The Effects of ASMR on Stress Levels and Loneliness in Teenage Girls.

Introduction

Autonomous Sensory Meridian Response or ASMR is described as an euphoric, warm tingling sensation starting at the scalp and spreading down the body. This natural phenomenon is caused by auditory or visual stimuli such as someone whispering, tapping on objects with long nails, flipping newspaper, folding towels etc. The stimuli that cause this are known as 'triggers'. To date, there has been very little research into ASMR, let alone the effects it has on stress and loneliness.

ASMR is said to help with insomnia and can be relaxing as 70% of people who listen to ASMR regularly, listen to ASMR for stress relief.[1] Meditation is also said to reduce stress levels and heart rate so can ASMR do the same? Core temperature in humans rises when in stressful situations, but in certain locations on the skin such as fingertips and finger base see a decrease in temperature. There are no past studies proving that ASMR leads to a reduction in temperature but it is worth experimenting to see if ASMR also reduces temperature, since that is affected by stress.

Our project is to discover the effects of ASMR on stress levels and loneliness in teenage girls. In our experiment we measured change in heart rate, skin temperature, loneliness [2] and perceived stress [3] levels using surveys taken from peer-reviewed research.

Materials and methods

We picked 4 classes per year group (1st, 2nd, 3rd and 4th year) aged 12-16. We divided each year into 4 groups (ASMR spoken, ASMR sound only, Meditation and Negative Control):

- ASMR video (sound only): someone tapping/scratching different objects
- ASMR video (spoken): spoken roleplay; consisted of a Victorian themed eye-exam
- Positive Control (Guided meditation video): soft-spoken mindfulness meditation with sounds of a river and birds singing in the background. Some participants closed their eyes for this.
- Negative Control: Makeup tutorial video (without ASMR triggers)

Each group had 70 students, totalling it into 280 students. We went around to each of the groups. Heart rate of the participants was measured before and after watching one of the videos. Their temperature was taken after the video with a non-contact thermometer. Finally, participants were asked to fill in a survey. This consisted of general questions about their mood, the Perceived Stress Scale (PSS) and the UL-8 loneliness scale.[1] The PSS asks questions about how you felt over the last month, loneliness scale asks how often you've felt (PSS= Never, Almost Never, Sometimes, Fairly Often and Very Often. UL-8= Never, Rarely, Sometimes and Often) a certain way in response to a specific statement. e.g 'I lack companionship'. Their scores were added up to give a PSS score and loneliness scale score.

Results and Analysis

One-Way ANOVA and Post-hoc Tukey test of skin temperature, Loneliness score, Perceived Stress score and a Paired t-test for the heart rate, for the treatment groups (ASMR/non-ASMR/Mindfulness/Control) (Table 1)

	Spoken ASMR (G2)	Mindfulness meditation (G3)	Control (G4)
Sound only ASMR (G1)	change in HR = sig. G1 (+1.63) < G2 (+2.11) Temperature = sig. G2 (36.84) > G1 (36.69) PSS = not sig. UL-8 = sig. G1 (18.73) < G2 (20.23) change in HR = sig. G1 (+1.63) < G2 (+2.11)	change in HR = sig. G1 (+1.63) < G3 (+2.54) Temperature = not sig. PSS = not sig UL-8 = not sig	change in HR = not sig Temperature = not sig. PSS = not sig UL-8 = not sig
Spoken ASMR (G2)		change in HR = sig. G2 (2.11) < G3 (2.54) Temperature = not sig. PSS = not sig UL-8 = not sig	change in HR = not sig Temperature = not sig. PSS = sig. G2 (33.74) > G4 (29.34) UL-8 = sig. G2 (20.23) > G4 (18.41)
Mindfulness Meditation (G3)			change in HR = not sig Temperature =not sig. PSS = not sig UL-8 = sig. G3 (19.77) > G4 (18.41)
Control (G4)			

These are our results after carrying out a One-Way ANOVA, Tuke and Paired t-test. Sig. = Tukey test pairwise comparisons showed significant differences, where $p < 0.05$). We used a One-Way ANOVA test to compare the mean temperature, loneliness and PSS of the four treatment groups. ANOVA also compares variance within the groups to between the groups to identify differences between more than two groups. If there is a significant difference between the groups, we can reject the null hypothesis that there's no significant difference between the means of the different four groups.

After having found at least two significant differences in the groups from the ANOVA test, we followed up with a post-hoc Tukey test. The Tukey test will show which of the various means are significantly different. These are highlighted in red in the Table 1 above.

Heart Rate

We used a paired t-test to compare the means of pre vs. post heart rate as they are directly related to each other. This would also show if there's a significant difference between the two scores. In this instance, the null hypothesis states there's no statistical significant change in heart rate for a particular group. For the ASMR Sound (G1), ASMR Spoken (G2) and the mindfulness meditation (G3), the t-statistic is greater than the critical value. We reject the null hypothesis that there was no statistically significant change in heart rate for those groups. $p < 0.05$ meaning that there is a less than 5% chance that the change in heart rate is due to random chance. However for the control G4(non-ASMR video), the t-statistic is less than the critical value. We accept the null hypothesis that there was no statistically significant change in heart rate for this group. $p > 0.05$ meaning there is a greater than 5% chance that the heart rate is due to random chance.

Temperature

The f-statistic was approximately 3.033 which is greater than the critical value of 3.66 which means that there is a statistically significant difference between the average temperature of at least two groups where $p < 0.05$.

Results and Analysis

Therefore, we can reject the null hypothesis that there are no significant differences in temperature between at least two groups. There post-hoc Tukey test showed a significant difference between G1 and G2 which were the sound ASMR and the spoken ASMR, where $p < 0.05$. The mean temperature of the sound ASMR group was smaller by 0.15 ˚C

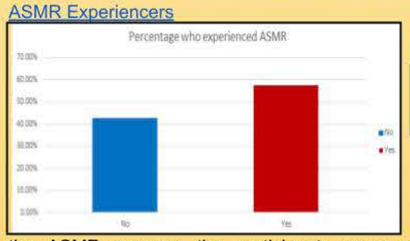
Perceived Stress Scale (PSS)

The f statistic was approximately 3.74 indicating there is a significant difference where $p < 0.05$ in at least two groups. Our p-value was 0.012. Therefore, we can reject the null hypothesis. There was a significant difference between the ASMR spoken G2 and the control group. The mean was lower in the control G4 (18.41) compared to ASMR spoken group G2 (20.2) suggesting they felt less physiological stress. The control group didn't have any significant differences.

UL-8 Loneliness Scale

The f statistic was approximately 5.76 at the significant level 0.05 indicating there is a significant difference where $p < 0.05$ in at least two groups. Our p-value was 0.0008. Therefore, we can reject the null hypothesis that there were no significant differences between at least two groups. The Tukey test showed for the UL-8 Loneliness Scale, there are three significant differences in three pairs. There was a significant difference between the sound only ASMR (G1) and ASMR spoken (G2). The mean loneliness score is higher in the ASMR spoken group. Another significant difference can be seen between the ASMR spoken and the control G4 (non-ASMR video) and the mindfulness video (G3). In both instances, the mean of the negative control was lower meaning that group had a lower average loneliness score.

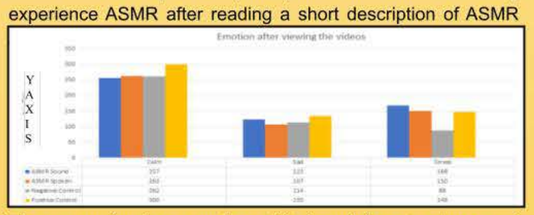
ASMR Experiencers



89/155 (57%)= Yes

66/155 (43)= No

At the end of the ASMR surveys, the participants were asked if they experience ASMR after reading a short description of ASMR



These are the key emotions felt in relation to stress and loneliness that we tested. Our survey showed 35% of participants enjoyed the ASMR videos, 28% did not. 37% were neutral about the videos. These results may explain the unexpected outcome.

Conclusion & Recommendations

Our research demonstrates that ASMR does in fact lead to a decrease in average heart rate compared to the control G4 as the non-ASMR control group did not see a significant difference in mean heart rate before and after watching the video ($p = 0.42$).There was a significant difference between the ASMR sound and spoken groups ($p = 0.03$).The fact that there is no significant difference in temperature between ASMR and the control groups suggests that the difference was not due to ASMR. According to the PSS, there was a significant difference between the ASMR group and the control group ($p = 0.07$). To our surprise, the mean of the control group (G3 = 30.7, G4 = 29.34) actually scored lower on the perceived stress scale compared to the spoken ASMR group (33.74) meaning they were more stressed. The mean of the spoken ASMR group (20.23) scored higher on the loneliness scale compared to the control and mindfulness group groups(G3 = 19.77, G4 = 18.41) ($p = 0.002$). This means the ASMR spoken group felt more lonely after the experiment than any of the other groups. If we were to get the chance to do this experiment again, conducting this experiment on only ASMR responsive individuals, would eliminate the variable of their being non-responsive individuals. 43% of participants reported not experiencing ASMR. When asked in our survey how this felt after watching the (ASMR) video, more people said they felt stressed compared to the other groups. 28% of people also said they didn't enjoy the ASMR video. This could be the reason that the ASMR groups had the highest perceived stress scale and loneliness scale scores.

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