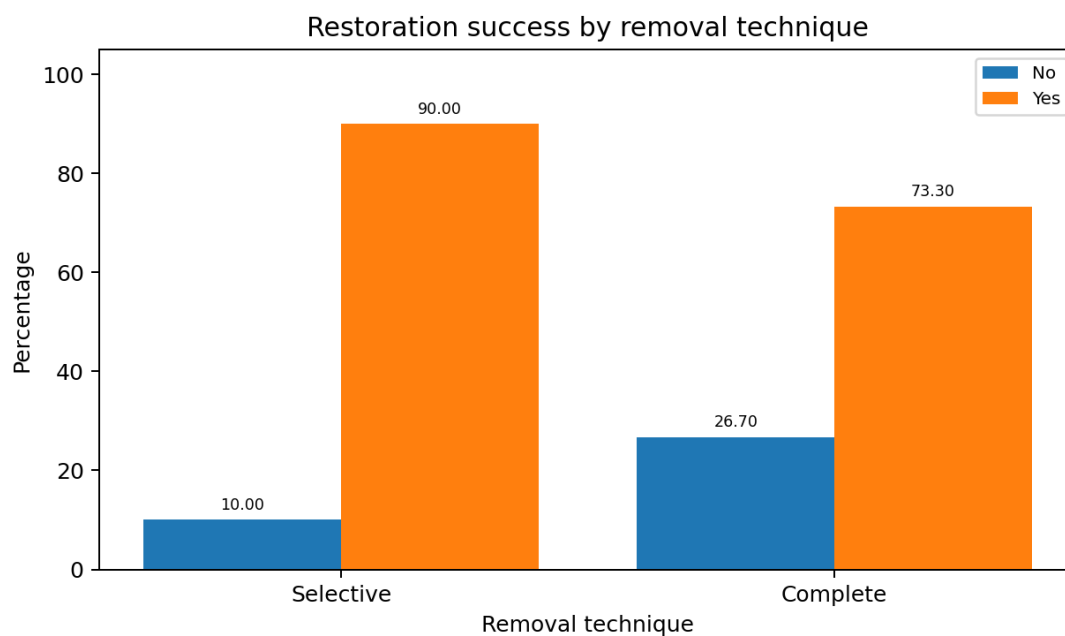


Figure 13. Restoration success by removal technique.

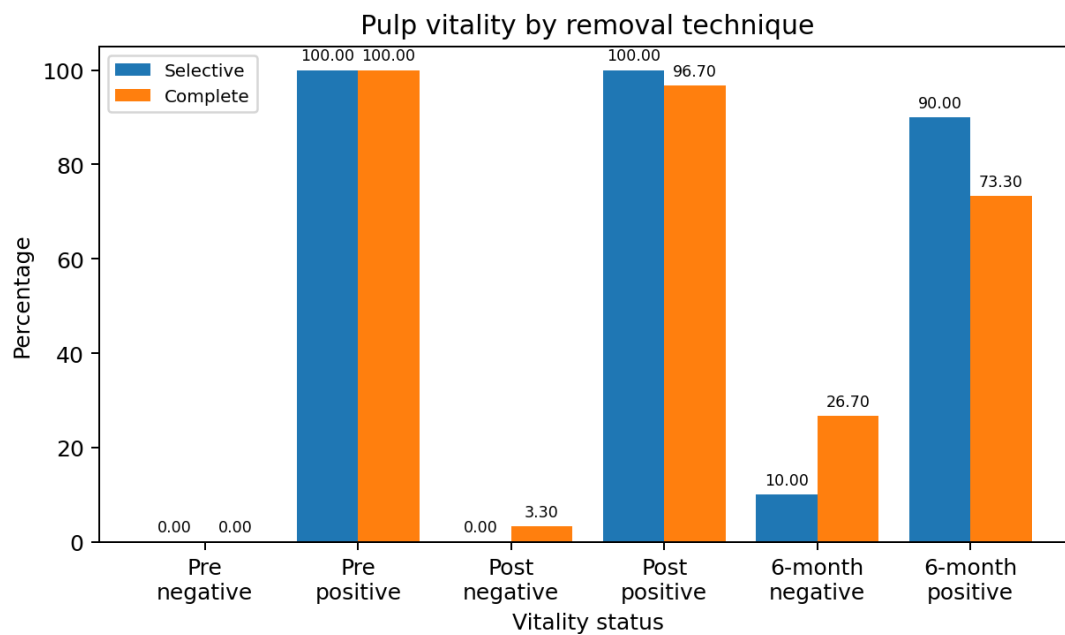


Figure 14. Pulp vitality by removal technique.

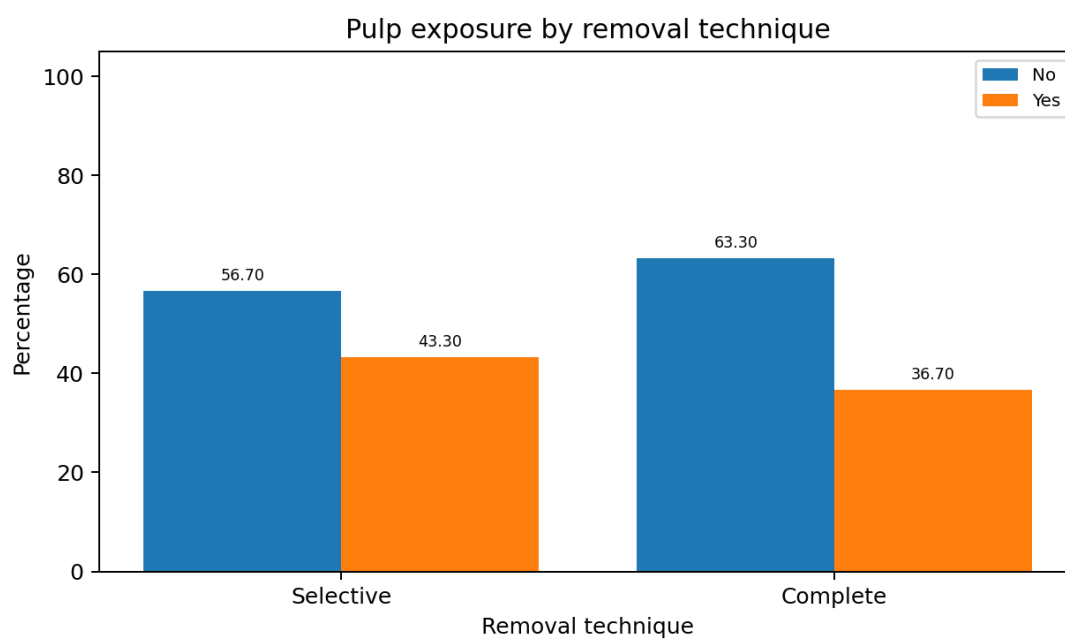


Figure 15. Pulp exposure by removal technique.

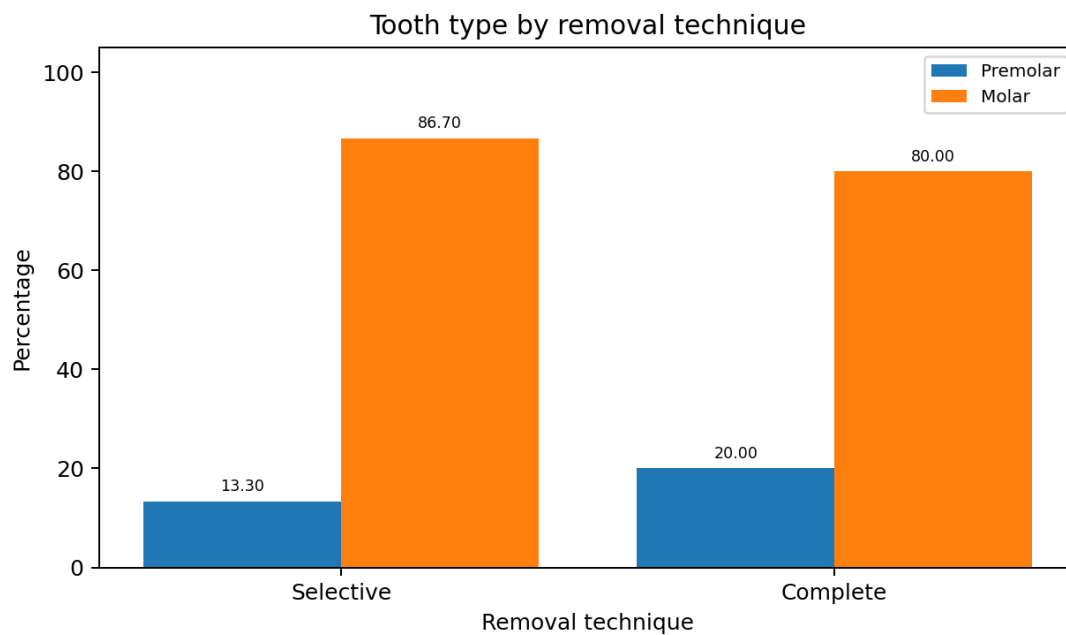


Figure 16. Tooth type by removal technique.

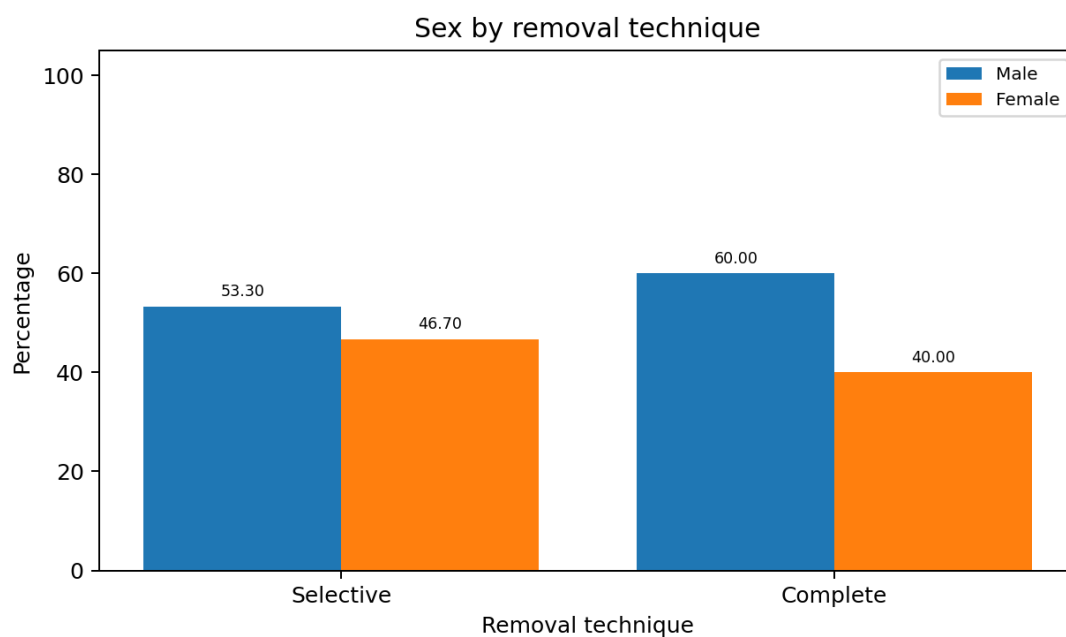


Figure 17. Sex by removal technique.

Variable	Category	Male n	Male %	Female n	Female %	Chi-square p value
Pulp exposure	No	23	67.6%	13	50.0%	0.167
Pulp exposure	Yes	11	32.4%	13	50.0%	
Preoperative pulp vitality	Negative	0	0.0%	0	0.0%	0.999
Preoperative pulp vitality	Positive	34	100.0%	26	100.0%	
Postoperative pulp vitality	Negative	0	0.0%	1	3.8%	0.249
Postoperative pulp vitality	Positive	34	100.0%	25	96.2%	
Pulp vitality at 6 months	Negative	6	17.6%	5	19.2%	0.875
Pulp vitality at 6 months	Positive	28	82.4%	21	80.8%	
Restoration success	No	6	17.6%	5	19.2%	0.875
Restoration success	Yes	28	82.4%	21	80.8%	

When the p value of the chi-square independence test is not significant ($p > 0.05$), no statistically significant association between the variables is observed at the 95% confidence level. When the p value is significant ($p < 0.05$), the null hypothesis of independence is rejected and a statistically significant association between the variables is considered present.

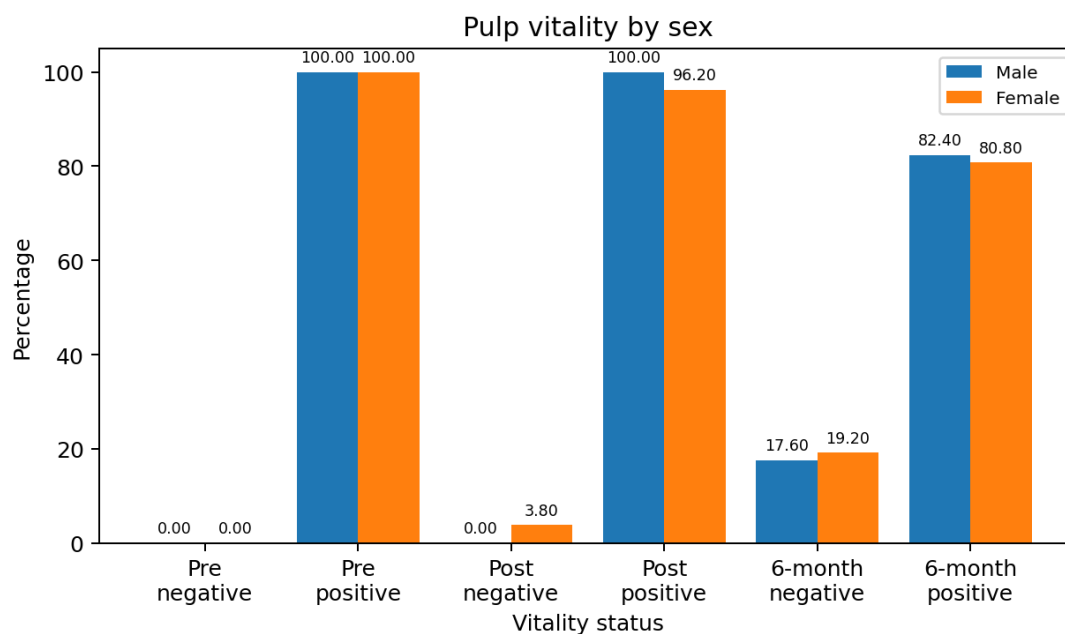


Figure 18. Pulp vitality by sex.

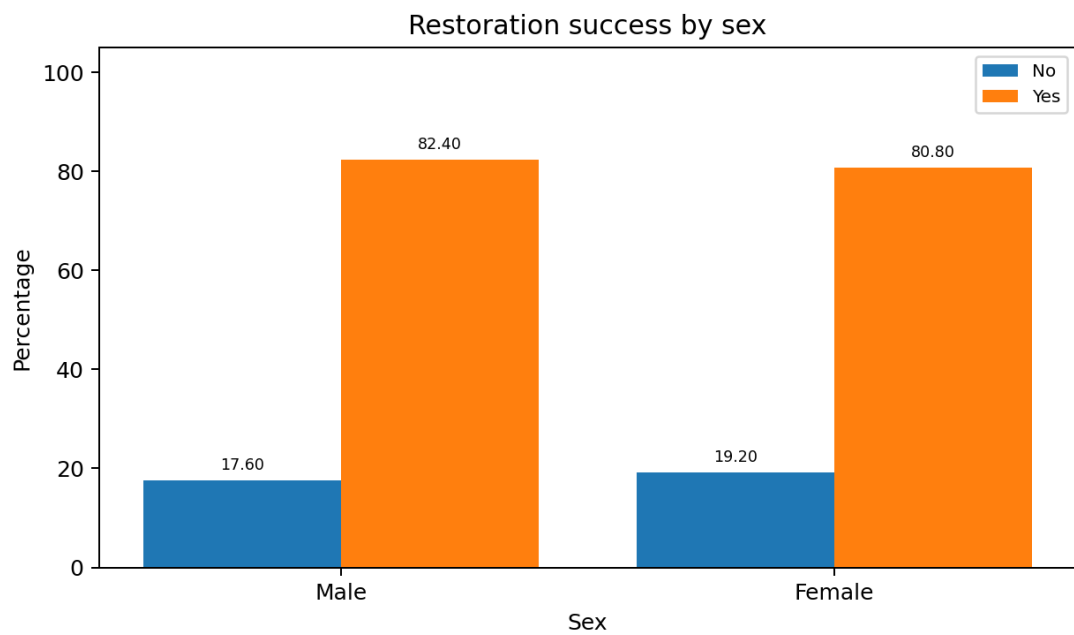


Figure 19. Restoration success by sex.

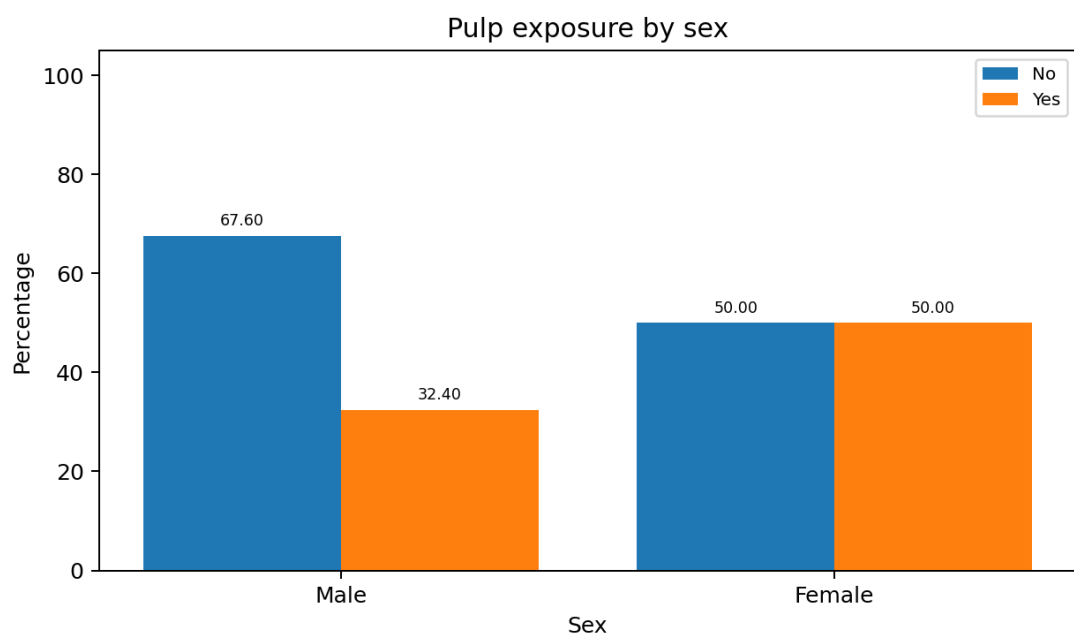


Figure 20. Pulp exposure by sex.

RELATED-SAMPLES TESTS

This section assesses whether statistically significant differences can be detected between the PRE and POST status of the study variables. For binary data, McNemar's test was used. This test is commonly applied in repeated-measures designs, where each subject's response is obtained twice: before and after a specified event. McNemar's test determines whether the initial response rate is equal to the final response rate and is useful for detecting changes in responses caused by an experimental intervention in before-after designs.

In related-samples tests, when the p value is significant ($p < 0.05$), a statistically significant difference in the response distribution between the PRE and POST status is considered present at the 95% confidence level.

Removal technique	Preoperative vitality	Postoperative negative n (%)	Postoperative positive n (%)	Total n (%)	McNemar p value
Selective	Positive	0 (0.0%)	30 (100.0%)	30 (100.0%)	1.000
Complete	Positive	1 (3.3%)	29 (96.7%)	30 (100.0%)	1.000
Total	Positive	1 (1.7%)	59 (98.3%)	60 (100.0%)	1.000

Table. McNemar test comparing preoperative and postoperative pulp vitality.

Removal technique	Preoperative vitality	6-month negative n (%)	6-month positive n (%)	Total n (%)	McNemar p value
Selective	Positive	3 (10.0%)	27 (90.0%)	30 (100.0%)	1.000
Complete	Positive	8 (26.7%)	22 (73.3%)	30 (100.0%)	1.000
Total	Positive	11 (18.3%)	49 (81.7%)	60 (100.0%)	1.000

Table. McNemar test comparing preoperative and 6-month pulp vitality.

Removal technique	Postoperative vitality	6-month negative n (%)	6-month positive n (%)	Total n (%)	McNemar p value
Selective	Positive	3 (10.0%)	27 (90.0%)	30 (100.0%)	1.000
Complete	Negative	1 (100.0%)	0 (0.0%)	1 (100.0%)	0.342
Complete	Positive	7 (24.1%)	22 (75.9%)	29 (100.0%)	
Complete total		8 (26.7%)	22 (73.3%)	30 (100.0%)	
Overall	Negative	1 (100.0%)	0 (0.0%)	1 (100.0%)	0.654
Overall	Positive	10 (16.9%)	49 (83.1%)	59 (100.0%)	
Overall total		11 (18.3%)	49 (81.7%)	60 (100.0%)	

Table. McNemar test comparing postoperative and 6-month pulp vitality.