



Sample analysis: ANOVA for randomised control trials

Background

This is a randomised control trial to examine the effectiveness of a weekly counselling program as an intervention to aid weight loss. Participants were randomly allocated to either the control group (no counselling) or the intervention group (weekly counselling). The outcome measured was BMI which was measured when the trial began (baseline), after 1 month, 2 months, 3 months and 12 months.

Analyses conducted

The data were analysed using a mixed design ANOVA (analysis of variance). The dependent (outcome) variable was the participant's BMI. There were two independent variables (manipulations). The first independent variable was the group that participants were allocated to: either the control group or the treatment group (independent measures design). The second independent variable was the time at which the BMI was measured (repeated measures design).

This method of analysis is advantageous as it allows us to analyse the interaction between group and time. That is, we would expect the patterns of weight loss to differ between the control and the treatment groups. Consequently, we would predict a significant interaction.

Results

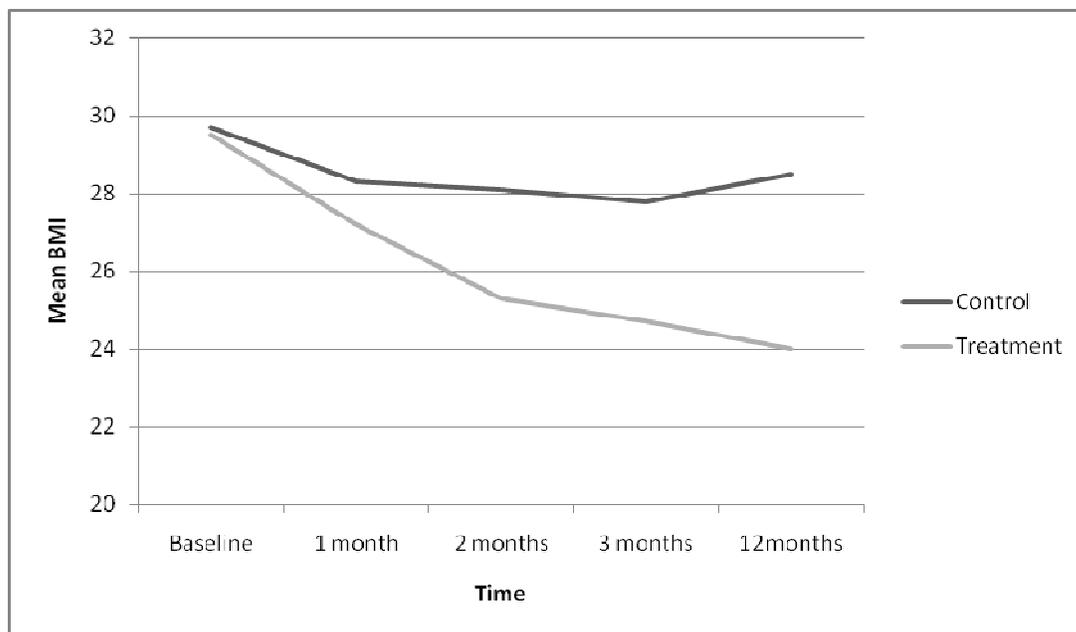
	Control group		Treatment group		Comparison between groups
	Mean	SD	Mean	SD	
Baseline	29.7	2.9	29.5	4.8	t (28) = 0.1, p = .892
1 month	28.3	2.9	27.2	3.9	t (28) = 0.9, p = .376
2 months	28.1	3.0	25.3	3.7	t (28) = 2.3, p = .031
3 months	27.8	2.6	24.7	2.8	t (28) = 3.1, p = .004
12 months	28.5	2.8	24.0	2.5	t (28) = 4.6, p < .001

At the beginning of the trial there was no difference in BMI between the two groups. This lack of difference still existed one month into the trial. However, from two months onwards, the BMI was significantly lower in the treatment group than in the control group.

The ANOVA showed a significant effect of time ($F(4, 112) = 42.9, p < .001$). This main effect combines the changes in BMI across both the control and the treatment group combined. Overall, there was a significant reduction in BMI from baseline to one month ($p < .001$), from one to two months ($p < .001$). From two to three months, there was a trend towards a reduction in BMI ($p = .099$) and there was no change from three to twelve months ($p = .852$). It should be noted that this is combined across the two groups and the pattern of weight loss may differ between the groups.

There was also a main effect of group ($F(1, 28) = 4.3, p = .049$). This means that, combined across all of the time points, the BMI of the treatment group (mean = 26.1) was significantly lower than the BMI of the control group (mean = 28.5).

The key aspect of the analysis to assess the effectiveness of the randomised control trial is whether there is a significant interaction between group and time. This finding would show that the pattern of changes in BMI over time differs between the two groups.



There was a significant interaction between group (control vs. treatment) and time ($F(4, 112) = 15.4, p < .001$). This means that participants in the control and treatment groups experienced different patterns of BMI change during the study.

For participants in the control (no counselling) group, there was a significant reduction in BMI from baseline to one month later ($p < .001$). There was then no significant change from one month to two months ($p = .533$) or from two to three months ($p = .369$). There was then a significant rise in BMI from three to twelve months after the trial began ($p = .013$). This pattern suggests that individuals in the control group achieved initial weight loss, but this only occurred in the first month of the trial. After the first month there was no change in BMI for two months and by twelve months BMI increased again. However, it is interesting to note that there is a trend towards the BMI at 12 months being lower than it was at the beginning of the trial ($p = .067$).

For participants in the treatment (counselling) group, there was a significant decrease in BMI from baseline to one month ($p < .001$), from one month to two months ($p < .001$), there was no change from two months to three months ($p = .132$) but then there was a further significant reduction in BMI by twelve months later ($p = .007$). BMI at the end of the trial was significantly lower than at the beginning of the trial ($p < .001$).

Summary

- The aim of this randomised control trial was to evaluate the efficiency of a weekly counselling program for weight loss. BMI was measured before the trial and after 1, 2, 3 and 12 months.
- Participants in the control group did lose weight in the first month of the trial, however there was no further weight loss and by the end of the trial BMI was only slightly lower than at the beginning of the trial. This suggests that weight loss is not maintained in the control group.
- Participants in the treatment group lost weight consistently, other than between the second and third month. In this group the BMI changed from 29.5 (borderline overweight/obese) to 24 (within the normal range).