Author: Darwin Khay

Do ASMR videos help with Sleep and Mental Health?

Abstract:

This project explores the idea of ASMR videos and how they affect the mental health of viewers who consumed these videos. To explore this idea, a dataset with responses from a survey about experiences with ASMR and the mental health history of participants of this survey was used. After wrangling the dataset and summarizing the key variables, the participants were separated into three groups: little to no depression, mild depression, and highest level of depression. The average mood of the participants after watching ASMR videos is consistently the highest for the group of lowest levels of depression, and is lowest for the group of highest levels of depression. The majority of all groups watch ASMR videos to relieve negative mood. Also, almost all of each group watches to deal with stress and help them sleep. After visualizing the data, in particular creating the histograms for the mood while watching and after watching ASMR videos, the shape is more left skewed, meaning more people have better moods in these instances. For the facet-wrapped bar graph of the BDI group, HelpWithSleep, and EffectSleep variables, it shows that participants who watch ASMR videos for the purpose of helping with sleep are more likely to agree that the videos do indeed affect their sleep.For the multilinear regression model, the response variable was the mood after watching ASMR videos and the predictor variables were the mood while watching ASMR videos, the daily mood, and the participants' BDI depression index. Through this model, it was found that despite a person's mood in general or while watching ASMR videos, they still end up having a better mood after watching, though the increase varies depending on how depressed they are to begin with. With the logistic regression model, it was used to predict the EffectSleep variable by using the BDI_TOTAL, BAI_TOTAL, Mood_Before_watch, and Mood_After_watch variables. It was found that the more depressed a person is, while having low moods, the better the effect ASMR videos have on helping the particular person sleep. One sample inference of proportions was conducted in which the population is all people who watch ASMR videos and the population parameter is the proportion of people whose sleep was positively affected due to ASMR videos. It was found that the true percentage of people who watch ASMR videos whose sleep is affected by these videos is between 54.8% and 63.8%. Two sample inference on paired populations was also conducted, where the population parameter is the average mood of participants after watching ASMR videos and in general, and it was concluded that the average daily mood of people who watch ASMR videos is between 23.4 and 20.6 lower than the mean mood after watching.

Introduction:

Taking care of mental health and getting adequate sleep are very crucial in life, but sometimes we forget to fully realize the importance of such and take initiative in doing so. There are many ways that mental health and sleep can affect a person's life, whether good or bad, depending on how a person decides to act on taking care of their mental health. In recent years, and more so from personal experiences and from the exploration of the video sharing platform, YouTube, ASMR videos have become more popular. ASMR stands for Autonomous Sensory Meridian Response and it is defined as a tingling feeling in the back of the head as a response to visual and audio stimuli and is generally associated with feelings of relaxation and ease.[1] ASMR videos may entail whispering or soft speaking and very discrete yet quiet sounds that serve the purpose of helping people achieve the ASMR experience. Based on the anecdotes of many viewers of these ASMR videos in the comments section of YouTube, many have said that these videos have helped them sleep and even eased their depression or anxiety. This seems like ASMR videos could be a potential facilitator in helping with improving mental health and sleep. So this report will explore that idea and see if ASMR videos do improve people's mental health and sleep.

The dataset that is used is a collection of responses from a survey that was conducted on 475 people. The responses of the survey included information such as their experiences with any chronic illnesses or other health problems, and all sorts of experiences with ASMR. The dataset first includes categorical variables for basic and demographic information such as participant number, age, gender, and

location. Another part of the dataset includes more categorical variable data on the participants' experiences and history with any underlying health problems: the Beck Depression Inventory (BDI) group they belong to, their BDI and BAI total score, and any chronic illnesses they might have and what medications they take for them. The rest of the dataset, the majority of it, includes data on the participants' experiences with ASMR with a mixture of categorical and numerical variables. This includes data on how often and when the participants watch ASMR videos, how the ASMR videos make them feel when watching them, and if ASMR videos had any effects on their chronic illnesses or other health problems. In terms of the values of the data, some data includes "yes/no" answers in the form of 0's and 1's, and other values are in the form of ordinal data, such as ratings from 1-5. Other data is in the form of bigger scale ratings from 1-100, and ambiguous answers to other specific questions from the questionnaire. For some of the data that pertains to putting the participants in specific groups of data, a range of numbers were used.

First this paper will explore this dataset by wrangling and summarizing the key variables. The second part of this report will include visualizations will be made for those key variables, and the third part will include regression models to predict specifically chosen response variables when given other predictor variables. The last part of this report will use one sample inference to explore the population of this dataset more and to answer the main questions. The main question that will be answered throughout this report is: do ASMR videos help those with mental health and sleeping issues? If so, to what extent do they help and does it vary among different groups of people?

Data Wrangling and Summaries:

For this dataset, the variables that were relevant included data of: the scores measuring levels of depression and anxiety, putting the participants into three groups of varying depression levels based on those scores, any chronic illnesses participants may have, participants' viewing habits with ASMR videos, and the effects of those ASMR videos on the mood, mental and emotional health of participants. Next, the column names of the variables were changed in order to provide more detail or clarity n on what the variables represent. After renaming the variables, some of the variables were converted from the numeric type to character type since those numeric vectors were categorical variables that can be represented by using character values. In general, vectors that were initially numeric that were then changed to categorical variables were for the purpose of better representing "Yes" or "No" data, to provide category names, or to change values of 0 to NA values. For the numeric variables, the mean and standard deviation were chosen because the data does not have any outliers, since there is a specific range of what the values can be for all numeric variables. All were grouped by the "BDI_group" to better answer the overall question. For the categorical variables, a frequency table was used only for the "Illness_Type" variable since it would make sense to pick out the chronic illness with the highest frequency and connect it to the idea of how chronic illnesses may affect mental and emotional health across all participants. However, it also made sense to use a two-way table with the "BDI_group" and "Illness_Type" variables to see how the chronic illnesses with the highest frequency are related to groups of varying depression. For the rest of the categorical variables, most of them pertained to how ASMR affected the participants. Only two-table summaries were used to group these with the "BDI_group" variable since the frequency data of the other categorical variables alone do not hold meaning when answering the overall question.

After data wrangling, it was found that the BDI and BAI total mean score was the highest for the group with the highest levels of depression, and lowest for the group with the lowest level of depression, with the middle being the group with mild depression. This is expected as the BDI and BAI score measure the levels of depression and should increase as the score increases. The standard deviation of the BDI and BAI score were highest for the highest depression level group, lowest for the mild depression group, and with the lowest depression group in between. This means that within the group of the highest depression levels, there is a wider range of moderate to severely depressed or anxious participants in this group. The mean mood before watching ASMR videos is lowest for the group of highest levels of depression, and highest for the group of lowest levels of depression, with the mild depression group in between. The standard deviation for this variable is higher for the group with the highest levels of depression, which is

expected since this group contains participants of more varying levels of depression compared to the two lower groups. The mood of the participants after watching ASMR videos decreases as the time after watching increases, but the mean is consistently highest for the group of lowest levels of depression, and is lowest for the group of highest levels of depression.The standard deviation for the variables pertaining to the mood of participants is highest for the group of highest levels of depression, lowest for the group with little to no depression, and the middle group is in between. This makes sense since the group with the highest levels of depression have more varying depression levels and therefore would have more varying moods. For the chronic illness variable, the most common type related to the brain are migraines. This could mean that with migraines being more common, issues with depression and anxiety become more prevalent among individuals. The majority of all groups watch ASMR videos before sleeping. In regards to the variables that categorize the participants in levels of agreement to statements representing how they feel when watching ASMR videos, all of the groups share similar traits of how they feel when watching -- most are focused on watching, focused on how they feel, and feel at ease and stable. The mildly depressed and highest levels of depression groups mostly said that ASMR videos improved their sleep quality, but not for the group of lowest levels of depression. The majority of all groups watch ASMR videos to relieve negative mood, enjoy asmr videos overall and even without the full experience of ASMR sensation, and to relax. The bulk of the lowest and highest levels of depression groups watch to deal with anxiety, but the group in the middle was split between neutral and fully agreeing to that statement. Also, almost all of the groups watch to deal with stress and help them sleep. Most of the group with the lowest levels of depression do not watch to deal with depression. On the other hand, the mildly depressed group somewhat watches ASMR videos to deal with depression, while the majority of the group with the highest level of depression watch to deal with depression.

So overall, most people do have a better mood after watching ASMR videos, and the mood decreases after not watching ASMR videos for a long time. However, the increase and decrease in mood depends on how depressed a person is. The more depressed a person is, the lower the increase in mood but the higher the decrease in mood. On the other hand, the less depressed a person is, the higher the increase in mood and the lower the decrease in mood. It was also found that the more depressed a person is, the more likely the person's sleep is affected positively compared to less depressed people. However, all of these groups watch to relieve stress and to have better sleep regardless of the outcome and how effective these videos are.

Data Visualization:

In the stacked bar graph of the worrisome level of participants while watching ASMR videos (see Appendix B), the conditional percentages across all groups seem to be almost constant. The BDI group variable is not dependent on the FlowNotWorried variable. The BDI group category of "moderate or severe depression" should generally experience more worrisome individuals. However, the FlowNotWorried variable is the measure of worry while watching ASMR videos and essentially relaxing. So regardless of the level of depression an individual has, how worried they feel while watching ASMR videos will generally be independent of the level of depression. Also, in the stacked bar graph that shows the control level of participants while watching ASMR (see Appendix A), the conditional percentages are relatively the same while the "moderate or severe depression" group has a slightly lower percentage, which is expected and related to the reasonings for the first stacked bar graph.

For the histogram of the mood of participants before watching ASMR videos (see Appendix C), the distribution seems very slightly left skewed with the mode of 50. The median seems to be around 50 or a very little above it. The outliers seem to be on the left end, with very low values of mood, like 0. The range of this histogram is from 0 to 100. The histogram is also very much like the histogram of the general mood of participants (see Appendix F). Overall, this shows that the mood of participants before watching ASMR videos is very slightly above average. For the histogram of the mood while watching ASMR videos (see Appendix D), the shape is more left skewed, so there are more outliers on the left with values of around 30. The median is somewhere around 75 and the mode is a little above 80. The range is from 30 to 100. As for the histogram of the "after" mood (see Appendix E), the distribution is more left

skewed with an outlier of 0. The range is from 0 to 100, and it seems to be bimodal, with modes of 70 and 93. The median is somewhere around 65. Overall, there seems to be an increase in mood based on the progression of the histograms.

Likewise, for the side-by-side boxplots of the "before"(see Appendix G) /"general" (see Appendix J), "during" (see Appendix H), and "after" mood (see Appendix I) grouped by the BDI groups , there is an increase in mood. The median for the BDI group of "little to no depression" is consistently higher than the other two groups, with the median of the "mild depression" group in the middle and the "moderate or severe depression" group with the lowest. The medians are the greatest for the "while" mood boxplots for all groups. The group of "little to no depression" has outliers on both ends of the boxplot for the "before"/"general" mood, and has outliers on the lower end of around 26 and 38 for the "while" and "after" mood boxplots. The "mild depression" and "moderate or severe depression" groups have outliers in the "after" mood box plots as well, on the lower end. However, there is one outlier in the "general" boxplot for the "mild depression" group. So in general, the groups of "mild depression" and "moderate or severe depression" tend to have less spread compared to the group of "little to no depression".

For the scatterplots of the BDI total score and the moods of the participants before (see Appendix K)/in general (see Appendix N), while, and after watching asmr videos, there seems to be a negative relationship between the BDI total score and mood. The higher the BDI total score, the lower the mood of a participant. However, the correlation between the two does not seem to be strong. Therefore, there are definitely outliers in these scatterplots. For example, in the scatterplot of the mood of participants before watching ASMR videos, there is a point with a BDI total score of close to 0, meaning this participant is almost not depressed at all, but has a "before" mood of just below 12.5 which is really low. Overall, however, there seems to be an increase in mood before/in general, while (see Appendix L), and after (see Appendix M) watching ASMR videos as expected.

For the side-by-side boxplots of the BDI group, BDI total score and the category of relief of negative mood (see Appendix O), the median for the "little to no depression" group is the lowest in terms of the BDI total score and increases across the "relieve negative mood" categories. This means that the more likely participants watch ASMR videos to relieve negative mood, the more they have a higher BDI score, which makes sense because their levels of depression are higher. The median of the BDI score is higher for the "mild depression" group and highest for hte "moderate or severe depression" group, though the median is not increasing for these two groups across the "relieve negative mood" categories. The median is more consistent for the "mild depression" group and fluctuates for the "moderate or severe depression" group. The same observations can be made for the "watch to deal with anxiety/stress/depression" side-by-side boxplots as well (see Appendices P, Q, and R). This means that for the groups with higher levels of depression, their reasonings in watching ASMR videos vary and do not really correlate with their depression BDI score.

Lastly, the facet-wrapped bar graph of the BDI group , HelpWithSleep, and EffectSleep variables (see Appendix S) show that participants who watch ASMR videos for the purpose of aiding with sleep are more likely to agree that the videos do indeed affect their sleep. However, across the depression group, it varies, with the participants who are the least depressed are less likely to agree that the videos helped them sleep in comparison to the other two depression groups. Overall, since the conditional percentages vary across the three depression groups and within the categories of the "HelpMeSleep" and "EffectSleep" variables, the three variables are dependent on each other.

Regression and Analysis:

The multilinear regression model that was built was used to predict the Mood_After_watch response variable based on the predictor variables BDI_TOTAL, Mood_During_Watch and Mood_Daily. The model can be written as: Mood_After_watch = 10.73 + 0.12BDI_TOTAL + 0.63Mood_During_Watch + 0.26Mood_Daily. Thus, the multilinear regression model had a y-intercept of 10.73, which would mean that when all of the predictor values are all 0, the Mood_After_watch value would be 10.73. This could make sense, since a person can have a slightly better mood after watching

ASMR videos given that the person has no depression, but had the worst mood on a particular day while watching ASMR videos and having the worst mood in general at that point in time. Assuming all other predictors are fixed except for the BDI_TOTAL variable, for every 1 point increase in the BDI_TOTAL, the Mood_After_watch variable increases by 0.12. For the slope of the Mood_During_Watch variable, and assuming all other predictors variables are fixed, a 1 point increase in the Mood_During_Watch variable would cause a 0.63 increase in the Mood_After_watch variable. Finally, for the slope of the Mood_Daily variable, while assuming all other predictors are fixed, a 1 point increase in the Mood_Daily variable would mean there is a 0.26 increase in the Mood_After_watch variable. The multiple R-squared value indicates that the model explains 57.53% of the variability/spread in Mood_After_watch response variable using BDI_TOTAL, Mood_During_Watch and Mood_Daily as the predictors. The adjusted R-squared value indicates that good predictions are made 57.26% of the time. With the multilinear regression model, the Mood_After_watch variable was predicted three times. Each of the three observations had differing values. The first observation had BDI_TOTAL = 10, Mood_During_Watch = 70, and Mood_Daily = 65, and the outcome of the Mood_After_watch variable ended up being 72.99. The second observation had BDI_TOTAL = 44, Mood_During_Watch = 31, Mood_Daily = 26, and then Mood_After_watch = 42.29. The third observation had BDI_TOTAL = 23, Mood_During_Watch = 63, Mood_Daily = 56 and Mood_After_watch = 67.78. This shows that given a low BDI_TOTAL, meaning a low depression level, and somewhat high values of mood while watching ASMR videos and in general indicate that this person would end up having a higher mood after watching ASMR videos as seen with the first observation. The third observation shows that an average person with a medium low score of BDI_TOTAL, so an average depressed person, with moods slightly above average while watching ASMR videos and in general would generally have a slightly above average mood after watching ASMR videos. The second observation indicates that a person with a very high BDI_TOTAL, so a very depressed person, with very low moods (below 50) while watching ASMR videos and in general would generally have low moods after watching, but is still slightly higher than their daily moods and moods before watching. This means that despite a person's mood in general or while watching ASMR videos, they still end up having a better mood. This could mean that the effects of ASMR videos have a positive impact on a person's mood and therefore a person would feel more relaxed or relieved of stress and maybe even help with their depression or anxiety.

The logistic regression model was used to predict the EffectSleep variable by using the BDI_TOTAL, BAI_TOTAL, Mood_Before_watch, and Mood_After_watch variables. For every 1 point increase in the BDI_TOTAL, the odds of ASMR videos helping with sleep increases by 1.06. For every 1 point increase in BAI_TOTAL, the odds of better sleep by watching ASMR videos increased by 1.04. For every 1 point increase in Mood_Before_watch, the odds of having better sleep increases by 0.98. For every 1 point increase in Mood_After_watch, the odds of having better sleep increases by 1.02. Using the model, three observations were used to predict the odds of having better sleep. The first observation has little to no depression or anxiety, and very high moods before and after watching, and yielded a 54% chance of having better sleep. The second observation is slightly more depressed and anxious and has slightly above average moods before and watching ASMR videos, and then had an 80% chance of having better sleep. The third observation was the most depressed with the lowest moods and had a 95% chance of having better sleep. It seems that the more depressed a person is, while having low moods, the better the effect ASMR videos have on helping the particular person sleep. It could mean that the ASMR videos helped with relieving stress, or any sort of depression or anxiety that would aid them in sleeping better, though this isn't really seen with a person who isn't as depressed.

Sample Inference:

The population in this dataset is all people who regularly watch ASMR videos. A one sample inference was conducted on this dataset by exploring the confidence interval of proportions. The population parameter in this case is the proportion of people whose sleep was positively affected by ASMR videos. After conducting the one sample inference, it was found that the true percentage of people who watch ASMR videos whose sleep is affected by these videos is between 54.8% and 63.8%. This

means that of all the people who watch ASMR videos as part of their routine, more than half of them do get better sleep as a result. In other words, ASMR videos do seem to have a relaxing and positive effect on viewers. However, the effects may depend on the individual since some responses to ASMR videos may differ.

In order to investigate more on how ASMR videos have a positive impact on viewers in terms of mental health, a two sample inference was also conducted with confidence intervals on the population means of paired populations. The confidence interval has to take into account the dependence of the populations since the two pieces of data are from the same sample and correspond to each other. The population parameter in this case is the mean mood of people who watch ASMR videos after they watch them and also on the daily. After the two sample inference test was conducted, it was found that the mean daily mood of people who watch ASMR videos is between 23.4 and 20.6 lower than the mean mood after watching. In other words, there is a significant difference between the daily mood of people who watch ASMR videos and their mood after watching. Since there is an increase in mood of between 23.4 and 20.6 points after watching ASMR videos, then that shows that ASMR videos are able to uplift people's moods. It can then be concluded that ASMR videos overall can have a positive impact on the mental health of viewers since ASMR videos help people sleep better and uplift their mood.

Conclusion:

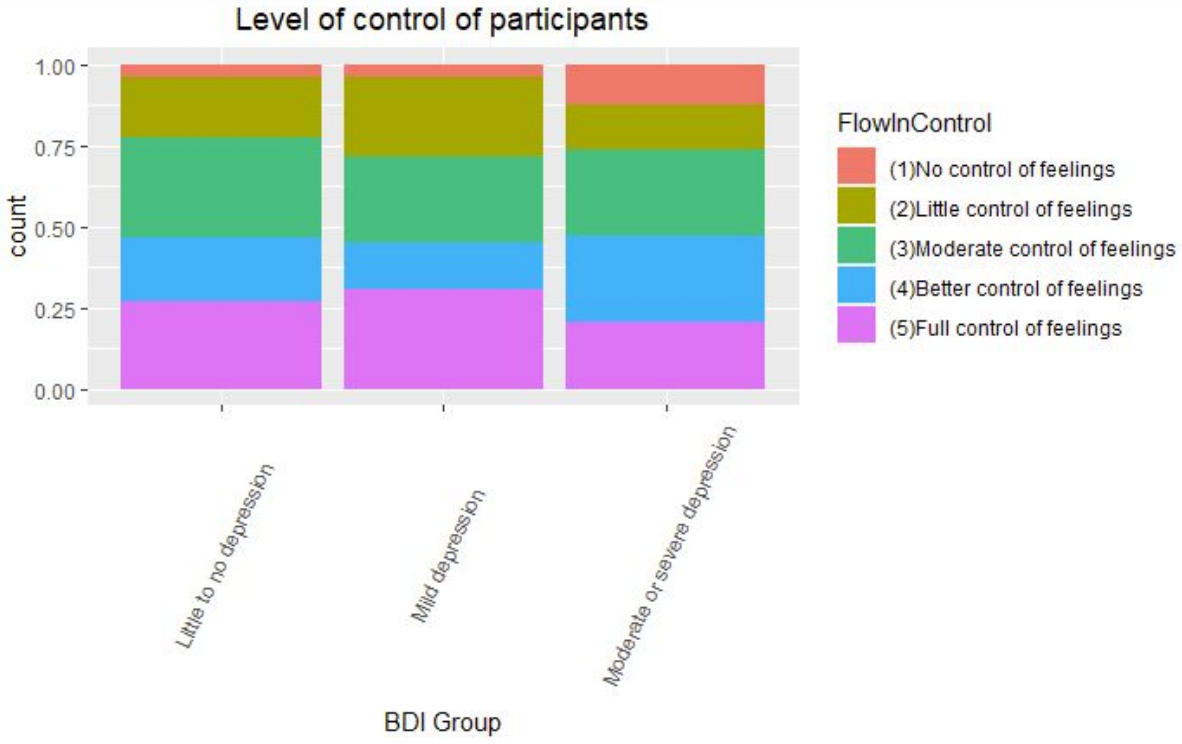
Going back to the original overarching question of this report, the statistical evidence does prove that ASMR videos do indeed help people with their mental health issues and sleeping problems. The effect also varies among individuals depending on their past mental health history, in which more depressed people are more likely to feel the benefits of ASMR videos in terms of sleeping but not so much in terms of an increase in mood. Nonetheless, there is still an increase in mood though it may not be comparable to a person who is less depressed. Therefore, ASMR videos still have a positive impact on helping those with depression and anxiety even if it may only be temporary. With that said, ASMR videos can be a temporary solution in aiding those with mental health problems and/or sleeping problems. However, the limits with this are that not everyone can enjoy ASMR. There have been other instances and personal anecdotes where people have felt the opposite when watching ASMR videos. In YouTube comments, there have been situations where people have felt the opposite of relaxation from watching these ASMR videos and even went ahead to exclaim that these videos are not normal. This report does not take into account those people because the dataset used consists of responses from people who generally have good experiences with ASMR videos. In other words, the population was only selective towards those who have the mindfulness and willingness to watch ASMR videos in contrast to those who do not. Despite the fact that not everyone enjoys these ASMR videos, they are the minority of the population and so should not be considered in this report. Overall, it's important to understand the importance of taking care of one's mental health and sleep as they truly do affect us in many ways. So in a stressful world, it's fortunate that there exists a facilitator in helping people achieve their goals and ambitions in bettering themselves in terms of mental health and sleep, since there is enough statistical evidence that does show that this facilitator, ASMR videos, can truly assist those who are willing to take initiative.

References

1. Barratt EL, Davis NJ. Autonomous Sensory Meridian Response (ASMR): a flow-like mental state. PeerJ. 2015 Mar 26;3:e851. doi: 10.7717/peerj.851. PMID: 25834771; PMCID: PMC4380153.

Appendices

Appendix A:



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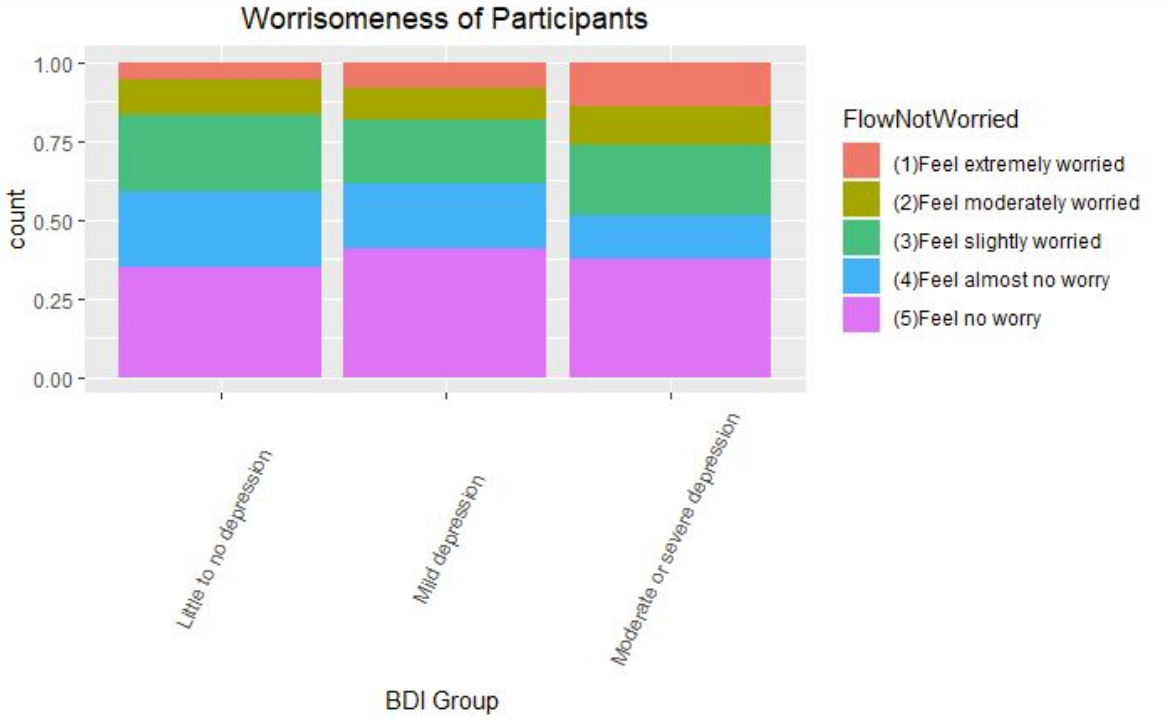

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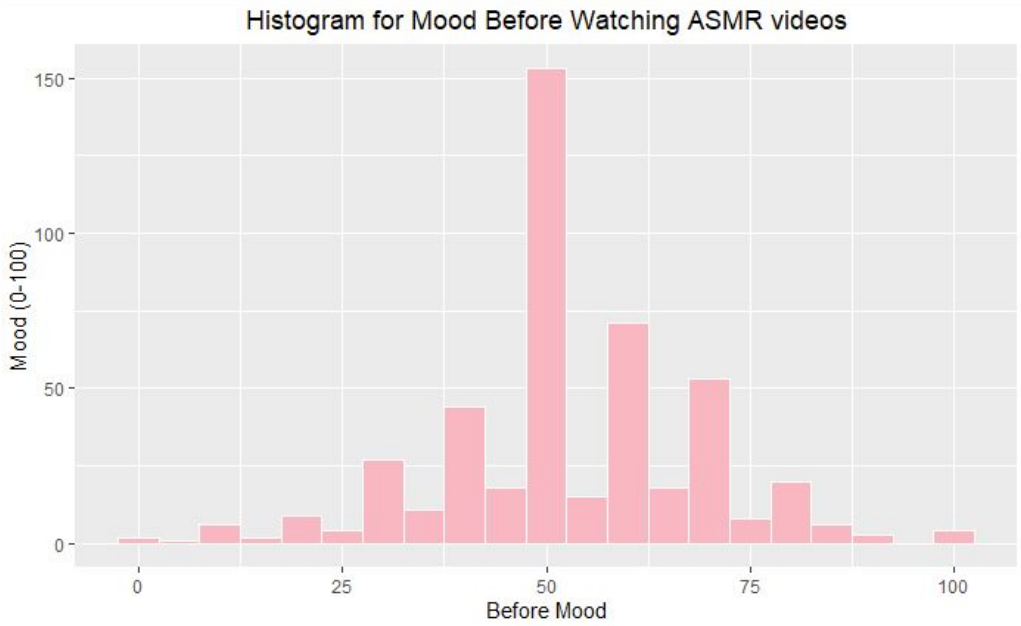

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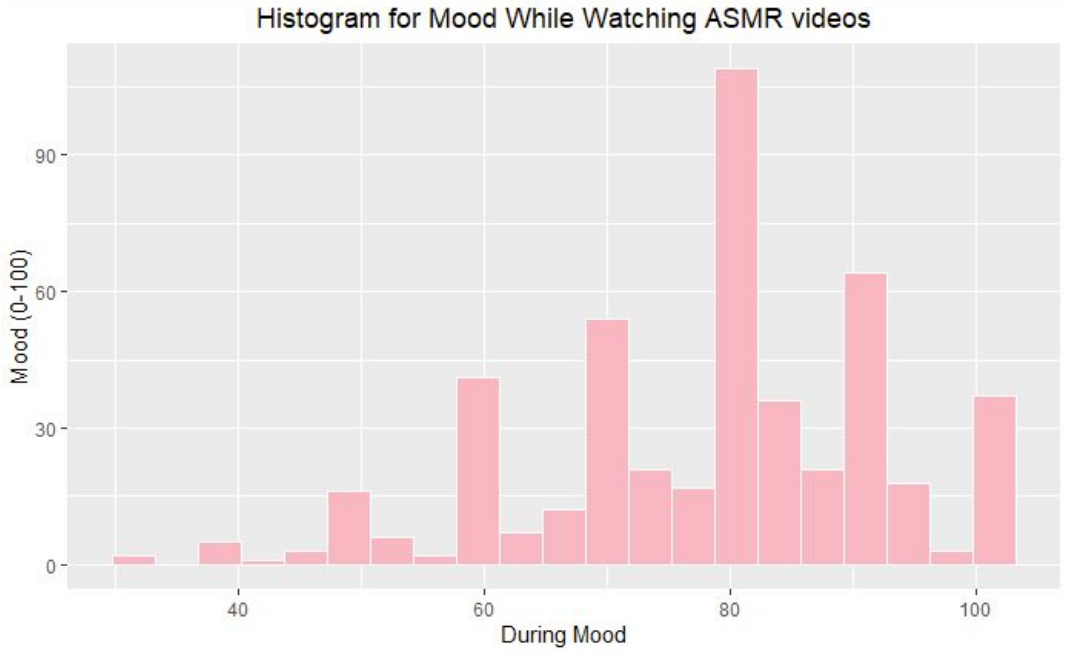

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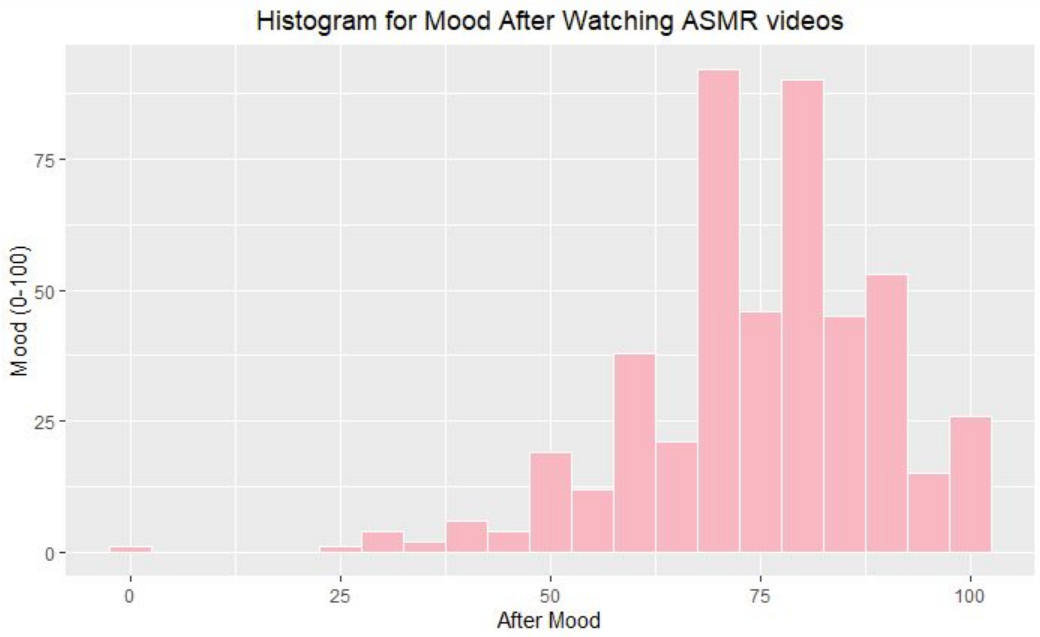

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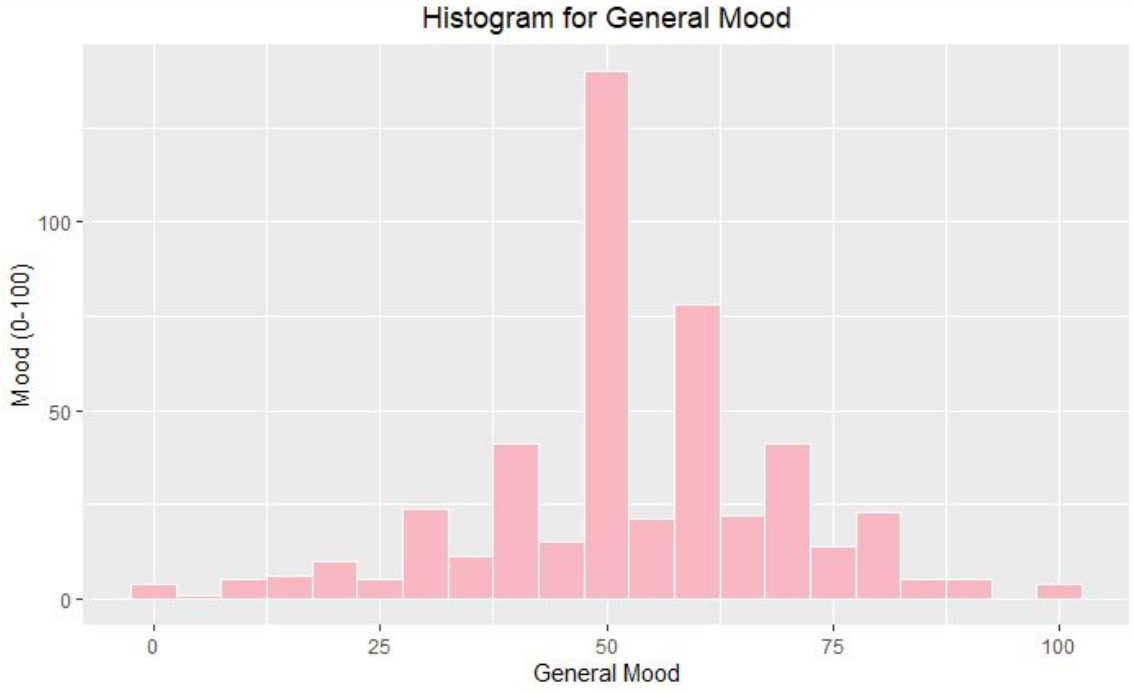

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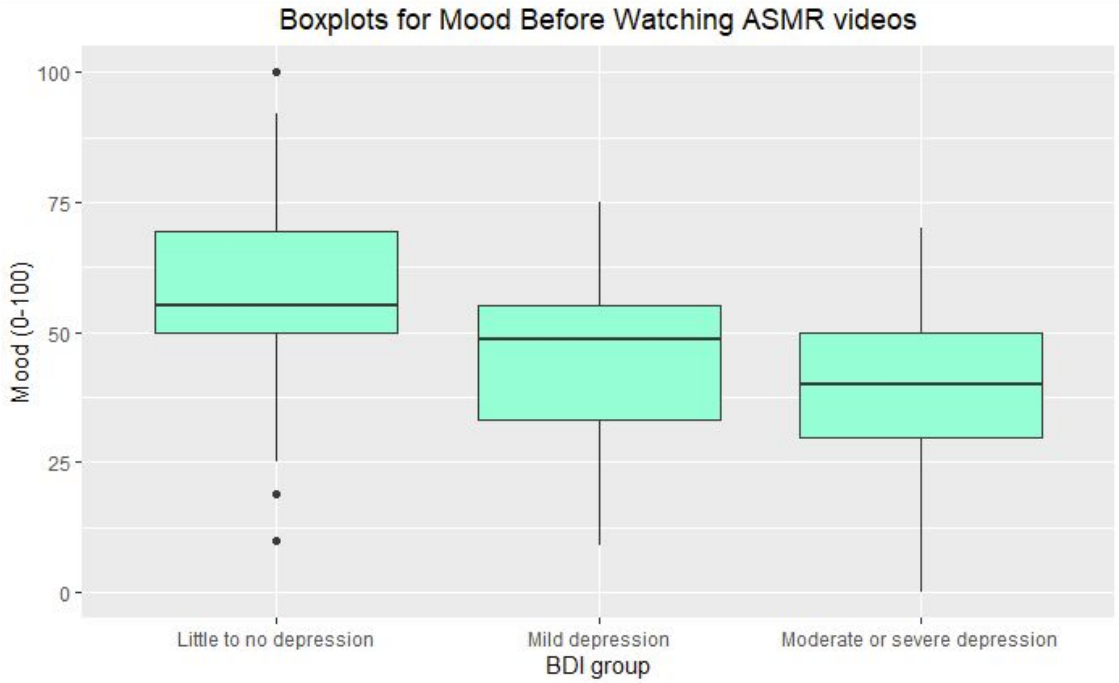

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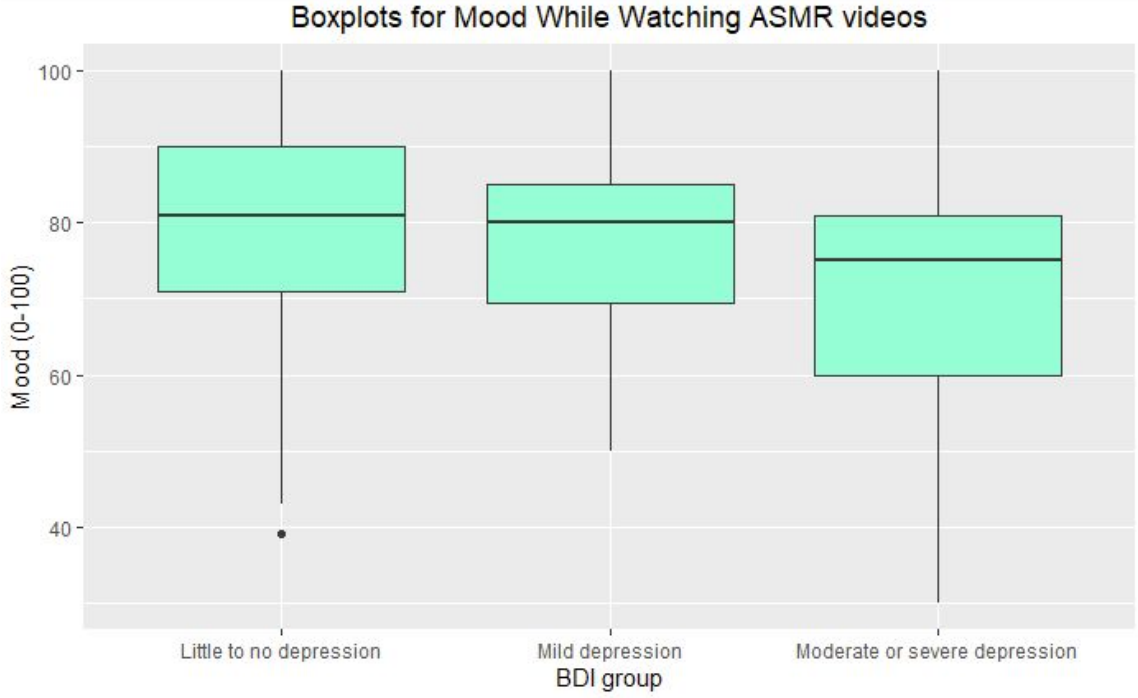

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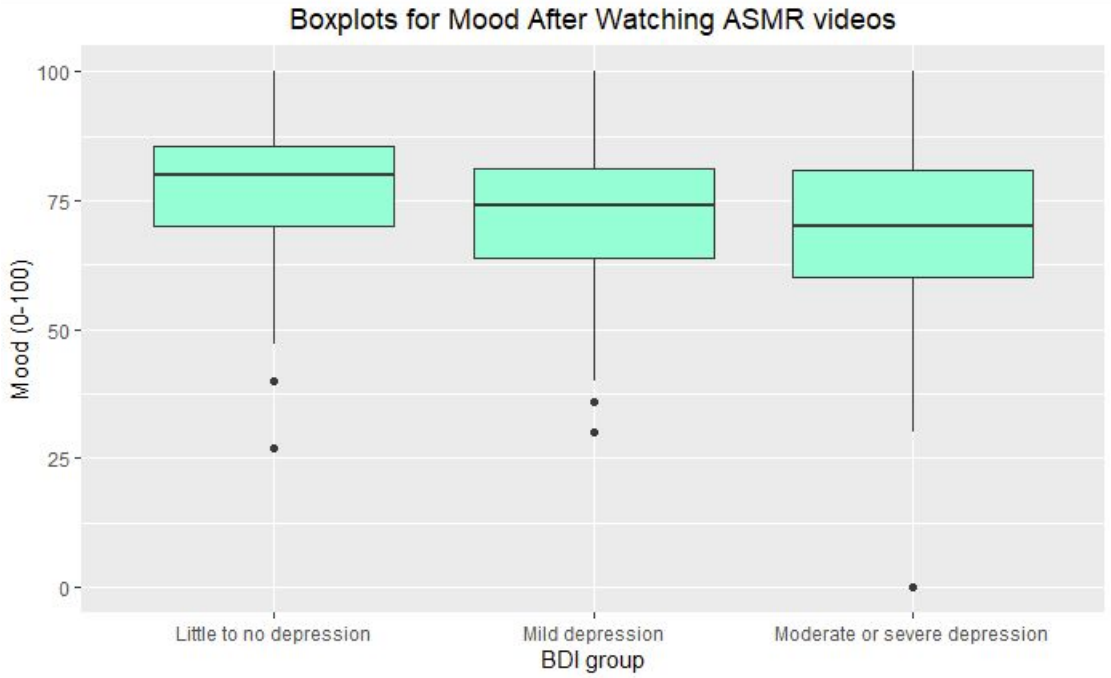

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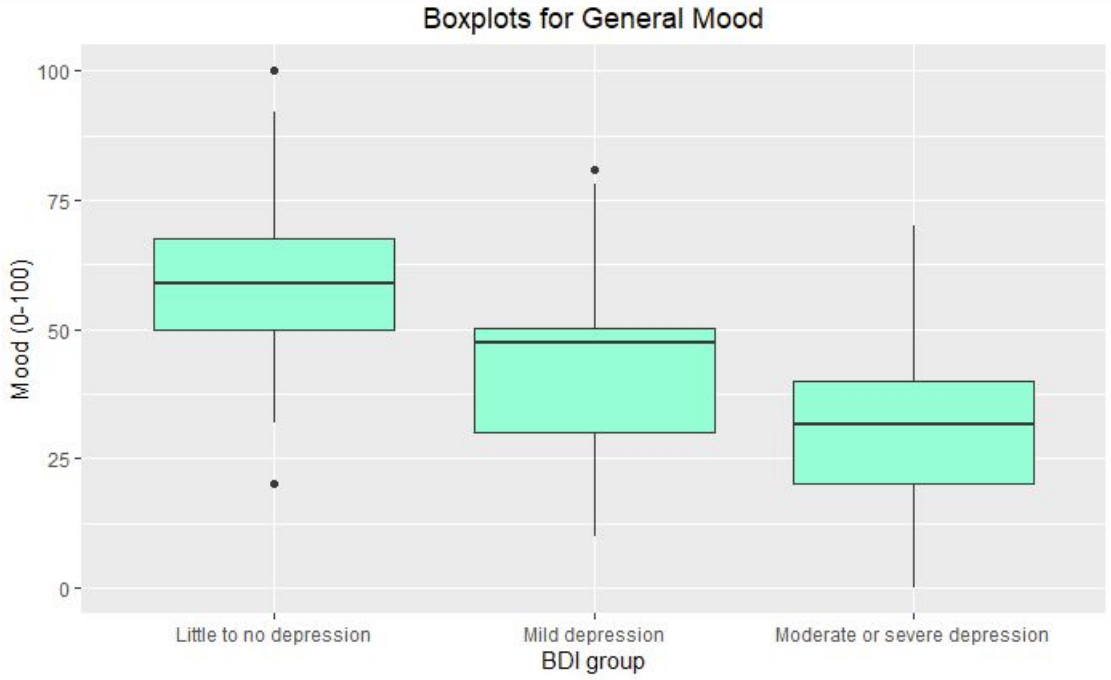

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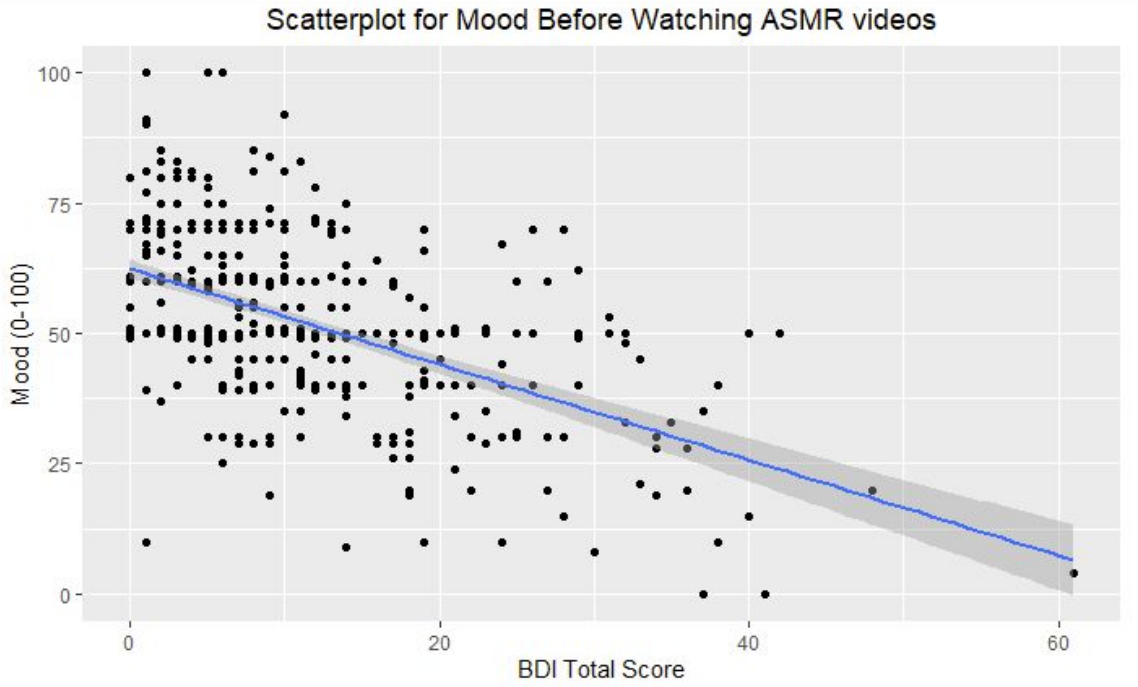

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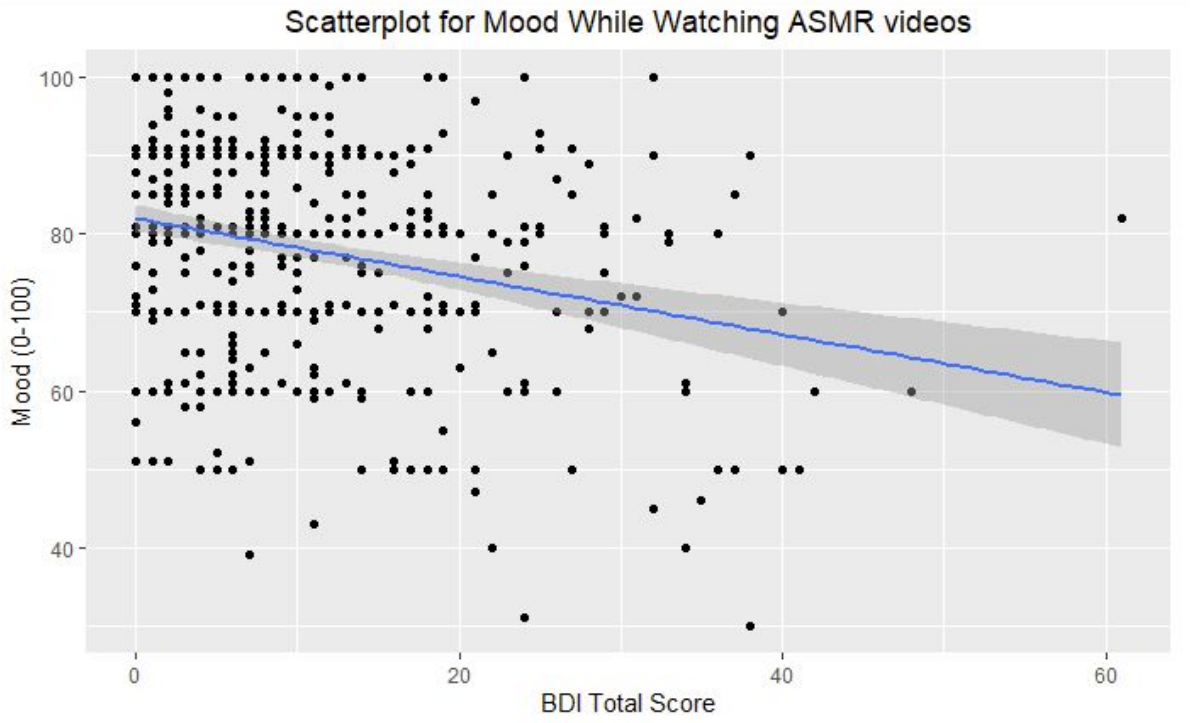

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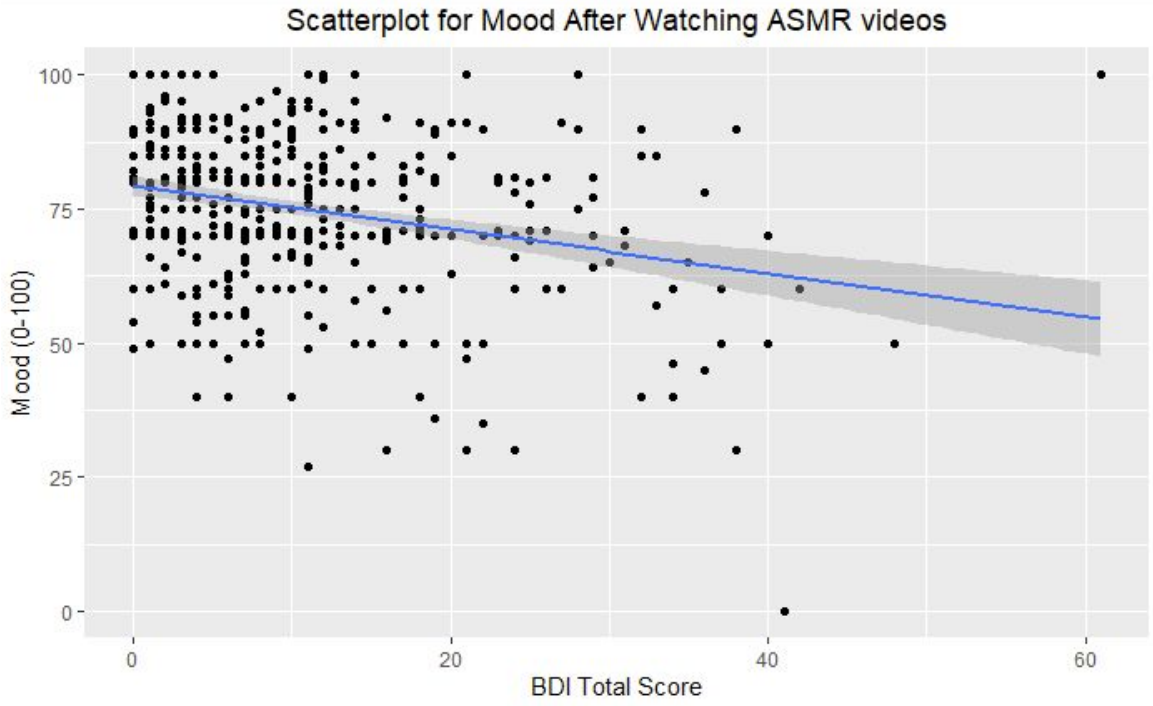

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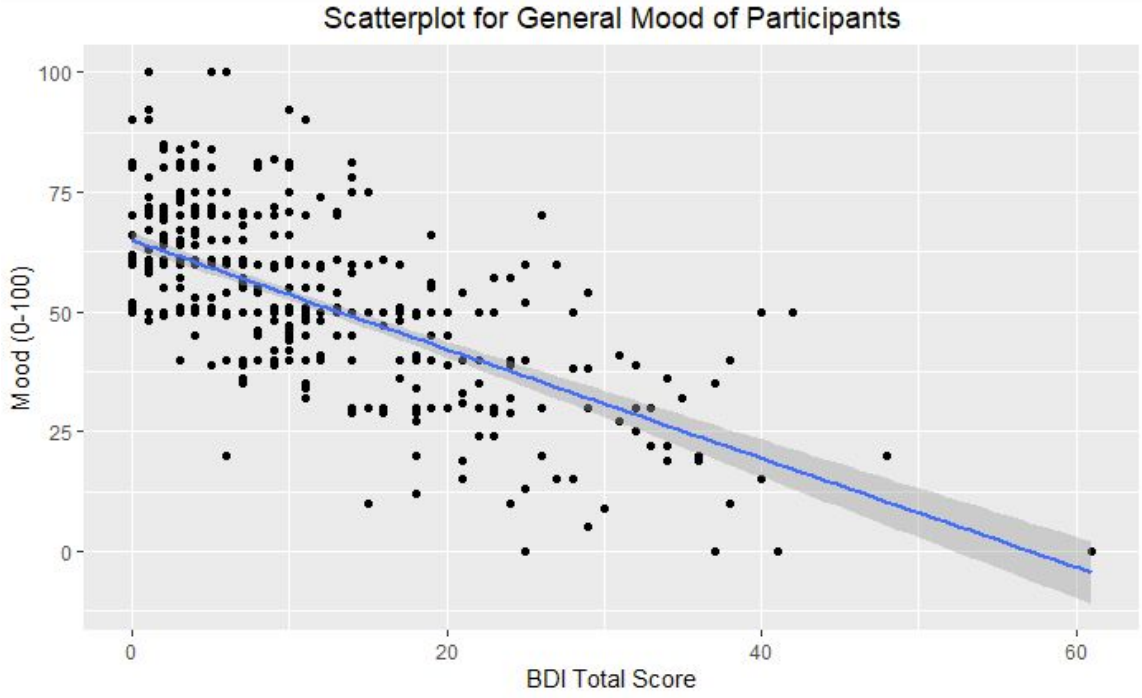
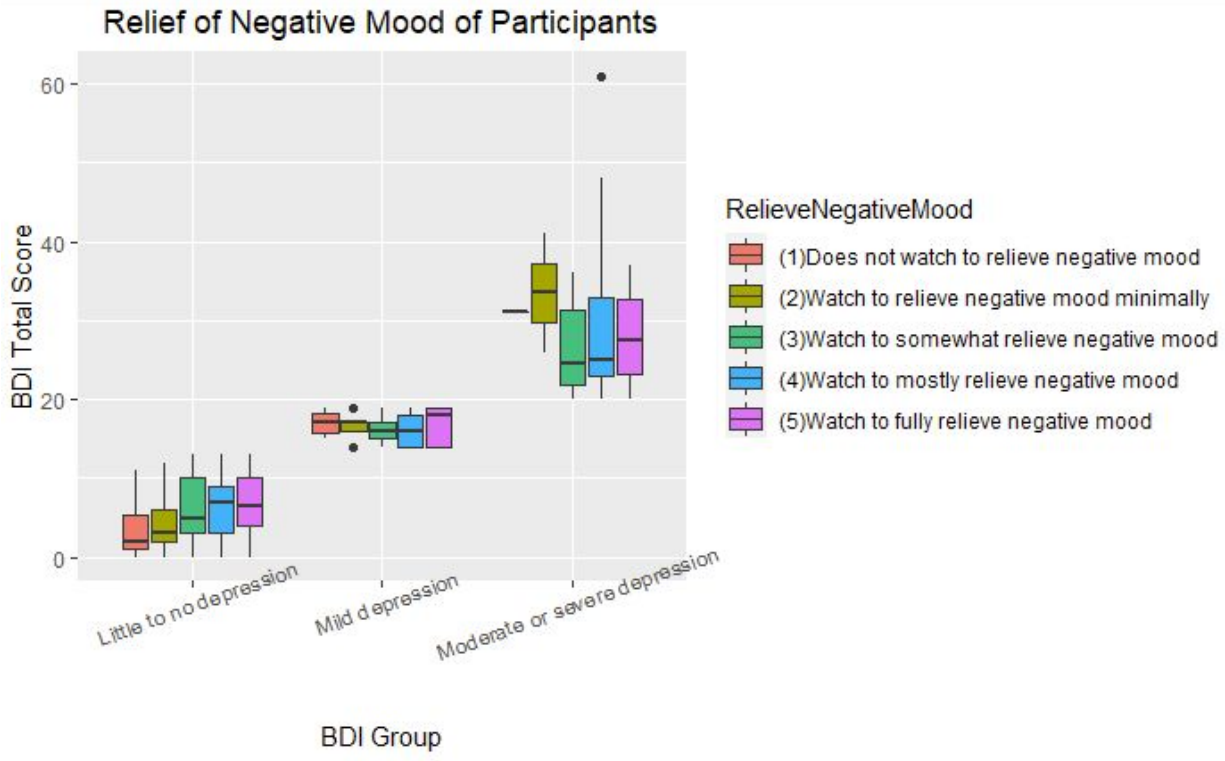
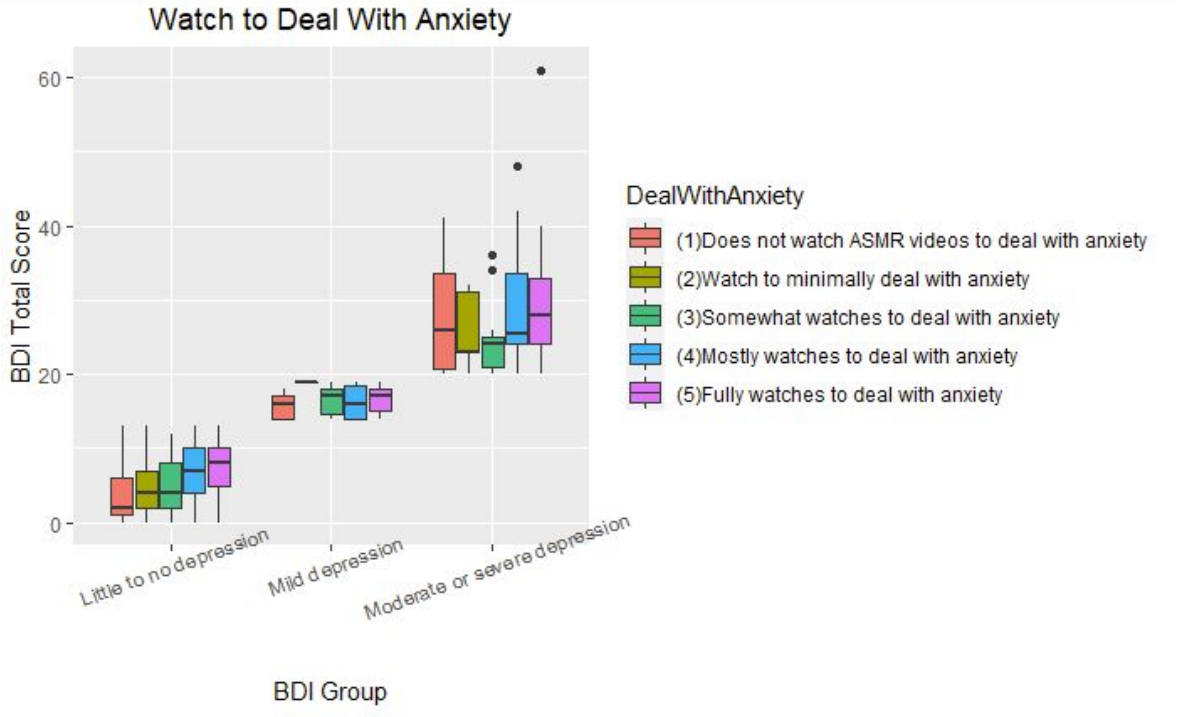


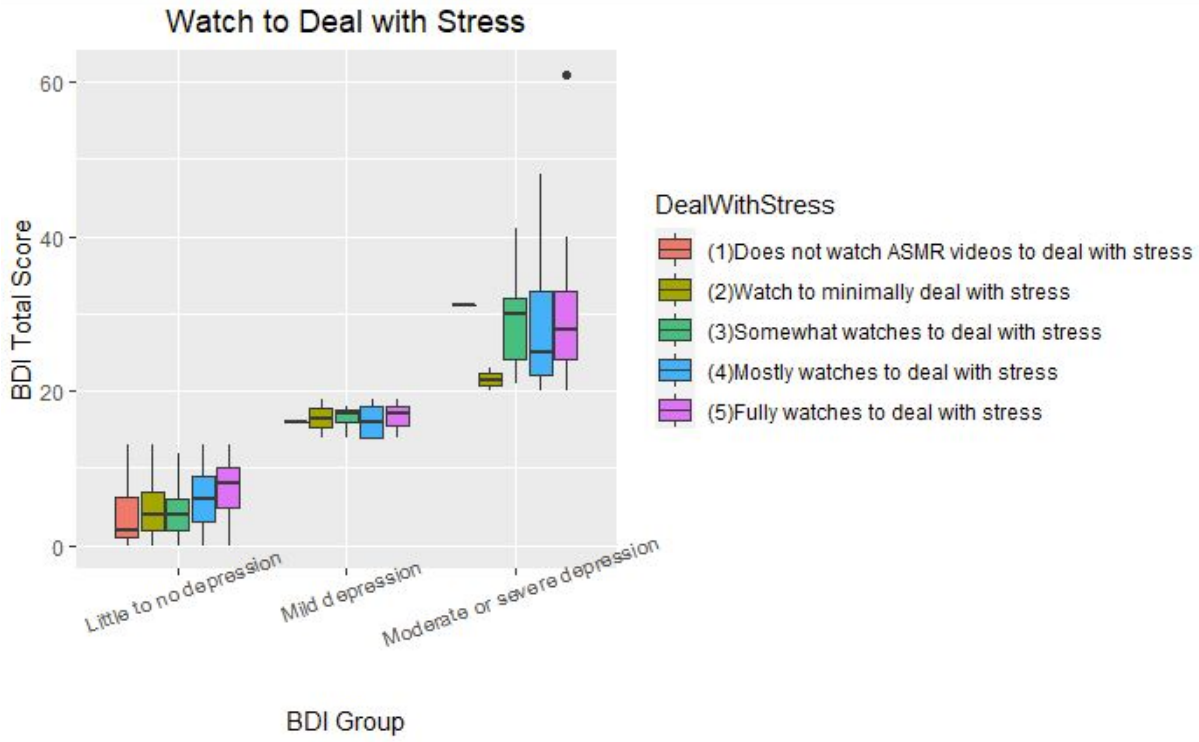
Appendix O:



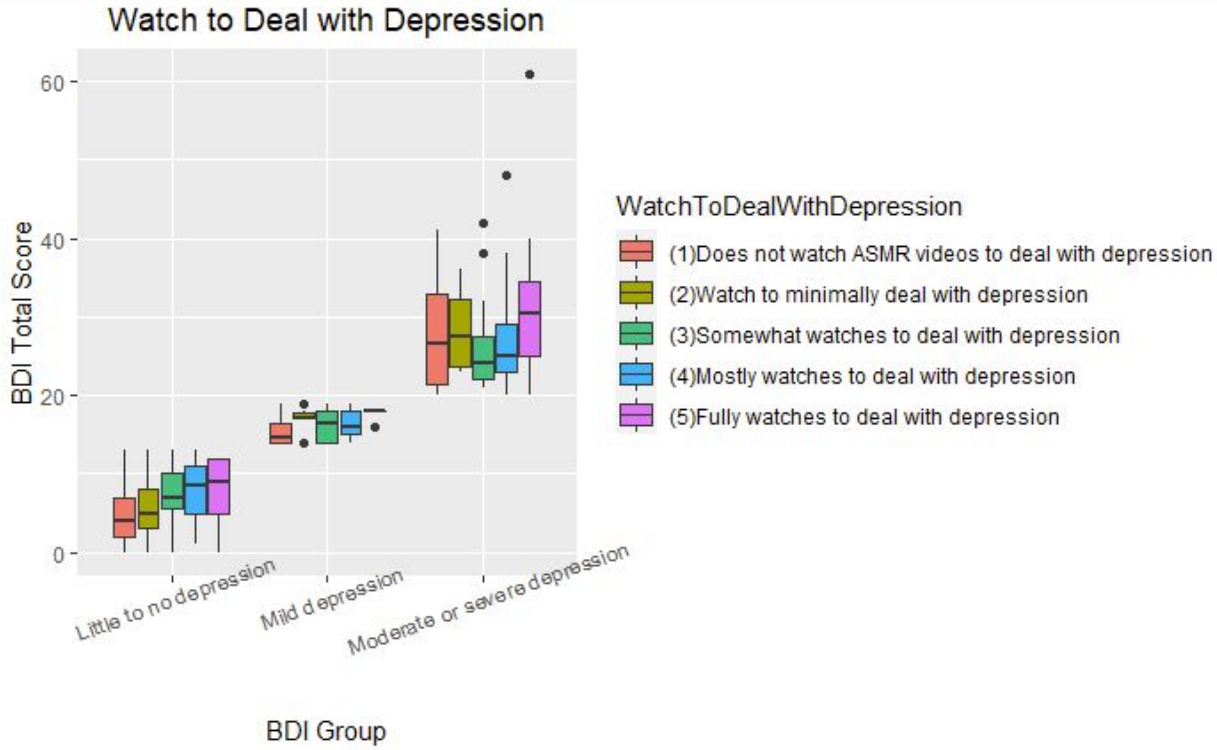
Appendix P:



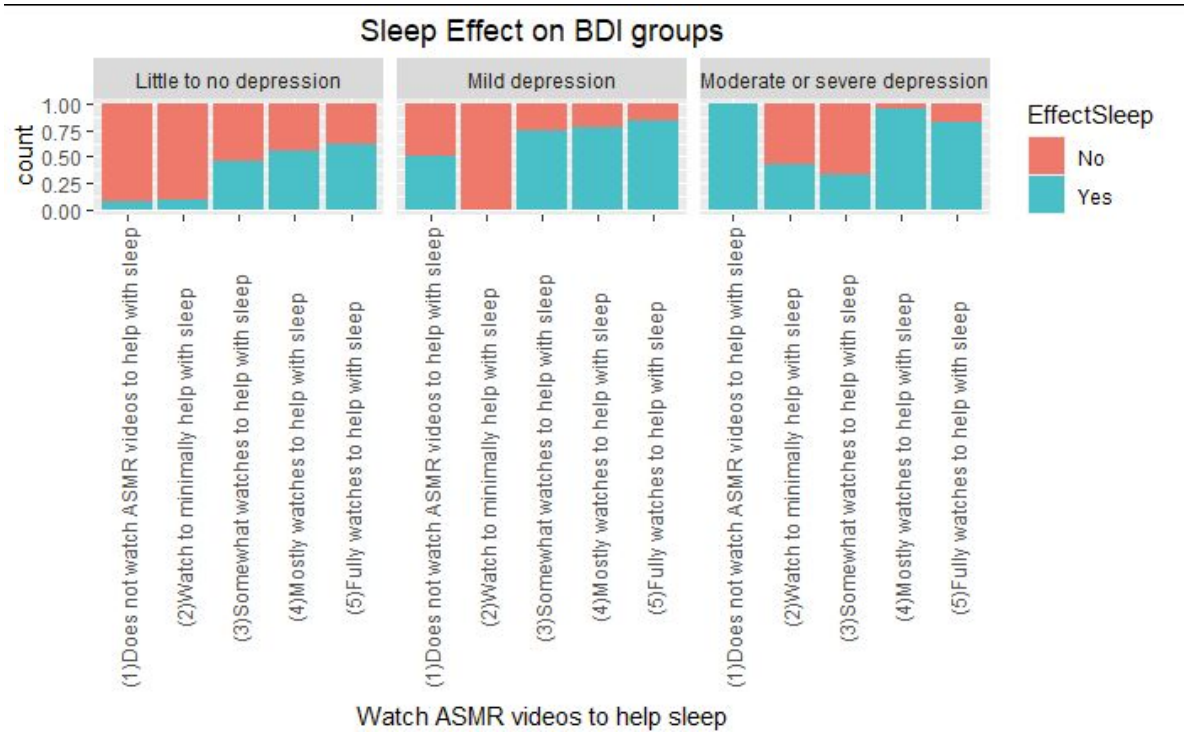
Appendix Q:



Appendix R:



Appendix S:


Sleep Effect on BDI groups
Little to no depression
Mild depression
Moderate or severe depression
count
1.00
0.75
0.50
0.25
0.00
EffectSleep
No
Yes
(1)Does not watch ASMR videos to help with sleep
(2)Watch to minimally help with sleep
(3)Somewhat watches to help with sleep
(4)Mostly watches to help with sleep
(5)Fully watches to help with sleep
Watch ASMR videos to help sleep