The Effects of Spinal Manipulation on Menstrual Distress: A Pilot Study

Kari Schmidt
Ali Schweitzer
Jamie Tripp
Advisor: Dr. Heidi Crocker

Abstract:

Dysmenorrhea is a common condition that affects many women across the world. This study aims to identify a possible treatment option of Chiropractic spinal manipulation. Subjects received a lumbar Diversified adjustment twice a month during their luteal phase for three consecutive months and were questioned with a pre and post survey as well as a Visual Analog Scale (VAS) to gauge their pain levels.

After three months, 95% of the subjects reported a decreased VAS. The pre and post survey consisted of 40 questions, in which, 37 questions improved, 2 stayed the same and only 1 question decreased slightly. Approximately, 84% of the subjects had an improvement in their average questionnaire score between pre and post study.

Based upon this information, Chiropractic spinal manipulation is a valuable tool among the treatment options for dysmenorrhea. Since this is a rather small pilot study, more elaborate and larger studies are needed to determine the effectiveness of spinal manipulation for dysmenorrhea.

Key Words: Dysmenorrhea, Spinal Manipulation, Diversified Technique

Introduction:

With an upwards of 90% of adolescent women suffering from menstrual distress, finding an effective treatment would benefit a significant amount of females.[1] Our hypothesis is that spinal manipulation of the lumbar spine will lead to a decrease in menstrual distress symptoms such as dysmenorrhea, low back pain, headaches, bloating and flank pain. Premenstrual syndrome is also referred to as the late luteal phase dysphoric disorder.[2] The menstrual cycle is divided into three phases: follicular, ovulation and luteal phases. The follicular phase begins on the first day of menstruation while the egg is maturing. This phase ends when ovulation occurs. At this point, the egg has matured and is being released from the ovary. Then the luteal phase begins. Most of these menstrual distress symptoms typically occur during this phase. Primary dysmenorrhea is defined as painful menses in women with normal pelvic anatomy. Dysmenorrhea can also be secondary to organ pathology. Dysmenorrhea has been identified as one of the most frequent causes of time lost from work and school in the United States.[3] Primary dysmenorrhea is characterized by crampy pelvic pain beginning before or at onset of menstruation, breast tenderness, abdominal pain, bloating, swelling, headache, weight gain, back ache, food cravings, irritability, depression, anxiety, mood changes, fatigue, crying spells and sleep disturbances.[4] In very severe forms, premenstrual syndrome is considered a depressive mood disorder.[5]

There are differing schools of thought as to what exactly causes dysmenorrhea. Some believe that the alterations of the ligamentous and neurological mechanics between the sacrum and the uterus can cause symptoms of dysmenorrhea and that chiropractic adjustments can positively affect symptoms of dysmenorrhea.[6] Another chiropractic hypothesis suggests that reducing tension on the broad ligament by adjusting sacral position will also alleviate symptoms.[7]

Overall there have been numerous treatments recommended for dysmenorrhea. Currently, the two most popular medical approaches are Non-steroidal Anti-inflammatory drugs and oral contraceptives. Adverse effects of these medical treatments and failure rates of up to 25% have caused women to seek other forms of treatments.[6 8 9] Natural treatments vary from several different types of chiropractic adjustments, acupuncture[10], herbal remedies, lifestyle changes (exercise)[11], magnets[12], and diet related changes to name a few.[13] Many practicing chiropractors utilize adjustments as a treatment for dysmenorrhea. Holtzman et al. found that menstrual pain associated with dysmenorrhea was alleviated when adjustments based upon motion palpation were given to the low back area with drop tables known as Thompson technique.[14] In this pilot study, diversified chiropractic adjustments will be given to the low back area. This includes the joint between the last thoracic vertebra and first lumbar vertebra down to and including the sacrum. This is a high velocity low amplitude adjustment with a directional force given after the Doctor of Chiropractic, Heidi Crocker, palpates for subluxations (or slight misalignments within the spine.) One previous spinal manipulative study and its effects on dysmenorrhea did not provide significant clinical results.[15] In that particular study, adjustments were given on days 1-4 of menstruation. Our study only adjusts during the luteal phase, which is the 2 weeks prior to menstruation.

The specific goals of this experiment are to find out if spinal manipulation to the low back area for three consecutive months would help decrease the symptoms of menstrual distress.

Materials and Methods:

An informational meeting was held on May 18, 2010 for people interested in learning more about the study or wanting to participate. Participants were recruited through flyers posted around Logan College of Chiropractic campus (Appendix A), classroom announcements made to each room, and word of mouth to students and faculty. During the informational meeting a brief description of the research project was given. Participants were given the exclusion criteria, what to expect of each adjustment, how appointments would be scheduled and the time commitments of the study. The participants were then given the chance to ask any questions and were given a Menstrual Distress Questionnaire (Appendix B) to fill out. The Questionnaires were looked at, and of the 45 filled out 26 were accepted into the study. The 26 participants were then given a welcoming letter (Appendix C) further explaining the study and signed an informed consent form (Appendix D).

Of the 26 participants accepted into the study 19 participated for the whole duration of the study. The participants were all females in the age range of 18-45, they were students at Logan College of Chiropractic, and they each experienced at least one symptom of menstrual distress on a cyclical basis. The participants, with the exception of one, had none of the following previous conditions: current, or recent, pregnancy, use of an intrauterine device, use of prescription analgesics, or have been diagnosed with one the following: pelvic inflammatory disease, endometriosis, ovarian cysts, adenomyosis, cervical stenosis, fibroid polyps, mental illness or clinical depression and amenorrhea. One participant had been treated for endometriosis and had been told by medical doctors that she no longer had endometriosis. This participant was allowed into the study for additional information to see how she would respond, but her data was not calculated into the actual results. The participants were also not allowed to have anything below the thoraco-lumbar junction adjusted during the course of the study, except by Dr. Crocker.

Prior to the first appointments the participants had to provide the first day of their last menstrual cycle, which was answered on the Menstrual Distress Questionnaire (Appendix B). The student researchers then calculated the first set of appointments for each based on a 28-day menstrual cycle. Each participant was assigned to a student researcher with whom they set up appointments. The participants came in twice during the luteal phase of their menstrual cycle. The participants filled out a symptom survey before each adjustment (Appendix E). Dr. Crocker delivered a Diversified adjustment to each participant in the region from T-12 through the sacrum. Motion and static palpation were used to find specific areas of fixation and then adjustments were made to the appropriate segments. Following each adjustment, the participant set up additional appointments based upon their individual menstrual cycle. This was done for three consecutive menstrual cycles, with each participant being treated a total of six times. On the last appointment each participant filled out the Menstrual Distress Questionnaire (Appendix B) to be used as comparison to the initial questionnaire.

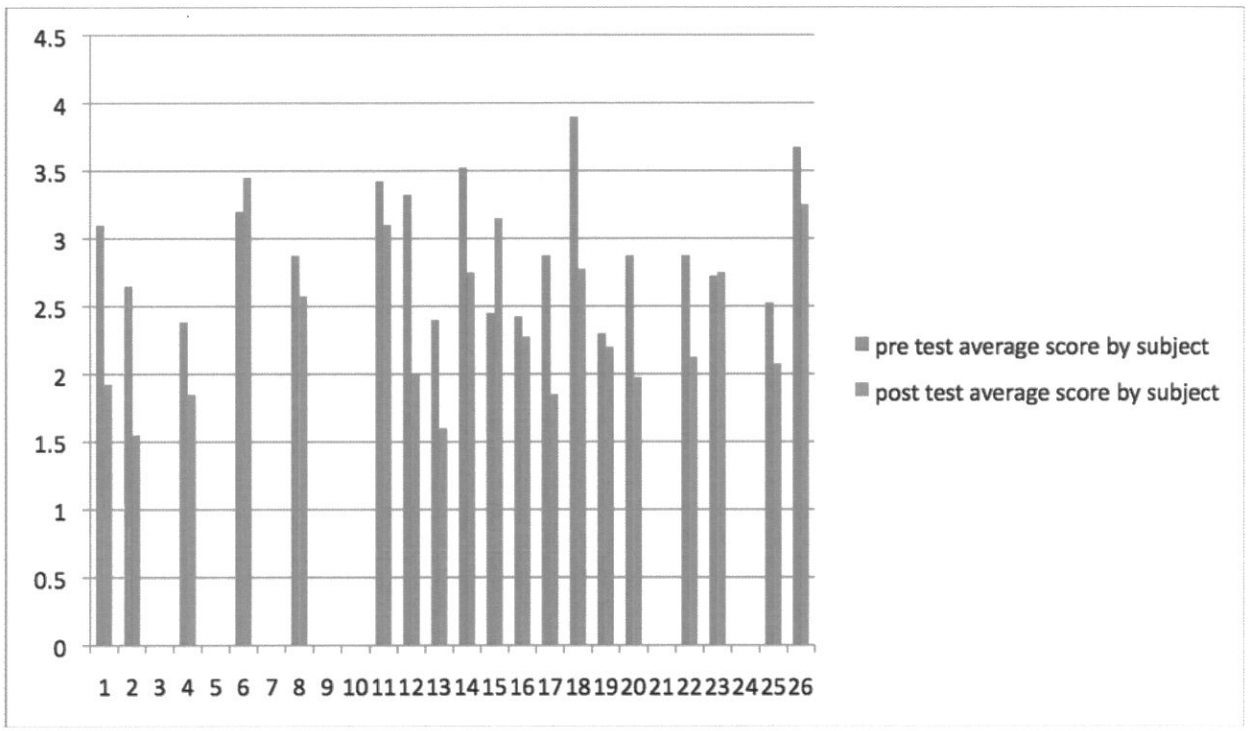
The subjects used a rating scale of 1-5 to indicate whether they experienced these symptoms never, rarely, sometimes, often, or always. For most of these questions, a 5 would show the most severe symptoms, and a 1 the least severe symptoms. There were 5 questions (question 3, 4, 11, 12, and 14) in which the wording was reversed so that a 1 would be more severe than a 5, for example "I experience my usual level of energy during menstruation". For these 5 questions, the researchers used the inverse of the responded answer (i.e. 1=5, 2=4, etc.) so that they would be represented properly when overall averages were created.

Results:

Before the study began, each participant took a 40-question survey. Each question was related to the experience of a certain menstrual distress symptom. A table of the pre treatment and post treatment results are located in appendix F and G respectively.

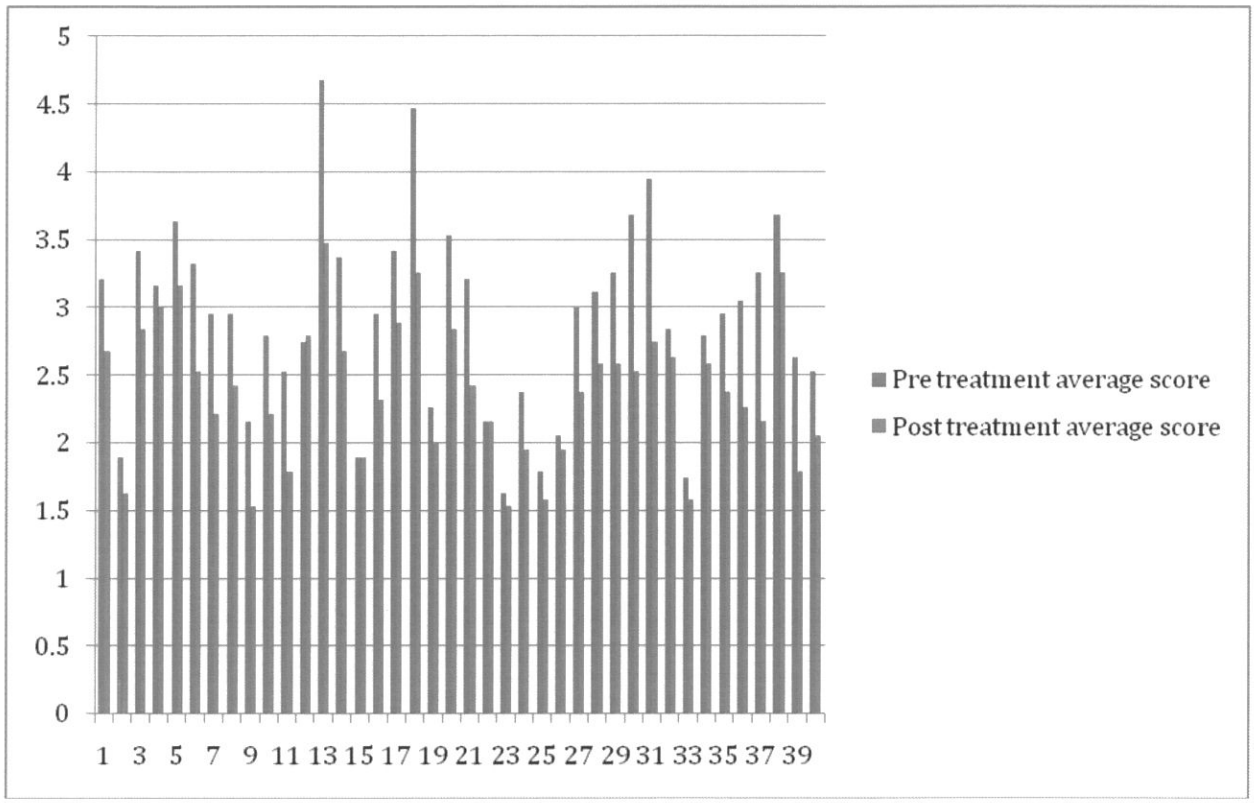
The overall averages were calculated for each subject before and after the treatment. This data can be seen in Fig.I. Appendix H contains a table with the raw data comparing the pre test subjects' averages to the post test subjects' averages. Overall, of the 19 subjects that completed the study, 16 of them had an improvement in their average questionnaire score from pre treatment to post treatment.

Fig I Pre vs. post treatment scores sorted by subject



Averages were also calculated for each of the 40 questions in the symptoms survey before treatment and after treatment. This data can be seen in Fig. II. Appendix H contains a table with the raw data comparing the pre test question averages to the posttest question averages. Of the 40 questions, the average score amongst all subjects improved on 37 of the questions, remained the same on 2 questions, and decreased slightly on 1 question.

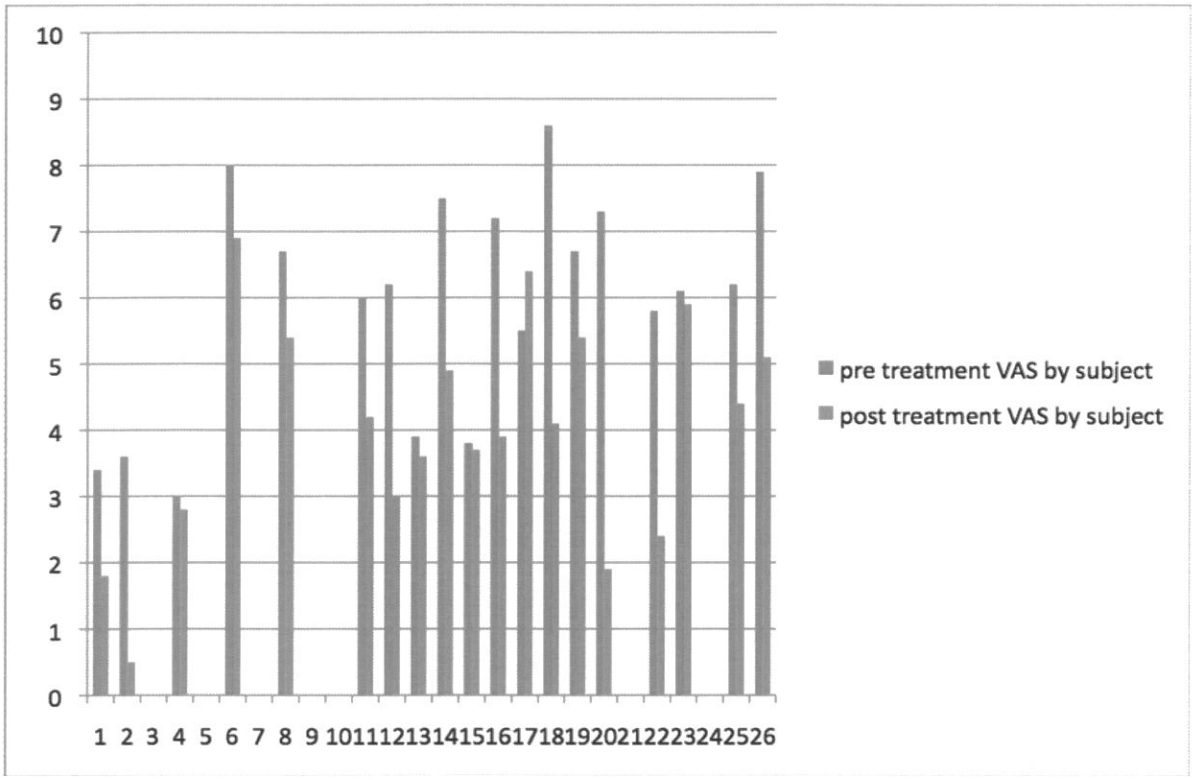
Fig. II Pre vs. post treatment average score sorted by question



When a paired t test was performed on the 19 subjects' average survey scores pre and post treatment, the two-tailed p-value was found to be .0003. The mean pre minus the mean post was found to be .541 with 95% confidence interval from .283 to .799.

In addition to the 40 questions in the symptom survey, each subject put a mark on a 10-centimeter line indicating their overall level of pain during their cycle (VAS). The results of this are shown in Fig. III and the raw data is found in Appendix I. Of the 19 subjects, 18 had a decrease in VAS after the course of the 3-month treatment, and one reported an increase in pain. The average difference in pain among the 19 subjects was a decrease of 2.0 out of 10. Based on a paired T-test, the two-tailed p-value was found to be less than 0.0001.

Fig. III Pre treatment vs. Post treatment VAS



Discussion

Although our study was limited by the number of participants the data shows a significant decrease in most areas of menstrual distress when receiving spinal manipulation. The data showed that of the 40 areas of concern 37 of them were improved during the course of the study. Of the 19 subjects who participated 16 showed a decrease in symptoms and reported experiencing less menstrual distress during their menstrual cycle. The areas where the most change was seen were experiences of cramping, bloating, abdominal heaviness with menstruation, cramps that began the first day of menstruation, aching of lower back, abdomen, and inner thighs during the first day of menstruation. These areas of discomfort saw the greatest positive improvement during the course of the study.

Statistic analysis provided a p-value of 0.0003 for the averages of each of the 19 participants' pre and post scores on the menstrual distress questionnaire. This is statistically significant and supports the hypothesis that the use of spinal manipulation will decrease the symptoms of menstrual distress. The visual analogue scale had a p-value of 0.0001, which is again statistically significant and supports the hypothesis of the study based on the subjectivity of the participants.

While this study did support the hypothesis future studies are needed to provide more information on the topic of spinal manipulation and its effects on menstrual distress. This study was very limited in that all 19 participants of the study were students enrolled in chiropractic school, and were biased towards the effects of spinal manipulation and the role it plays on the body and the nervous system. Also the

number of participants was very small, a larger sample size would be recommended to see more accurate results. Another limitation was the way in which the appointments were set up and the tracking of each participant's menstrual cycle. All participants were based on a 28 day cycle, so the accuracy of finding the luteal phase may not have been complete. In future studies a better way of tracking each participant's menstrual cycle should be used.

Overall the study showed that the use of spinal manipulation was beneficial in the relief of a variety of symptoms related to menstrual distress. Future research needs to be done to further expand on this topic, but this pilot study is a good start for people seeking a more natural approach to helping those with menstrual distress.

Conclusion

Overall, this pilot study gave very promising data for further research. The changes in both the VAS scores and the symptom survey were statistically significant showing that the menstrual distress symptoms of the subjects in this study improved after only 6 diversified adjustments to the lumbar spine and pelvis. One of the major limitations to this study was that all 19 of the subjects were students in chiropractic school. This is likely to make the bias toward having the treatment be successful in treating their symptoms. A necessary follow-up study would be to see if the same results were obtained with a non-biased population. Additionally, because this was a pilot study, all of the subjects were in the treatment group. An additional study would need to include two groups randomly assigned to an adjustment group and a placebo adjustment group. This would show with greater certainty that the effects seen in this study were truly significant in comparison to a similar group not receiving chiropractic adjustments. Participants would have to be naïve to chiropractic procedures so that a sham process could be used in a double-blind design.

Included is the data showing an improvement for subject 26, who had been treated medically for endometriosis, but her values were not calculated.

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Appendix A

ARE YOU SUFFERING FROM

MENSTRUAL DISTRESS

JOIN OUR RESEARCH STUDY

INFORMATIONAL MEETING TUESDAY MAY 18, 2010
ROOM 142B

IF YOU ARE UNABLE TO ATTEND THE MEETING AND ARE STILL INTERESTED IN THE STUDY CONTACT

Ali Schweitzer- allison.schweitzer@logan.edu
Kari Schmidt- kari.schmidt@logan.edu
Jamie Tripp- jamie.tripp@logan.edu

Appendix B

Menstrual Distress Questionnaire

		Never	*Rarely*	*Sometimes*	*Often*	*Always*
1)	I have mood changes associated with menstruation	1	2	3	4	5
2)	I miss work, school, or other regularly scheduled activities due to menstrual discomfort	1	2	3	4	5
3)	My eating habits are the same during menstruation as any other time in my cycle	1	2	3	4	5
4)	I experience my usual level of energy during menstruation	1	2	3	4	5
5)	I have back pain associated with menstruation	1	2	3	4	5
6)	I experience significant menstrual distress on a monthly basis (N=0x/year, R=1-3mo/year, S=4-6mo/year, O=7-9mo/year, A=10-12mo/year	1	2	3	4	5
7)	I have experienced headaches or dizziness before or during menstruation	1	2	3	4	5
8)	I feel sad, depressed, blue, and/or cry easily before/during menstruation	1	2	3	4	5
9)	I have experienced nausea and/or vomiting before/during menstruation	1	2	3	4	5
10)	It is difficult to be pleasant when I am menstruating	1	2	3	4	5
11)	Even though I am menstruating, I am able to perform my daily functions without problems	1	2	3	4	5
12)	My bowl habits are the same during menstruation as other times in my cycle	1	2	3	4	5
13)	I experience cramping, bloating, and/or abdominal heaviness with menstruation.	1	2	3	4	5
14)	My moods are the same during menstruation as other times in my cycle	1	2	3	4	5
15)	I have hot or cold sweats, fevers, and/or chills associated with menstruation	1	2	3	4	5
16)	Physical activity is more difficult for me during menstruation	1	2	3	4	5
17)	I feel irritable, easily agitated, and impatient a few days before my period	1	2	3	4	5
18)	I have cramps that begin on the first day of my period	1	2	3	4	5
19)	I feel depressed for several days before my period	1	2	3	4	5

20) I have abdominal pain or discomfort, which begins one day before my period	1	2	3	4	5
21) For several days before my period I feel exhausted, lethargic, or tired	1	2	3	4	5
22) I only know that my period is coming by looking at the calendar	1	2	3	4	5
23) I take a prescription drug for the pain during my period	1	2	3	4	5
24) I feel weak and dizzy during my period	1	2	3	4	5
25) I feel intense and nervous before my period	1	2	3	4	5
26) I have diarrhea during my period	1	2	3	4	5
27) I have backaches several days before my period	1	2	3	4	5
28) I take aspirin for the pain during my period	1	2	3	4	5
29) My breasts feel tender and sore a few days before my period	1	2	3	4	5
30) My lower back, abdomen, and the inner sides of my thighs begin to hurt or be tender on the first day of my period.	1	2	3	4	5
31) During the first day of so of my period, I feel like curling up in bed, using a hot water bottle on my abdomen, or taking a hot bath	1	2	3	4	5
32) I gain weight before my period	1	2	3	4	5
33) I am constipated during my period	1	2	3	4	5
34) Beginning on the first day of my period, I have pains which may diminish or disappear for several minutes and then reappear.	1	2	3	4	5
35) The pain I have with my period is no intense, but is a continuous dull aching	1	2	3	4	5
36) I have abdominal discomfort for more than one day before my period	1	2	3	4	5
37) I have backaches which begin the same day as my period	1	2	3	4	5
38) My abdominal area feels bloated for a few days before my period	1	2	3	4	5
39) I feel nauseous during the first day or so of my period	1	2	3	4	5
40) I have headaches for a few days before my period	1	2	3	4	5

41) How would you rate your overall menstrual discomfort? (Place an X on the line at the appropriate location.)

no pain ———————————————————————— severe pain

42) I am between the ages of 18-45?
Yes_____ No_____ my age is? _____

43) My last menstrual cycle started?
Date _____

44) I am presently using birth control
Yes_____ No_____ if so which kind? _____

45) I am now pregnant, plan to conceive during the duration of this study, or have had a baby in the past 3 months, use an intrauterine device (IUD) or have been diagnosed with one of the following: pelvic inflammatory disease (PID), endometriosis, ovarian cyst, adenomysois, cervical stenosis, or fibroid polyps
Yes_____ No_____

46) I began experiencing menstrual discomfort within the first year after onset of menses
Yes_____ No_____

47) I currently have a fracture of my lumbar spine, an abdominal aortic aneurysm, and/or have had precious lumbar spine surgeries?
Yes ____ No _____

48) I currently suffer from mental illness and/or clinical depression
Yes ____ No _____

Appendix D

The Effects of Spinal Manipulation on Menstrual Disorders: A Pilot Study

I_____ have been asked by Dr. Heidi Crocker to participate in the research study called "The Effects of Spinal Manipulation on Menstrual Disorders: A Pilot Study", sponsored by the Research Department at Logan College of Chiropractic. The purpose of this study is to see if spinal manipulation of the lumbar spine has an effect on the discomforts of menstrual distress. The spinal manipulation given is a high velocity low amplitude thrust applied to areas of motion restriction and palpated deviations in areas of the lower thoracic spine, lumbar spine, pelvis and sacrum. These techniques have been explained to me and demonstrated at the informational meeting I attended.

I understand that my participation in this study is voluntary and that my participation may require me to:

a. Participate in the study for two visits, in the luteal phase, per cycle for three consecutive menstrual cycles.
b. Complete a questionnaire before and after the study and a symptom survey before each treatment.
c. Attend a pre participation informational meeting.

I have been told that my participation in the study may not produce a direct benefit to me through the experiment.

I understand that the results of this study may be published and/or made public. My name or identification associated to my name, or my file of vital information will not be revealed to anyone not directly associated with the study (i.e. testers or supervisors). All of my personal information will remain confidential.

I have been informed of the possible risks from the effects of the spinal manipulations which are limited, but may include muscle tenderness or soreness after the adjustment and the very unlikely possibility that the menstrual symptoms may worsen after the treatment.

At any time if I feel that I am at risk of injury, I will be allowed to stop my participation and be excused from the study. I may also be excused from the study at the discretion of the investigators without any penalty to me.

In the event that I feel I have suffered an injury as a result of my participation in this study, I will be instructed to contact the Chairman of Logan College of Chiropractic Institutional Review Board, Dr. John Gutweiler at 636-227-2100 Ext. 1910. Dr. John Gutweiler will then refer me to the appropriate individuals to review the matter with me.

I have read the above statements and the student investigators have explained to me regarding the purpose of the research project. I have been able to ask questions and express any concerns with any of the above mentioned procedures dealing with the study. Accordingly, I believe I understand the purpose of this study as well as the potential risks and benefits involved. I hereby give my free and informed consent to participate in this study.

_____ _____

Signature of Subject Date and Time

_____ _____

Print Name of Subject Signature of Witness

Appendix E

Pre Treatment Symptom Survey

Date/Time: _____
Participant ID#: _____
Doctor Treating: _____
Student Investigator Present: _____

Evaluate the following portion of the questionnaire regarding current discomfort. Use the scale 1-10, with 1 being no pain and 10 being severe pain. Please circle the appropriate number.

1. The severity of my current abdominal discomfort is:
   1 2 3 4 5 6 7 8 9 10

2. The severity of my current menstrual related headache is:
   1 2 3 4 5 6 7 8 9 10

3. The severity of my current menstrual related backache is:
   1 2 3 4 5 6 7 8 9 10

For Researcher Use Only

1. Objective findings (static listings/motion restrictions)

2. Areas adjusted

Appendix F

Pre treatment survey (corrected) Questions 1-40

Subject number (thick black lines represent subjects who did not complete the study)

4	1	4	3	3	3	4	1	2	3	1	3	5	4	3	3	4	3	3	3	4	1	3	3	3	1	5	4	2	3	2	4	3	3	2	3	4	5	4	5
2	2	5	3	3	2	2	3	3	2	2	2	5	3	1	3	2	5	1	4	3	3	1	3	1	1	2	3	2	3	4	3	1	3	4	2	3	4	4	1
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4	2	2	1	5	5	5	4	3	3	3	2	5	4	2	3	5	5	4	4	5	5	3	4	2	4	4	3	4	5	5	4	2	2	3	5	3	5	4	4

Appendix H

Pre vs. Post treatment scores sorted by subject

Question	Pre	Post
1	3.21	2.68
2	1.89	1.63
3	3.42	2.84
4	3.16	3
5	3.65	3.16
6	3.32	2.53
7	2.95	2.21
8	2.95	2.42
9	2.16	1.53
10	2.79	2.21
11	2.53	1.79
12	2.74	2.79
13	4.68	3.47
14	3.37	2.68
15	1.89	1.89
16	2.91	2.32
17	3.42	2.89
18	4.47	3.26
19	2.26	2
20	3.53	2.84

Question	Pre	Post
21	3.21	2.42
22	2.16	2.16
23	1.63	1.53
24	2.37	1.95
25	1.79	1.58
26	2.05	1.95
27	3	2.37
28	3.11	2.58
29	3.26	2.58
30	3.68	2.53
31	3.95	2.74
32	2.84	2.63
33	1.74	1.58
34	2.79	2.58
35	2.95	2.37
36	3.05	2.26
37	3.26	2.16
38	3.68	3.26
39	2.63	1.79
40	2.53	2.05

Subject number	Pre treatment average	Post treatment average
1	3.1	1.925
2	2.65	1.55
4	2.385	1.85
6	3.2	3.45
8	2.875	2.575
11	3.425	3.1
12	3.325	2
13	2.4	1.6
14	3.525	2.75
15	2.45	3.15
16	2.425	2.275
17	2.875	1.85
18	3.9	2.775
19	2.3	2.2
20	2.875	1.975
22	2.875	2.125
23	2.725	2.75
25	2.525	2.075
26	3.675	3.25

Appendix I

Pre treatment vs. Post treatment VAS

Pre treatment VAS	Post treatment VAS
3.4	1.8
3.6	.5
3.0	2.8
8.0	6.9
6.7	5.4
6.0	4.2
6.2	3.0
3.9	3.6
7.5	4.9
3.8	3.7
7.2	3.9
5.5	6.4
8.6	4.1
6.7	5.4
7.3	1.9
5.8	2.4
6.1	5.9
6.2	4.4
7.9	5.1