**Essay 2: Exploring the Effect of Meditation on Blood Pressure**

*By Adam Yang*

Having high blood pressure is the leading cause of heart disease and stroke which are the leading causes of death in the United States. According to the Centers for Disease Control and Prevention, 1 in 3 people in the United States have high blood pressure (cite). The ideal ways of reducing blood pressure are to improve your eating habits and increase the amount of exercise you get. However, these are very difficult changes for a person to self-motivate themselves make. On the other hand, taking 10 to 30 minutes out of your day to meditate can reduce stress, be relaxing and enjoyable, and therefore, may not be difficult for people to accomplish. Because of this, I would like to explore whether meditating at least once a day will decrease a person’s blood pressure or keep your blood pressure from rising.

There have been various experiments run to investigate the effects of meditation on blood pressure and the results vary. The most recent result revealed no significant difference in blood pressure due to a form of meditation (cite). It would be interesting to see what kind of results we can achieve from our experiment. I believe finding the subjects for the experiment can be a bit difficult. My initial thought is to run the experiment in person so that there is some oversight over the subjects. Doing the program in a retirement home where you can randomly select subjects to participate in a mandatory meditation exercise as the treatment group. That way you can make sure that the subjects are carrying out the dosage of the treatment as well as making sure the blood pressure readings are done accurately. However, for the purpose of this class, it might be much easier to do the experiment online and just trust the participants to perform the meditation as instructed. Doing the experiment online actually does have one advantage in its favor. The advantage is that we can avoid instances of interference. If the experiment was done in a retirement home, and half of the seniors are randomly selected to take part in the meditation seminar, word might get around and might cause the subjects in the control group to demand treatment as well. If word gets out that meditation might reduce blood pressure and improve overall health, then the control group might perform meditation sessions on their own and compromise the control group. I also believe that forced blocking should be implemented for men and women as well as ethnic background. According to webmd.com, African American males might be genetically more inclined towards high blood pressure than other groups (cite). Though I don’t know if this is necessarily true, since our sample size cannot be too big, it would be beneficial to use blocking to make sure the control and treatment groups have a similar number of subjects from each gender and ethnic group.

The ideal set up of this experiment would be to focus a large group of subjects that already have high blood pressure to begin with. The control group would not perform any form of meditation while the treatment group would be randomly selected with the implementation of blocking by gender and ethnicity. The blood pressure of both the treatment and control group subjects would be measured before the first meditation session begins. The treatment group would be guided through a 30-minute meditation exercise once every day. If enough time and people are provided, different types of mediation can be experimented with, such as Tai Chi or simply lying on your back and clearing your mind. Ideally the experiment would go on for at least a year and the blood pressure for the treatment and control groups would be measured again. However, based on realistic expectations for this class, it is likely that the subjects would be much harder to obtain, and the time period is also much shorter. We also wouldn’t able to collect a group of people with high blood pressure and guide them through the 30-minute meditation exercise. Given these constraints, it is possible to look for 100 willing participants to carry out the experiment. Random assignment and blocking can still be implemented, and the experiment might be conducted online. The control group participants will simply be asked to give their blood pressure at the beginning of the experiment and then again at the end of the experiment. The treatment group however, would be asked to download the Headspace app and perform at least one of the guided meditations exercises each day. The time constraints given in this class might mean that the meditations can only be carried out for a few weeks. The blood pressure measured at the end of the experiment will be compared to the blood pressure measured at the beginning of the experiment for both the treatment and control groups.

Randomization would be very important in the experiment because everyone has different levels of health awareness which includes different eating habits and exercise habits. It is possible that people who are more aware of taking care of their body are already performing some sort of meditation exercise in their free time. The randomization would try and keep meditation independent of factors that would lower blood pressure and make sure we are comparing apples to apples. I’m not sure if there are other ways of creating independence besides making sure that all members of the randomly selected control group do not perform any form of meditation including Tai Chi and Yoga. It might also be worth asking the participants to fill out a questionnaire about their general health awareness such as whether they actively keep track of what they eat, how much sleep they get, and how much exercise they get a week. Even though the outcome measure we care about most is how much the blood pressure changes in the treatment group compared to the control group, it might be interesting to see if other factors are changed as well. These secondary outcomes are gauged by the questionnaire. Maybe people who meditate once every day have a lower level of stress and therefore get better quality sleep. Maybe they have extra energy or just feel better in general which motivates them to eat better as well as exercise more. These can be covariates that also impact blood pressure that may be impacted by meditation.

Another way that blocking should be implemented in both control and treatment groups is by age. People of different age groups might be susceptible to different amounts of change in their blood pressure so it would be best to keep the two groups with an equal amount of each age group. Since this experiment should ideally be conducted over a long period of time, but we are restricted to a much shorter time period, this experiment can essentially be the pilot study. It is hard to imagine a large impact on blood pressure after just a few weeks of meditation. I believe the greatest risk of this experiment is that members of the treatment group do not dutifully carry out the required meditation sessions each day. It is very possible that the subjects can feel like they’re too busy to do it on certain days, or simply forget. It is also very likely that they do not take the meditation seriously and do not really make an effort to clear their mind and reduce stress. Instead they may be playing on their phone during the time and not really get the proper dosage of meditation. Also, it is likely that the treatment group knows that we are testing the effects of blood pressure on meditation because we ask them to measure their blood pressure. In this case, there might be a placebo effect from doing the meditation in the treatment group that cannot be provided to the control group since there is no meditation equivalent of a sugar pill. This can be problematic because the excludability assumption might break down.

**Works Cited:**

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Maybe try to get people to meditate twice a day to increase statistical power?

Control for covariance – should people medidate at specific times of the day?