Comprehensive Analysis

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This is the comprehensive analysis report for the Project 0 Dental Data. This study is interested in the effect of a gel treatment on gum health as measured by attachment loss and pocket depth. Measurements for both outcomes were taken at a wide variety of sites and averaged to determine a whole mouth value. Measurements were collected at baseline before treatment began and after one-year of treatment. The study participants were randomly assigned to one of five-treatment groups - no-treatment (no-gel), gel only (no-active ingredient/placebo), low dose, medium dose, high dose. Race characteristics were collapsed into white and non-white due to the small sizes of the non-white race groups. The characteristics of each group are shown in Table 1. To confirm random assignment, categorical variables were tested using χ^2 and Fisher's Exact and continuous variables were tested using ANOVA. p-values are shown in Table 1.

Table 1: Characteristics of Study Participants by Treamtment Group

	No Treatment (n=23)	Placebo (n=22)	Low (n=21)	Medium (n=19)	High (n=16)	p-value
	N(%)	N(%)	N(%)	N(%)	N(%)	
Sex						0.45
Female	16(70)	12(55)	12(57)	13(68)	13(81)	
Smoker						0.71
Yes	7(30)	10(45)	6(29)	8(42)	5(31)	
Race						0.77
White	20(87)	20(91)	17(81)	18(95)	14(88)	
	Mean(SD)	Mean(SD)	Mean(SD)	Mean(SD)	Mean(SD)	
Age	51(10)	47(9)	51(10)	49(10)	53(11)	0.40
No of Sites	154(11)	161(10)	162(8)	156(15)	158(9)	0.10
Baseline Attachment	3(1)	2(1)	2(1)	2(1)	2(1)	0.02
Baseline Pocket Depth	3(0)	3(0)	3(1)	3(0)	3(0)	0.44

The only potential covariate with a significant relationship to the exposure was attachment loss at baseline. This would also be expected to effect outcome and was therefore adjusted for in the final model.

Attachment Loss

Due to problems with normality and homoscedasticity, the outcome was log transformed for the crude analysis. There was a significant difference in treatment groups when looking at attachment loss (p=0.0107), but further analysis showed the only significant difference from no-treatment was with the placebo group (Table 2). There was no significant difference between treatment groups after adjusting for baseline, number of sites used, smoking status and gender (p=0.1111).

Table 2: Crude Model of Attachment Loss

	Estimate	t value	Pr(>|t|)
Intercept	0.8175	12	8.227e-21
Placebo	-0.3315	-3.403	0.0009735
Low	-0.1804	-1.83	0.07041
Medium	-0.03994	-0.3944	0.6942
High	-0.1288	-1.211	0.2288

Pocket Depth

Due to problems with normality and homoscedasticity, the outcome was log transformed for the crude analysis. There was no significant difference in treatment groups when looking at pocket depth (p=0.3322). There was no significant difference between treatment groups after adjusting for baseline, number of sites used, and smoking status (p=0.1046).

Appendix: Missing Data

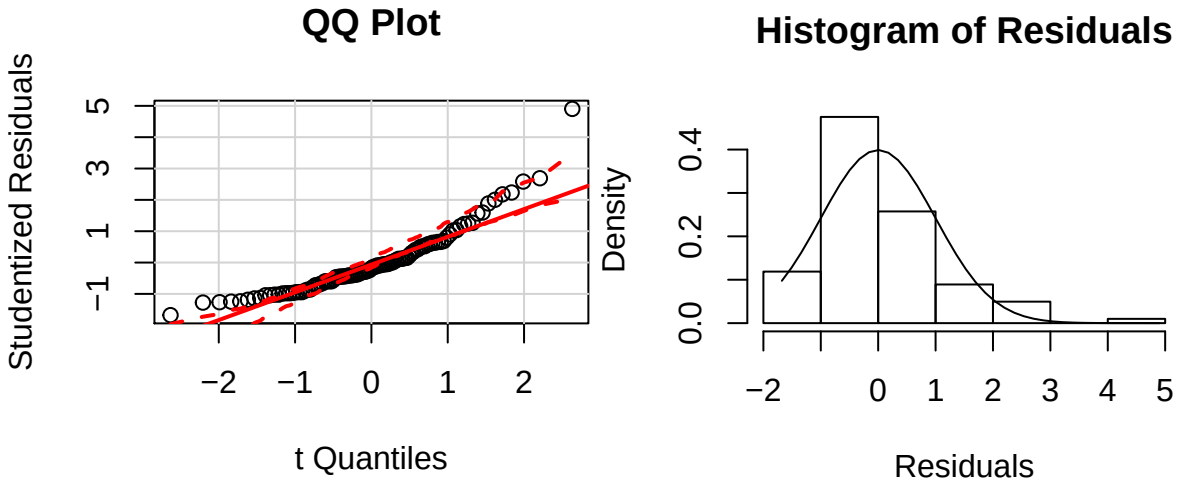
29 observations were excluded due to missing data.

Table 3: Number of Missing Values by Treatment Group

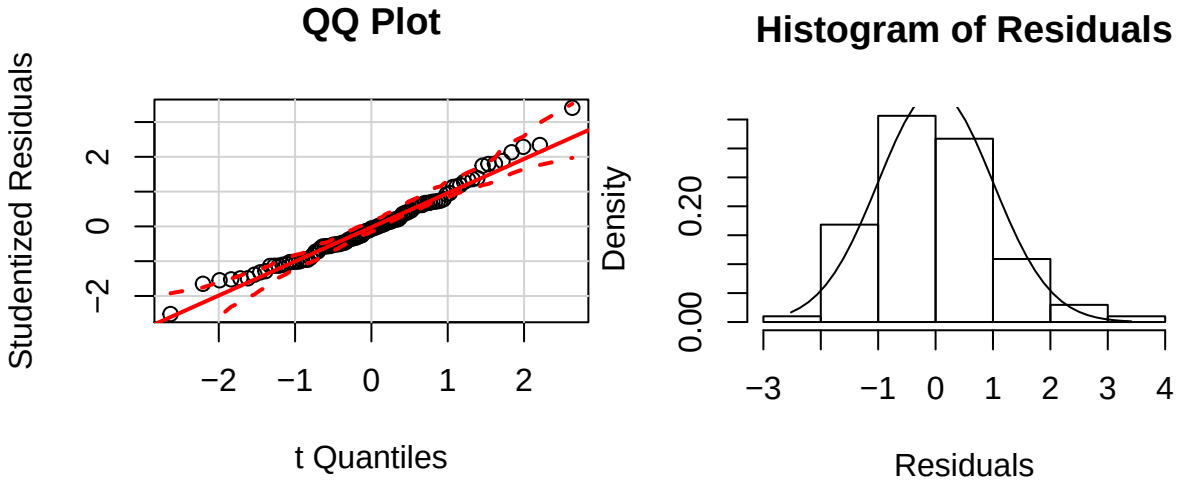
trtgroup	attach1year	pd1year	age	smoker
1	3	3	1	0
2	3	3	0	0
3	5	5	0	0
4	6	6	0	1
5	10	10	0	0

Appendix: Diagnostic Plots

Diagnostic Plots of Attachment Loss vs Treatment Group



Diagnostic Plots of Log Transformed Attachment Loss vs Treatment Group



Diagnostic Plots of Pocket Depth vs Treatment Group

Diagnostic Plots of Log Transformed Pocket Depth vs Treatment Group