Effects of Still Point Inducer on the Autonomic Nervous System

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Abstract

Purpose:
The purpose of this investigation is to determine if the still point inducer (patent pending) affects the autonomic nervous system evaluated by the heart rate variability (HRV). The still point inducer (patent pending) is a device made of latex that can be used by a person to induce a still point. A still point occurs when there is an alteration in the craniosacral system. The craniosacral flow may be stopped during filling or emptying. The purpose of this study is to provide a valid tool that can be utilized for home treatment.

Methods:
The subjects participated in a one-time treatment utilizing a therapeutic device called a still point inducer or a sham treatment. Heart rate variability measurements were taken pre and post treatment. Fifty-five subjects participated in the study. Twenty-eight subjects were randomly assigned to the experiment group and 27 subjects were assigned to the control group. There were 9 subjects in each group that had received a chiropractic adjustment within 48 hours of the treatment. The remaining subjects had not received a chiropractic adjustment within 48 hours prior to participating this study. A T-test was utilized to analyze all data.

Results:
There was statistical significance noted between pre and post measures for total power in the experiment group (pre – 734.04 $\pm$1181, post – 993.06$\pm$1568, P value of .0117). After subdividing the groups there was statistical significance between pre and post measures for mean heart rate in the non-adjusted experiment group (pre – 78.88$\pm$17.72, post – 76.34$\pm$17.37 with a statistically significant P value of .0066) and statistical significance between pre and post measures for total power in the adjusted experiment group (pre – 464.56$\pm$328.19, post – 812.43$\pm$275.79 with a statistically significant P value of .0127).

Conclusion:
The self- treatment therapeutic still point inducer (patent pending) is effective in improving heart rate variable measures after a 10-minute treatment session. This improvement correlates to a more responsive autonomic nervous system.

Key Words:
Still point inducer (patent pending), craniosacral therapy

Introduction

Many types of cranial manipulation have been used by doctors of osteopathic and chiropractic for years. Craniosacral therapy is one form of cranial manipulation. This form of treatment is based on the theory that manipulation of cranial bones affects the CSF rate, dural attachments, and myofascial components, therefore affecting all muscles, nerves, and bones indirectly. The craniosacral system provides a craniosacral motion of a rhythmic mobile activity, a cyclical flexion and extension, persisting throughout a human's lifetime. (1) This craniaosacral motion consists of an extension phase and a flexion phrase. In the extension phase of the rhythm, the input of CSF is either shut off completely or is significantly less than the outflow, where as in the flexion phase, the input of CSF is greater than the output. The flexion phase is one of filling, and the extension phase is one of emptying. (4) The CSF rate or cyclical motion is approximately 6-12 cycles per minute (cpm). (1) In 1939, Sutherland discovered the existence of cranial bone movement. He accounted for the motion between the cranium and sacrum, a rhythmic synchrony, based on the tubular spinal dura mater continuity that connects the occiput to the sacrum. As well, he placed the sphenoid as the osseous keystone of the cranium that supplied a driving force, transmitted via articular relationships, to the rest of the osseous cranium. He later suggested that this keystone sphenoid movement was in response to the cerebrospinal fluid circulatory fluctuation. (1) Soon after, Dr. John Upledger developed craniosacral therapy. One of the techniques used for treatment to modify the craniosacral rhythm is the CV-4 (compression of the fourth ventricle). Upledger postulates that the CV-4 technique affects all nerves along the wall of the ventricle. Enhancing fluid and tissue motion, especially that of the connective tissues throughout the body, and restoring flexibility of the autonomic response, the CV-4 technique functions as a shotgun technique for a multitude of problems, even lowering a fever by as much as 4° F in as little as 30-60 minutes (1). Upledger later developed a device called a still point inducer (patent pending), which was used for self-treatment to stimulate the CV-4, effectively self-inducing a craniosacral rhythmical impulse (C.R.I.). This device was similar to two tennis balls tethered in tandem so they are touching each other (5). The question posed is, does the still point inducer produce similar results to the CV-4 manual technique?

Cranial manipulation can alter sleep latency and sympathetic nerve activity in humans: a pilot study by M.J. Cutler et al of muscle sympathetic nerve activity (MSNA) as a potential mechanism for altered sleep latency was assessed. The study involved 20 subjects. The 3 random treatment categories included a CV-4, CV-4 sham, and a non-treatment group. Sleep latency was decreased with the CV-4 treatment group. Postganglionic MSNA measured from the peroneal nerve decreased in the CV-4 group. Heart rate and blood pressure offered no change. (3)

Hanten, WP et al, evaluated the effectiveness of the CV-4 technique on subjects with tension-type headaches. Three groups were involved: a CV-4, a resting position, and a non-treatment group. There was a significant difference between groups with the CV-4 group having significant improvement in both intensity and affect scores using Tukey tests. This research concluded that the CV-4 technique was effective for treatment of patients with tension type headaches. (2)

It has been theorized that the CV-4 technique affects the sympathetic nervous system causing sympatheticotonia to diminish. If the CV-4 manual technique does in fact affect the sympathetic nervous system then the still point inducer (patent pending) should elicit the same effect. If this were true it would be of significant benefit to the patient. The patient would have the ability to assist in self-management of his or her own care. As the craniosacral system is recognized as a functioning physiological system that is intimately related to the vascular, respiratory, nervous, musculoskeletal, and endocrine systems and with the ability for easy self-management techniques there should be improved health with use.

The purpose of this investigation was to determine if the still point inducer (patent pending) affects the autonomic nervous system. The still point inducer (patent pending) is a device made of latex that can be used by a person to induce a still point. A still point occurs when there is an alteration in the craniosacral system, specifically a momentary pause in craniosacral motion. The craniosacral flow may be stopped during filling or emptying. (4) The purpose of this study is to provide a valid tool that can be utilized for home treatment. It was hypothesized that there would be a change in a patient's heart rate variability after the use of the still point inducer (patent pending).

Materials and Methods

The study consisted of two groups, a treatment and a control group. Subjects were recruited from a chiropractic college student body (trimesters 1-9), staff, and faculty. Any subject that indicated a current or previous condition that would affect intracranial pressure such as a CVA, encéphalopathies, brain trauma or any seizure disorders were excluded from the study. Subjects were between 18 and 65 years of age. There were a total of 55 subjects in the study. Twenty-eight subjects were randomly assigned to the treatment group and 27 subjects were randomly assigned to the control group.

All subjects filled out a health questionnaire and an informed consent (Appendix B) prior to receiving treatment. Subjects were then randomly placed in the treatment or control group.

1) Subjects were required to lie supine in a quite room.

2) Measurements using the heart rate variable monitor were taken prior to treatment.

3) The treatment group was positioned with the still point inducer (patent pending) placed so that the mounds of the inducer were to the sides of the external occipital protuberance. The subject remained in this position for 10 minutes. After this time, a second HRV reading was taken.

4) The control group was positioned with a 1-inch thick book placed under their head. The subject remained in this position for 10 minutes. After this time, a second HRV reading was taken.

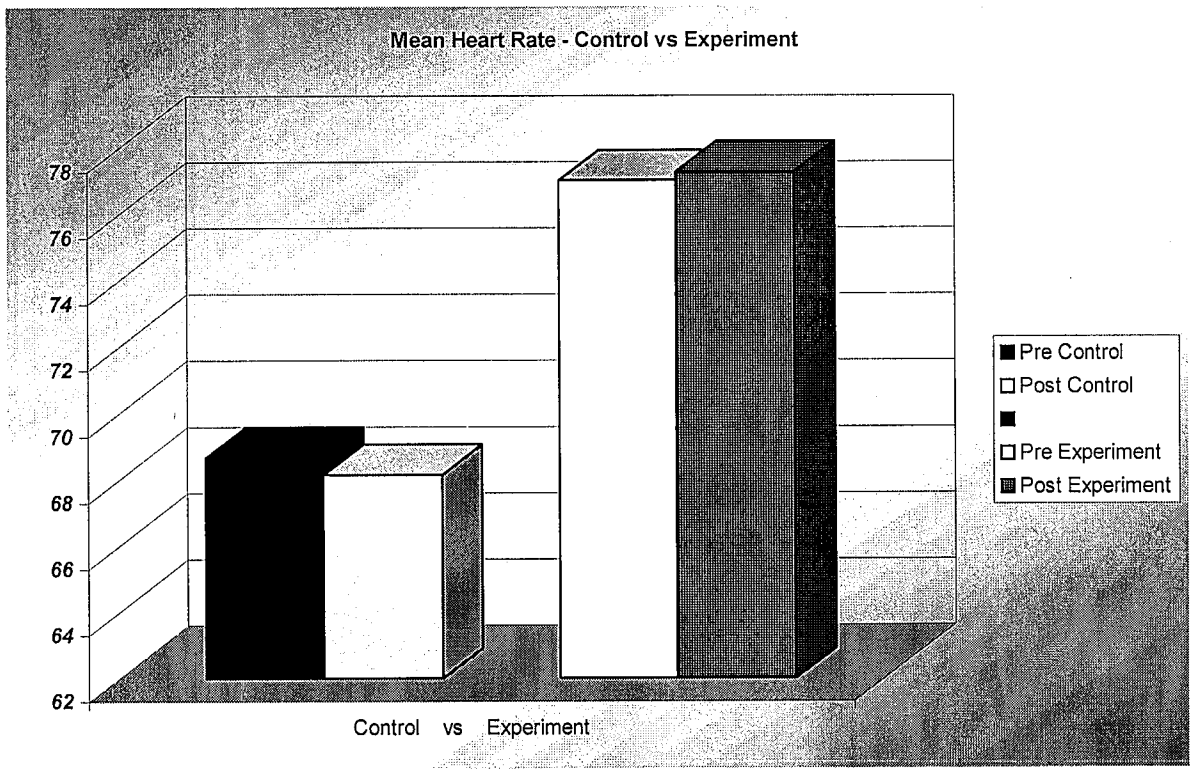
Results

Fifty-five subjects participated in this study. Twenty-eight subjects were randomly assigned to the control group and 27 subjects were assigned to the experimental group. The subjects were further divided into subgroups. Nine subjects in each group had received some form of an adjustment within 48 hours of participating in this study, leaving 19 subjects in the control group and 18 subjects in the experimental group that had not received a chiropractic adjustment within 48 hours prior to participating in the study.

Heart rate variability data was analyzed using a T- test. A P value of less than 0.05 was considered statistically significant.

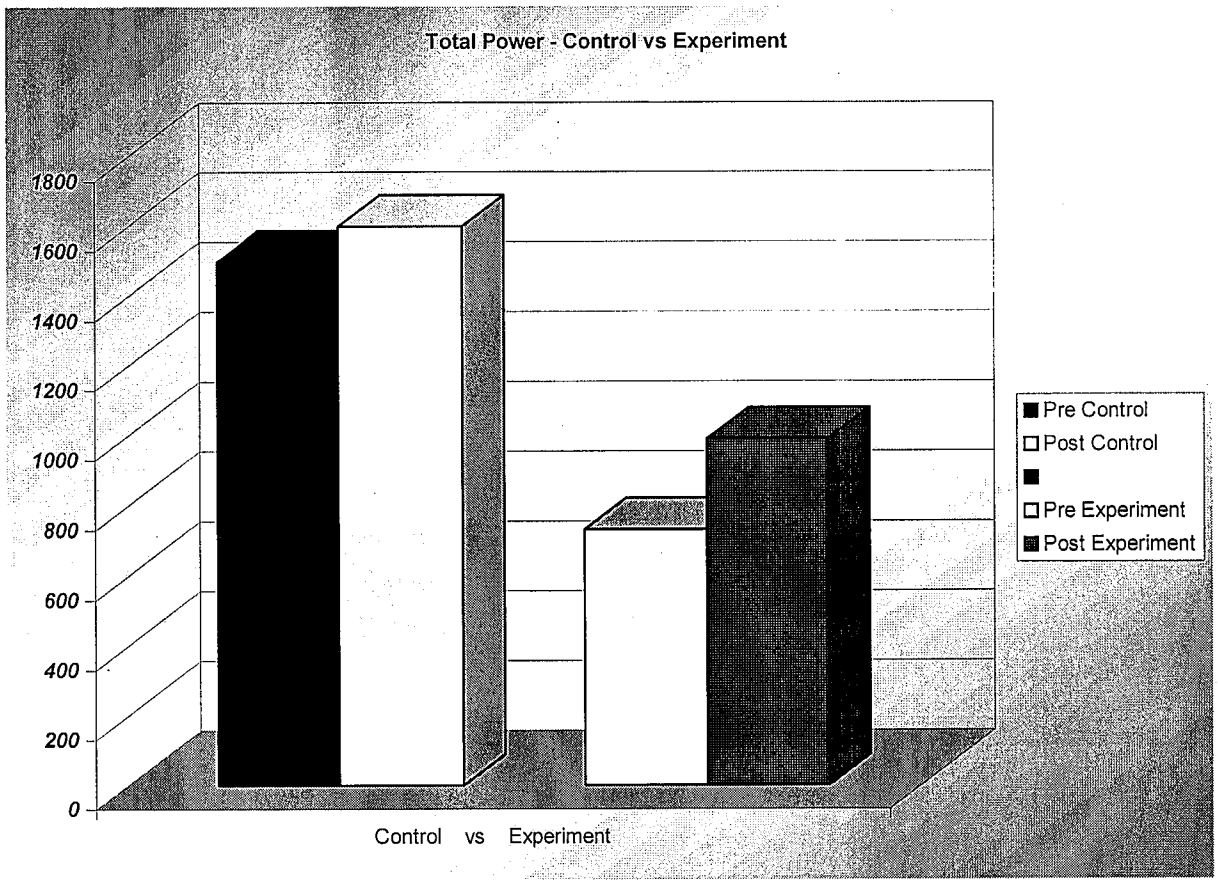
1. Effects of still-point inducer (patent pending):

Heart rates were collected pre and post for both the treatment and sham treatment groups. Average pre and post heart rate measurements for the total group are as follows: control group pre – 68.68, post – 68.15 with a P value of .4337, experiment group pre – 77.05, post – 77.31 with a P value of .9138.



Total power was collected pre and post for both the treatment and sham treatment groups. Average pre and post total power measurements for the total group are as follows: control group pre – 1501.95, post – 1602.93 with a P value of .4562, experiment group pre – 734.04, post – 993.06 with a statistically significant P value of .0117.

Total power was then divided into three components: very low frequency (VLF), low frequency (LF), and high frequency (HF). When analyzing these three factors for the experiment group a statistically significant P value of 0.037 was noted for LF with pre LF measuring 368.03 and post LF measuring 559.59. VLF and HF were not statistically significant in the experiment group. When analyzing the three factors for the control group there was no statistical significance for any of the factors.



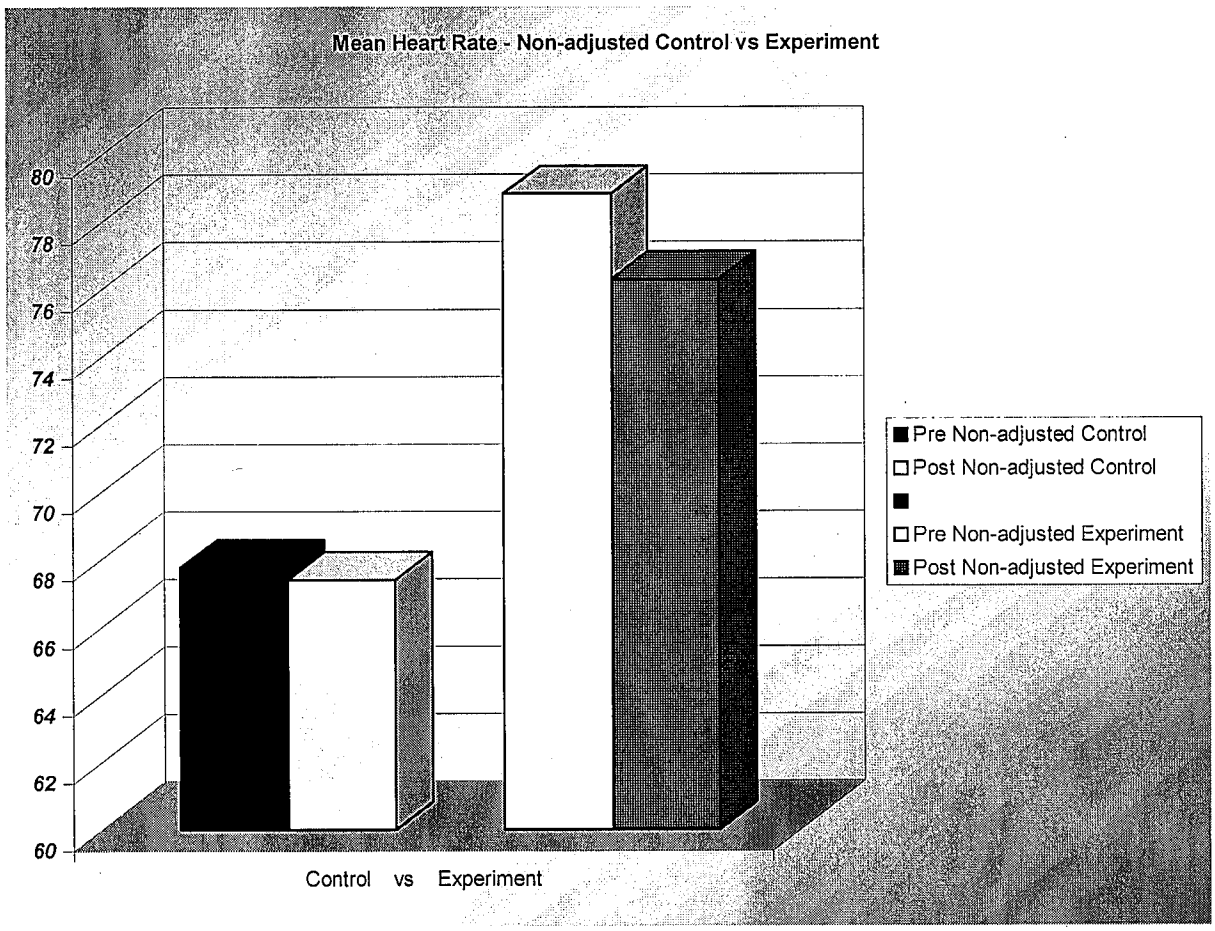
An additional T-test analysis was preformed to determine the continuity between the control and experiment group. There was a statistically significant difference between the two groups on pre treatment HRV for mean HR, total power, VLF, and HF. Pre measurements were as follows: mean HR – control group- 68.68 ±11.71, experiment group – 77.05 ±15.65 with P = .024, total power – control group – 1501.95 ±1022.15, experiment group – 734.04 ±1180.93 with P = .017, VLF – control group – 372.50 ±298.51, experiment group – 163.63 ±146.02 with P = .001, HF – control group 548.41 ± 324.37, experiment group – 222.11 ± 489.15 with P = .053. There was a statistically significant difference between the two groups on post treatment HRV for mean HR and VLF only. Post measurements were as follows: mean HR

– control group – 68.15 ±11.76, experiment group – 77.31 ± 17.92, with P = .014, VLF control group – 525.64 ± 597.97, experiment group – 184.57 ±110.50 with P = .001.

2. Comparing with and without chiropractic care:

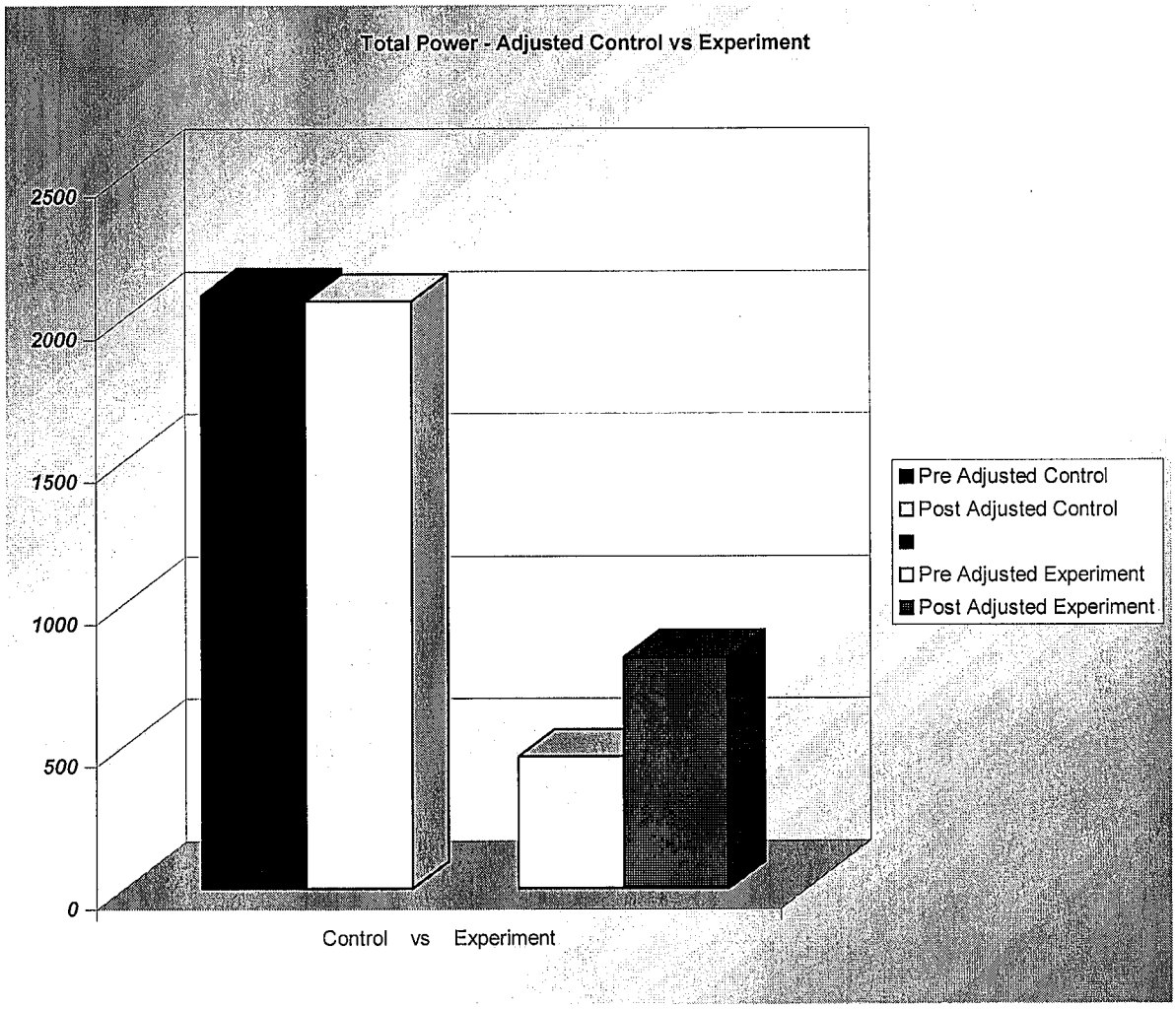
After subdividing the groups into the non-adjusted and adjusted groups they were analyzed for heart rate, total power, VLF, LF, and HF.

The heart rate measurements were as follows: non-adjusted control group pre – 67.78, post – 67.41 with a P value of .4536. Non-adjusted experiment group pre – 78.88, post – 76.34 with a statistically significant P value of .0066. Adjusted control group pre heart rate – 70.57, post – 69.73 with a P of .6721. Adjusted experiment group pre – 73.38, post – 79.37 with a P value of .4261



The total power measurements were as follows: non-adjusted control group pre – 1226.98, post – 1384.89 with a P value of .2869. Non-adjusted experiment group pre – 868.79, post – 1083.38 with a P value of .1264. Adjusted control group pre – 2082.42, post – 2063.23

with a P of .9538. Adjusted experiment group pre – 464.56, post – 812.43 with a statistically significant P value of .0127.



When assessing the three components of total power, only LF for the adjusted control group showed statistical significance with a P value of .0199 with a pre LF measurement of 865.07 and post LF measurement of 578.39. All other measures for both sub-groups were not statistically significant.

An additional T-test analysis was preformed to determine the continuity between the control and experiment group sub-groups non-adjusted and adjusted. There was a statistically significant difference between the non-adjusted groups on pre treatment HRV for mean heart rate and VLF. Pre P value measurements were as follows: mean heart rate P = .019, and VLF P = .009. There was a statistically significant difference between the non-adjusted groups on post treatment HRV for mean heart rate and VLF. Post P value measurements were as follows: mean heart rate P = .032, and VLF P value = .002.

There was a statistically significant difference between the adjusted groups on pre treatment

HRV for total power, LF and VLF. Pre P value measurements were as follows: total power P value = .014, LF P value = .025, and VLF P value = .028. There was no statistically significant difference between the adjusted groups on post treatment HRV.

Discussion.

Mean Heart Rate:

Over all changes in heart rate between pre and post measurements were not statistically significant except for the subgroup - non-adjusted experiment group. There was a 2.5 decrease in heart rate from pre to post measurement which lead to a statistically significant P value of .0066. This indicates that the use of the still point inducer is beneficial in lowering a persons heart rate and effecting their over all health.

Total Power:

Total power is a measure of overall function of the autonomic nervous system. This includes both the sympathetic and parasympathetic nervous system. The measure is a combination of measures for parasympathetic activity, sympathetic activity and a combination of parasympathetic and sympathetic activity. Higher measurements of total power are indicative of a more balanced autonomic nervous system. Therefore an increase in total power from pre to post measurement would indicate a tendency toward improved autonomic health and therefore a more responsive autonomic nervous system. The results of the t – test showed a statistical significance for both the experiment group and then the subgroup- adjusted experiment group. All experimental groups had an increase in total power of greater than 200. All control groups had an increase in total power of less than 160.
The experiment group had an increase of 259. This was 158 points higher increase than the control group. When assessing the effects of treatment with and without an adjustment it was noted that there was a significant difference between the experiment and control group. The non-adjusted experiment group had an increase of 214. Although the increase was not statistically significant it was 56 points greater than the control group. The adjusted experiment group had an increase in total power of 348, which was 327 points higher than the adjusted control group. There were no significant changes in total power in the control group or either of the control subgroups. These results indicate that the use of the still point inducer has a positive effect on the autonomic nervous system. Even more specifically the use of the still point inducer in conjunction with a chiropractic adjustment may have an even greater beneficial effect on the autonomic nervous system.

After analyzing the three frequency components of HRV: VLF, LF, and HF appears that no one component played a significant role in the overall change of the subject's autonomic nervous system but changes to all components equated to an overall improvement in autonomic health. What was noted was a general tendency for the components to increase post treatment using the still point inducer.

Homogeneity of the subject groups:

An additional T-test analysis was preformed to determine the continuity between the control and experiment group. Of the five categories analyzed four pre treatment measurements showed statistical significance: mean heart rate, total power, VLF, and HF.
After the treatment post measurements showed statistical significance for only two categories: mean heart rate and VLF.

After subdividing the subjects into the two sub-groups: non-adjusted and adjusted a T-test analysis for continuity was assessed. When analyzing the non-adjusted group the continuity between the control and experiment group showed statistical significance for mean heart rate and VLF for both pre and post measurements. Although there was a statistical significance after the treatment there was a trend toward no significance for mean heart rate post treatment P values became less significant. When analyzing the adjusted group the continuity between the control and experiment group showed statistical significance for total power, LF, and VLF for pre treatment measurements. After treatment there was no statistical significance for any of the five measures. This implies that the still point treatment was effective in producing more homogeneity between the control and experiment groups.

Study limitations:

Although the study had 55 participants after subdividing the control and experiment groups into categories of non-adjusted and adjusted the sample size became smaller making it more difficult to determine statistical significance and accuracy. Even with the small sample size there was a statistical significance or a trend toward significance in many of the heart rate variable categories. It would be beneficial to reproduce this study with greater numbers in all subject groups. Another limitation of the study was that it was a one-time treatment. To have multiple treatments over a longer period of time would give a more accurate analysis of the therapeutic effects of the still point inducer treatment on the autonomic nervous system.

Conclusion:

Due to the changes in the heart rate variable measure toward a more responsive autonomic nervous system the still point inducer (patent pending) appears to be an effective and valid tool that can be utilized for patient care. The effectiveness of the tool appears to increase when combined with chiropractic care per data analysis. Due to the small size of subjects having had chiropractic care further studies should be implemented to explore this relationship.

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Appendix A

SUBJECT HEALTH QUESTIONNAIRE FOR THE STILL POINT INDUCER STUDY

Project Title: STILL POINT STIMULATION OF SYMPATHETIC NERVOUS SYSTEM AND ITS AFFECT ON HEART RATE VARIABILITY.

Are you younger than 18 years of age?	Yes	No
Are you older than 65 years of age?	Yes	No
Have you ever had a stroke (cerebral vascular accident)?	Yes	No
Have you ever had an encéphalopathy, or a brain trauma?	Yes	No
Have you ever had any seizure disorders?	Yes	No
Have you had a spinal manipulation within the last 48 hours?	Yes	No

DATE: _____ GROUP: _____

NAME: _____

AGE: _____

GENDER: _____

DATE OF LAST ADJUSTMENT: _____

TECHNIQUE USED: _____

Appendix B

SUBJECT CONSENT FORM FOR THE STILL POINT INDUCER STUDY

Project Title: STILL POINT STIMULATION OF SYMPATHETIC NERVOUS SYSTEM AND ITS AFFECT ON HEART RATE VARIABILITY.

Logan college student researchers, Mary Harpell and C. Scott Huff, have requested my participation in the above titled research study. I understand the purpose of this research is to assess the effectiveness of affecting the sympathetic nervous system by using a Still Point Inducer.

I understand that my participation will consist of a one time treatment lasting 10 minute.
I will be required to lie supine in a quite room with a device placed under my head.

I understand that I will not be told whether I am in the treatment or the control group.

I understand that possible risks of receiving a still point inducer treatment are extremely rare, however, the research investigators and/or others will respond to any concerns with appropriate emergency and/or safety procedures. I understand that possible risks may include light headedness, headache, and tenderness in the occipital region and in the neck.

I understand that the researchers may terminate my participation without my consent if, in their judgment it is in my best interest.

I understand that I have the right to discontinue my participation at any time without penalty or prejudice.

I understand that the results of this study may be published, but my name or identity will remain confidential. Any questions I have concerning this study have been/will be answered by either Mary Harpell or C. Scott Huff. If I have any other concerns regarding my participation or believe I have been injured as a result of my participation, I may contact John Gutweiler, PhD., Chairperson of the Logan College Institutional Research Board (phone 636-227-2100, ext. 1910).

I have read the above statements and have been able to ask questions and express concerns, which have been satisfactorily answered by the researchers. I understand the purpose of the study as well as my participation and the risks involved. I hereby give my informed and free consent to be a participant in this study.

_____ _____

SIGNATURE DATE

_____ _____

WITNESS DATE