entire study period spanned four hours. After the sessions concluded, an open forum on health-related topics was provided for the participants.

**Data Collection**

Prior to contact healing treatment, data was collected from each subject. Data collected included the subject's height, weight, age, pulse rate, diastolic and systolic blood pressure, sex, and number of years as a member of the Order. Participants were also asked to self-rate the state of pain experienced at the time of the study using a ranking scale of 0-10 on a Likert Scale; zero for no pain to 10 which was severe.[5] Immediately after the contact treatment was given, the pulse rate, diastolic and systolic blood pressures of participants were taken while still seated. After treatment, subjects were also asked to once again provide a rating of their pain using the same 0-10 Likert scale and recorded for each subject.[6] All the data provided was entered in an Excel spreadsheet.

Blood pressure readings, diastolic and systolic measurements, as well as heart rates were obtained with a battery-operated blood pressure device. With one participant, the cuff was not large enough to take baseline readings and was excluded from the study. Height was measured with a height meter set up on a wall with subjects standing barefoot with their backs to the wall. Participants were weighed clothed on a simple digital scale.

**Human Subjects, Ethical and Confidentiality Considerations**

Approval for the study was obtained prior to its inception from the administrative leaders of the Rosicrucian Order, AMORC. The objectives of the study were verbally explained to all participants with a clear understanding of their right not to participate in any or all aspects of the study. In addition, a written description of the study was provided and participants were able to include their names and contact details as an indication of informed consent. All participants gave written, informed consent prior to participation.

**Subjects' Inclusion and Exclusion Criteria**

The participants included were limited to members of the Rosicrucian Order, AMORC. The other inclusion criterion was that it was possible to manually obtain baseline and follow up blood pressure measurements. No exclusion criteria were applied on any volunteers that consented to participate in the study. Although some subjects did not have a completed data set, they were included for what data was available.

**Study Outcomes Measured**

The study measured three primary outcome variables. Those measurements compared pre-treatment data with data taken after treatment. The first variable change tracked pulse pressure (systolic pressure minus diastolic pressure). The second variable change tracked was heart rate. The third was the change in self-reported pain levels assessed by the subject. The variables employed in the study are shown in Table 1.

hypothesized decreases in the health outcomes (e.g., self-reported pain level). These decreases in the outcomes after treatment can be viewed as being not only statistically significant, but also clinically significant and desirable changes in health.

One-tailed post-hoc statistical power analyses were conducted with results reported later below. A commonly used guideline for statistical power[7] is $1 - \beta = 0.80$. The achieved power estimates given below are generally well above 0.80, so they seem satisfactory. There was a statistically significant treatment effect in heart rate decreasing on average 4.8 beats/minute, $t(34) = -3.47$, $p = 0.00072$. The post-hoc power analysis with statistical significance level $\alpha = 0.05$ gave an achieved power $1-\beta=0.96$, and for $\alpha = 0.01$ there was an achieved power $1-\beta=0.84$.

There was a statistically significant treatment effect in pulse pressure decreasing on average 8.3 mm Hg, $t(33) =-3.75$, $p = 0.00034$. (Pulse pressure is equal to Systolic Pressure minus Diastolic Pressure.) Almost all the decreases were desirable in i) keeping pulse pressure at or above 40 mm Hg and ii) keeping pulse pressure below 60 mm Hg or moving toward that level.[8] The post-*hoc* power analysis with statistical significance level $\alpha = 0.05$ gave power $1-\beta=0.98$, and for $\alpha = 0.01$ power $1-\beta=0.90$.

There was also a statistically significant treatment effect in pain level decreasing on average 2.5 points (on the 0 to 10 scale), $t(33) = -7.03$, $p < 0.000000024$. The *post-hoc* power analysis with statistical significance level $\alpha = 0.05$ gave power $1-\beta=1.00$, and for $\alpha = 0.01$ power $1-\beta=1.00$. This result is similar to the findings obtained in our earlier study.

Multiple linear regressions were performed with post heart rate, pulse pressure and self-reported pain level as the outcomes (dependent variables). Explanatory (independent variables, predictors) were age, sex, BMI, BMI squared, treatment giver, years a member of AMORC, pre-heart rate, post-heart rate (if not the outcome), pre-pulse pressure, post-pulse pressure (if not the outcome), and pre self-reported health, and post self-reported health (if not the outcome). The quadratic term BMI squared was included in order to take account of possible curvature in BMI. This approach is advisable because BMI has a mid-range that can be optimal for health (whereas both low and high BMI values can be less healthy). The sample size was $n=30$ for complete cases on the variables involved in the set of regressions for each of the three outcome variables. Only the pre-measures corresponding to the selected outcome post measure (e.g., pre self-reported pain level when the post self-reported pain level was the outcome) were, as expected, statistically significant ($p < 0.001$ throughout) and had positive coefficients. The other explanatory variables were not statistically significant even when the least significant explanatory variables were successively removed. The final regression models are reported in Table 2. The post-hoc power analyses with statistical significance level $\alpha = 0.05$ gave power $1-\beta$ much lower than 0.80 (e.g., values around 0.32) which is not surprising given the small sample size as anticipated by our original required sample size calculation. In other words, the small sample size made it hard to detect if there were any significant explanatory variables or deemed small effects in the multiple linear regressions.

Williamson, Amelia, and Barbara Hoggart. “Pain: A Review of Three Commonly Used Pain Rating Scales.” *Journal of Clinical Nursing* 14 (2005): 798–804. Accessed May 17, 2019. http://www.academia.edu/1333498/Pain_a_review_of_three_commonly_used_pain_rating_scales.

**Endnotes**

[1] George F. Buletza, *Marriage of the Mind: Processes of Insight and Integration* (San Jose, CA: Grand Lodge of the English Language Jurisdiction, AMORC, 1997).
[2] H. Mori, H. Yamamoto, M. Kuwashima, S. Saito, H. Ukai, K. Hirao, M. Yamauchi, S. Umemura, “How Does Deep Breathing Affect Office Blood Pressure and Pulse Rate?,” *Hypertension Research* 28, no. 6, (2005), 499-504, accessed August 7, 2019, http://www.ncbi.nlm.nih.gov/pubmed/16231755 and; Roberts W. Shields, Jr., “Heart Rate Variability with Deep Breathing as a Clinical Test of Cardiovagal Function,” *Cleveland Clinic Journal of Medicine* 76, (2009), Supplement 2, S37- S40, accessed August 7, 2019, https://www.ncbi.nlm.nih.gov/pubmed/19376980.
[3] Sixth Degree Research Team, Rosicrucian Order, AMORC, “Preliminary Experiments on Contact Healing, Breathing Exercises, Sounds and Their Responses,” *The Rose+Croix Journal* 10 (2014), 25-40.
[4] *Ibid*.
[5] Amelia Williamson and Barbara Hoggart,“Pain: A Review of Three Commonly Used Pain Rating Scales,” *Journal of Clinical Nursing* 14 (2005), 798–804, accessed May 17, 2019, http://www.academia.edu/1333498/Pain_a_review_of_three_commonly_used_pain_rating_scales.
[6] *Ibid*.
[7] The power of a statistical test is closely related to Type II error. Type II error occurs when the null hypothesis is accepted when the alternative hypothesis is true. For example, a common alternative hypothesis for this study is that the difference (change) in the post measurement would be a decrease. Power is 1 minus the probability (β) of a Type II error.
[8] Sheldon G. Sheps, "Pulse pressure: An indicator of heart health?," *Mayo Clinic*, accessed October 23, 2018, https://www.mayoclinic.org/diseases-conditions/high-blood-pressure/expert-answers/pulse-pressure/faq-20058189.
[9] Sixth Degree Research Team, Rosicrucian Order, AMORC, “Preliminary Experiments on Contact Healing, Breathing Exercises, Sounds and Their Responses,” *The Rose+Croix Journal*, 10 (2014), 25-40.
[10] 26 out of the 35 participants that had both pre and post measurements were in the hypertension ranges. Mayo Clinic Staff, “Blood pressure chart: What your reading means,” *Mayo Clinic*, accessed May 17, 2019. https://www.mayoclinic.org/diseases-conditions/high-blood-pressure/in-depth/blood-pressure/art-20050982.
[11] Akinlua *et al.* in a 2015 systematic review reported a crude prevalence rate of hypertension in Nigerian adults ranged from between 2.1% (95%CI: 1.4 to 2.8) to 47.2% (95%CI: 43.6 to 50.8) in adults. Among men, the crude prevalence ranged from 6.2% (95%CI: 4.0 to 8.4) to 48.9% (95%CI: 42.3 to 55.5) and 10% (95%CI: 8.1 to 12) to 47.3% (95%CI: 43 to 51.6%) for women.

[12] Of the four women who had both pre and post measurements, all four had pre-measurements in the hypertension ranges, and three for the post measurements.
[13] U.S. Centers for Disease Control, "Defining Adult Overweight and Obesity," accessed February 5, 2020, https://www.cdc.gov/obesity/adult/defining.html. A BMI of 25.0 to <30 was within the overweight range. A 30.0 or higher was classified as within the obese range.
[14]I.I Chukwuonye, A. Chuku, C. John, K.A.Ohagwu*, et al.* in a 2013 systematic review of obesity in Nigeria based on four studies reported that the prevalence of overweight ranged from 20.3%–35.1%. They reported that the prevalence of obesity ranged from 8.1%–22.2%. This was the most recent study found in the literature. This paper was assessed on September 25, 2019.
[15] Okubadejo *et al.* in a 2019 paper compared blood pressure readings of 5365 subjects in urban areas of Lagos, Nigeria to American College of Cardiology/American Heart Association 2017 guidelines. They found 55% of adults to be hypertensive.