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Self-reported Non-musculoskeletal Responses to Chiropractic: A Multination Survey

In a recent practice-based multi centre study, a pattern was identified of unexpected positive non-musculoskeletal responses (N-MSRs) reported by patients after chiropractic care. However, in that study, because there was no untreated control group, it was not possible to determine whether these responses were caused by the treatment, if they constituted mere signs of natural variation in the human physiology, or if they were figments of imagination.

To determine whether there is a causal link between the treatment and the symptom improvement, it would be necessary to conduct a number of randomized controlled trials. Such studies should include specific and valid outcome measures in relation to each N-MSR under scrutiny. This would be time consuming and expensive and not within the capability of most researchers at this time.

Therefore, to provide stronger data on the potential relationship between treatment and symptom improvement, a similar but expanded approach was taken to determine if the findings in the first study could be replicated in a much larger international sample. Additional objectives of the study were to establish whether N-MSRs were influenced by (a) the chiropractors' attitudes to N-MSR and the information they gave to their patients on this subject, (b) patients' demographic profiles (age, sex, education, and work status), and (c) treatment profiles (type of treatment provided, area treated, number of areas treated, and number of treatments over time).

Information obtained through questionnaires by chiropractors and patients on return visit within 2 weeks of previous treatment from chiropractic practices in Canada, United States, Mexico, Hong-Kong, Japan, Australia, and South Africa. In all, 385 chiropractors collected valid data on 5607 patients. Spinal manipulation with or without additional therapy was the intervention provided by chiropractors. Outcome measures included self-reported improved non-musculoskeletal reactions (allergy, asthma, breathing, circulation, digestion, hearing, heart function, ringing in the ears, sinus problems, urination, and others).

The results from a previous study were largely reproduced. Positive reactions were reported by 2% to 10% of all patients and by 3% to 27% of those who reported to have such problems. **Most common were improved breathing (27%), digestion (26%), and circulation (21%).** Some variables were identified that somewhat influenced the outcome: patients informed that such reactions may occur (odds ratio [OR] 1.5), treatment to the upper cervical spine (OR 1.4), treatment to lower thoracic spine (OR 1.3), and female sex (OR 1.3).

However, these had a very small "explanatory" value (pseudo R^2 3%).

A minority of patients with self-reported non-musculoskeletal symptoms report definite improvement after chiropractic care, and very few report definite worsening. Future studies should use stringent criteria to investigate a possible treatment effect and concentrate on specific diagnostic subgroups such as digestive problems and tinnitus.

Reference:

Leboeuf-Yde C, Pedersen EN, Bryner P, Cosman D, Hayek R, Meeker WC, Shaik JJ, Terrazas O, Tucker J, Walsh M. *Self-reported Nonmusculoskeletal Responses to Chiropractic Intervention: A Multination Survey*. J Manipulative Physiol Ther 2005; 28:294-302.

Chiropractic and Culture Trends - Philosophy and Health for the Age Wave

After a systematic review of relevant literature, this author suggests that a cultural shift is occurring and that a look at cultural trends and their relationship to potential chiropractic patients is useful and applicable for chiropractors and chiropractic educators. A large and influential generation of people, the baby boomers, have been named the "Age Wave" to graphically describe their powerful and sweeping influence and impact on all aspects of the culture, including health care. Some chiropractors have written about the influx of this generation and warned that the chiropractic profession would do well to prepare, citing the potential of huge numbers of people turning to chiropractic, and the reasons that may prompt them to do so.

Social statistics describe the scope of the Age Wave - Seventy eight million people were born in the US between 1946 and 1964. In the second half of life, this group of people may be turning from the "science as proof" context to invisible, intangible components of existence. The business world in general, and the medical profession in particular, is paying attention to this trend. Marketers wishing to promote a product and/or service to patients are moving from telling the patient, toward a collaborative, experiential model. Allopathic physicians are being advised to "ride the Age wave" by embracing this group's worldview, and to focus on balance, harmony, and self-empowerment; to encourage active participation by the patients; and to respect the significantly different approach they take.

The largest section of the population is seeking "something new" in health care, and doing it in a very large way. This is demonstrated in studies and reports from the health arena, as well as reports of attitudinal shifts regarding traditional medicine. The data are supporting the prediction and framing the culture trend: Age Wavers are turning to something other than the usual and the traditional for their health, and for reasons other than the expected and anticipated physical problems.

Chiropractic care contains elements that fit perfectly with the emerging needs of the Age Wave, and chiropractors are uniquely positioned to be a source of the health care this group will want and need. Chiropractors can use the available evidence-based data for a foundation of patient education, but it may be the other factors that will be the ones to impact future patients. These factors include concepts of innate intelligence, self-empowerment and how that effects health, relational modes of healing, and even "wellness," if one defines wellness as a holistic combination of mind, body and spirit, all functioning at optimal levels. Chiropractors and chiropractic educators could consider the image or "brand" they are projecting and evaluate it for the approaching marketplace. If the members of the Age Wave will ask questions and search for health care that produces state-of-mind benefits, human connection, a more solid sense of self, and ultimately, a way to stay actively involved in one's own good health, then chiropractors should produce answers to those questions.

Reference: Lund C. *Chiropractic and culture trends - Philosophy and health for the age wave*. [Abstracts of ACC Conference Proceedings] J Chiropractic Education 2005; 19:21.

The Relationship between Religion, Spirituality and Health

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Spirituality has become a subject of interest in health care, and an increasing number of studies, commentaries and reviews examine the connection between religiosity/ spirituality and health, its potential to prevent, heal or cope with diseases. Moreover, research has confirmed that spiritual well-being is positively associated with quality of life, fighting-spirit, but also fatalism, yet negatively correlated with helplessness/hopelessness, anxious preoccupation, and cognitive avoidance. Indeed, there is evidence that spirituality is important in coping with illness, as spiritual well-being offers some protection against hopelessness and despair in terminally ill patients.

However, although religiosity and spirituality were interchangeable words, these constructs may not be identical. It is well established to divide Religiosity into three sub-constructs: Intrinsic, Extrinsic, and Quest Religiosity, while the construct Spirituality was divided into the following sub-constructs: Cognitive Orientation towards Spirituality, Experiential/Phenomenological Dimension of Spirituality, Existential Well-Being, Paranormal Beliefs, and Religiousness.

Furthermore, there is as yet but limited understanding of how patients themselves view the impact of spirituality on their health and well-being, and whether they are convinced that their illness may have "meaning" to them. To raise these questions and to more precisely survey the basic attitudes of patients with severe diseases towards spirituality/religiosity and their adjustment to their illness, we developed the SpREUK questionnaire.

In order to re-validate the previously described SpREUK instrument, reliability and factor analysis of the new inventory (Version 1.1) were performed according to the standard procedures. The test sample contained 257 subjects (53.3 ± 13.4 years) with cancer (51%), multiple sclerosis (24%), other chronic diseases (16%) and patients with acute diseases (7%).

Factor analysis of item pool 1 resulted in a 3-factor solution (i.e. the 6-item sub-scale 1: "Search for meaningful support"; the 6-item sub-scale 2: "Positive interpretation of disease"; and the 3-item sub-scale 3: "Trust in external guidance") which explains 53.8% of variance. Factor analysis of item pool 2 pointed to a 2-factor solution (i.e. the 10-item sub-scale 4: "Support in relations with the External life through Spirituality/Religiosity" and the 4-item sub-scale 5: "Support of the Internality through Spirituality/Religiosity") which explains 58.8% of variance. Generally, women had significantly higher SpREUK scores than male patients. Univariate variance analyses revealed significant associations between the sub-scales and Spirituality/Religiosity attitude and the educational level.

The current re-evaluation of the SpREUK 1.1 questionnaire indicates that it is a reliable, valid measure of distinct topics of Spirituality/Religiosity that may be especially useful of assessing the role of Spirituality/Religiosity in health related research. The instrument appears to be a good choice for assessing a patient's interest in spiritual concerns which is not biased for or against a particular religious commitment. Moreover it addresses the topic of "positive reinterpretation of disease" which seems to be of outstanding importance for patients with life-changing diseases.

Reference:

Büssing A, Ostermann T, Matthiessen PF. *Role of religion and spirituality in medical patients: Confirmatory results with the SpREUK questionnaire*. Health and Quality of Life Outcomes 2005, 3:10.

Effect of Chiropractic Care on Heart Rate Variability in a Multisite Clinical Study

The autonomic nervous system involuntarily controls the functions of the body systems. There are two branches of the ANS - the PNS and the SNS that work as antagonists. One target of the ANS is heart rate. HRV analysis has been used extensively as a measurement of fitness level, and recent studies now indicate that it may be a useful tool in detecting and following disease processes. HRV determines the balance between the PNS and the SNS using time and frequency domain measurements.

The purpose of this study was to investigate the effect of chiropractic care in a multi-clinic setting on balance of the PNS and SNS using the HRV analysis. It was hypothesised that chiropractic adjustment has a positive effect on the balance of the ANS activities thereby increasing HRV.

Chiropractors in private practice were provided with a HRV measuring device to perform analysis before and following chiropractic adjustment on 10 subjects. Eight subjects were monitored before and after a single chiropractic adjustment, and two additional patients were followed for a four-week period with two HRV recordings per week, in addition to the baseline recording. Information collected included: patient personal information, frequency of treatment, and disease history. Copies of patient information forms, a pain diagram, and a visual analogue scale (VAS) questionnaire were completed before and after each chiropractic adjustment. One hundred and seventy five chiropractors were recruited across the USA.

Data from 96 doctors were divided into single-visit and 4-week groups.

After one chiropractic adjustment, pain was reduced significantly from 3.8 +/- 2.3 to 2.2 +/- 2.0 ($p < .001$). The mean heart rate was reduced 76.7 74.3 ($p < .01$), the high frequency component, the low frequency component and the total power were all statistically significantly increased.

After 4 weeks increases in total power, very low frequency and low frequency components all reached statistical significance

The authors conclude,

"The decreased heart rate as well as increases in total power from the HRV analysis indicates that chiropractic treatment is associated with a shift to a healthy autonomic nervous system balance."

Reference:

Zhang J, Dean D, Nosco D. *Effect of chiropractic care on heart rate variability and pain in a multisite clinical study*. [Abstracts of ACC Conference Proceedings] J Chiropractic Education 2005; 19:79. (Note; this paper was also submitted and accepted as a poster presentation at the WFC's 8th Biennial Congress in Sydney, 2005).

Systematic Reviews of CAM have Higher Quality of Reporting than Conventional Medicine Reviews

The objective of this study was to compare the quality of systematic reviews reported in English and in languages other than English, and to determine whether there are differences between conventional medicine (CM) and complementary and alternative medicine (CAM) reports.

The authors used the Oxman and Guyatt (OG) scale to assess the quality of reporting in 130 systematic reviews: 50 were language-restricted, 32 were language-inclusive but only English-language (EL) trials contained (inclusive-EL), and 48 were language-inclusive and included trials published in languages other than English (inclusive-LOE). Of the 130 reviews, 105 addressed CM interventions and 25 addressed CAM interventions.

Comparison of the systematic reviews showed that the quality of reporting and reporting characteristics are not affected by inclusion or exclusion of LOE; however, the quality of reporting of systematic reviews involving CAM interventions is higher than that of reviews focusing on CM interventions.

The authors conclude,

“Informal comparison of the OG scale with the data collected on quality assessments showed that the OG scale performs well overall but may not identify important differences in comprehensiveness of the search strategy and avoidance of bias in study selection. Further research is required to determine the best methods for assessing quality of systematic reviews and whether the effect of language restrictions is dependent on the type of intervention (CM or CAM).”

Reference:

Lawson ML, Pham B, Klassen TP, Moher D. *J Clin Epi. Systematic reviews involving complementary and alternative medicine interventions had higher quality of reporting than conventional medicine reviews.* Accepted 30 August 2004. Available online.

Quality-of-life Changes in a Disadvantaged, Underserved Chiropractic Patient Population

The health of homeless individuals is characterised by high rates of morbidity, mortality, and very poor quality of life, and has been the subject of an increasing number of studies. Despite the increasing interest in the health and quality of life of homeless populations, a Mantis literature search revealed no studies have been published assessing the impact of chiropractic care on the health and quality of life of homeless people.

The purpose of this descriptive case series report is to assess whether chiropractic care provided by student interns at an outreach shelter clinic helped to improve quality of life of patients from a women's shelter.

This study was reviewed and approved by the Institutional Review Board of the Life University College of Chiropractic. Case records from the Ellis Street Women's shelter were reviewed and 10 case records that contained pre-and post-intervention SF-36 scores were included. The patients in

the cases studied received care from chiropractic interns for a period of at least 4 weeks. The care included complete case histories, physical examinations, chiropractic evaluations, lifestyle and nutritional counselling, and a series of chiropractic adjustments. Pre- and post-intervention SF-36 scores were compared using paired two-tailed *t* tests with Microsoft Excel.

SF-36 mean scores of patients from the shelter increased in each of the scales and summary scores. Patients involved in this study experienced double-digit mean score improvements in four of the eight SF-36 scales as follows - Bodily pain (11); General health (15); Vitality (22) ($p=.02$); Role emotion (13).

The authors suggest that the results of this study must be interpreted with caution because of the small sample size. The gain of 22 points in vitality is unusually large and quite promising, representing a significant improvement. That being said the post-intervention score of 47 on this scale is still 14 points below the population norm of 61.1.

The authors conclude,

“It appears that chiropractic care holds promise and merits further investigation as one means of enhancing the quality of life in the homeless population studied in this case series.”

Reference:

Kirk R, Hoiriis K, Mirtschink S. *Quality-of-life changes in a disadvantaged, underserved chiropractic patient population - A retrospective case series report*. [Abstracts of ACC Conference Proceedings] J Chiropractic Education 2005; 19:19-20. (Note; this paper was also submitted and accepted as a poster

presentation at the WFC's 8th Biennial Congress in Sydney, 2005).

Improvement in Hearing after Chiropractic Care

The first chiropractic adjustment, given in 1895, reportedly cured deafness. Chiropractic care has repeatedly been associated with improved hearing in small case series. This study examined the effects of a single, initial chiropractic visit on hearing by documenting clinical changes of audiometry in patients after chiropractic care.

Fifteen patients (9 male, 6 female) with a mean age of 54.3 participated in this study. A Welch Allyn Audioscope 3 was used to screen frequencies of 500, 1000, 2000, and 4000 Hz at fixed decibel levels. Chiropractic care provided was based on clinical findings relevant to each patient. There

was no treatment protocol employed that was specific to hearing. Pre- and post-treatment audiometry scores were compared using Wilcoxon's signed rank test.

All patients are reported to have shown immediate improvement in audiometric screening tests within speech frequencies. In these patients, the average score improved after treatment and the difference was statistically significant ($p < .02$) on both sides.

The author concludes,

"Patients presenting to this practice frequently have a mild to moderate hearing loss, most notably in the right ear and to low-frequency tones. The grouping of the total number of tones recognized after a chiropractic adjustment or improvements were surprisingly evenly distributed between the frequencies in both ears. The clinical progress documented in this report suggests chiropractic care may benefit some forms of hearing loss."

Reference:

Di Duro JO. *Improvement in hearing after chiropractic care*. [Abstracts of ACC Conference Proceedings] J Chiropractic Education 2005; 19:6.

The Effect of Low Force Chiropractic Adjustments on Body Surface Electromagnetic Field

The objective of this study was to examine the effects of 4 weeks of low-force chiropractic adjustments on body surface electromagnetic fields (EMFs).

Thirty five chiropractic students were randomly assigned into control (17 subjects) and experimental groups (28 subjects). A triaxial fluxgate magnetometer was used for EMF detection. A Toftness low-force chiropractic adjustment was applied to the cervical, thoracic, lumbar, and sacral areas as determined by the practitioner. Heart rate variability analysis was recorded once a week to determine autonomic nervous system activity in both the control and experimental groups.

The EMF on the subjects' body surface decreased after chiropractic adjustment at the cervical, thoracic, lumbar, and sacral regions in all 6 visits during the 4-week treatment period. The EMF showed a downtrend over the 4-week period after the low-force adjustment. The same changes were not observed in the control group. The chiropractic adjustment group had a slight decrease in heart rate over the 4-week treatment period, and no significant change was observed in the control group. Heart rate variability analysis did not show consistent changes before and after the low-force adjustments during the treatment period.

The authors concluded,

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“Low-force chiropractic adjustment in the cervical and thoracic areas resulted in a consistent reduction of the body surface EMF after 4 weeks of active treatment. No statistically significant differences were found in the heart rate and heart rate variability in the 4-week study.”

Reference:

Zhang J, Snyder BJ. *The effect of low force chiropractic adjustments for 4 weeks on body surface electromagnetic field.* J Manipulative Physiol Ther 2005; 28:159-63.

Immune Status Changes, Coupled with Self-Perception of Health and Quality of Life, in Subjects Receiving Chiropractic Care

Pilot Study

The purpose of this study was to gain insight into the physiology and immunology dynamics that might contribute to self-perceptions of improved health and quality of life.

This pilot study was conducted at the New Zealand College of Chiropractic, in Auckland. The study followed novice chiropractic subjects over a period of 9 months. Other than presenting with biomechanical complaints the subjects represented a healthy population as determined by history, complete blood count, and immune status. During a 9 month period, subjects received chiropractic adjustments when indicated. A self-reported quality of life questionnaire was completed by each subject following the initial visit and at 3 and 9 months re-assessment periods. At the same intervals a complete blood count and immune panel were obtained.

The authors report that the subjects demonstrated significant reductions in all chiropractic indicators at 3 and 9 months as compared to baseline. Furthermore, a statistically significant positive change in the domain of life enjoyment occurred from 3 months to 9 months. Statistically significant negative correlation was also observed between motion palpation findings and CD56 count at baseline.

In discussing their findings the authors state that the positive changes in physical assessments suggest a steady physical improvement among the 11 subjects. Neither absolute values nor percentages for the CD markers varied significantly over the duration of the study. However, a negative correlation between motion palpation findings and CD56 and CD 56% suggest a stress-related link.

This pilot study has provided some preliminary information regarding chiropractic care and possible links to immune status and improved aspects of health and quality of life. Larger studies will be necessary, including ill and healthy populations, to investigate the parameters presented herein and others such as killer cell activity.

Reference:

Boone WR, Oswald P, Holt K, Beck R, Singh K, Ashton A. *Physical, physiological, and immune status changes, coupled with self-perceptions of health and quality of life, in subjects receiving chiropractic care. A pilot study.* [Abstracts of ACC Conference Proceedings] J Chiropractic Education 2005; 19:46. (Note; this paper was also submitted and accepted as a poster presentation at the WFC's 8th Biennial Congress in Sydney, 2005).

The Effect of Cervical Rotation on Autonomic Control of the Cardiovascular System

History shows that since the earliest days of chiropractic, changes in visceral function resulting from spinal adjustments have been described. There is however, no confirmed scientific explanation of the mechanism of action of an adjustment in relation to these observations. Of relevance to this topic is the observation, made via previous study, that cervical adjustments carried out in the supine position are associated with changes in cardiovascular function. However, the role of vestibular input into this process has also been implicated.

The aim of the present study was to examine the impact of changes in somato-sensory input from cervical structures on the regulation of cardiac function as measured by heart rate variability.

This study consisted of two stages. Firstly, the effect of cervical rotation was examined using longitudinal body rotation against a steady head to minimise the influence of vestibular input. Secondly, the effect of cervical adjustment in the absence of, as well as under controlled cervical rotation conditions, were investigated.

Using a pre- post-test design the effect of cervical rotation on the autonomic regulation of cardiac function was studied in 27 healthy young adult subjects.

Post-test heart rate variability values calculated in positions of cervical rotation were found to be significantly different ($p < .05$) from pre-test values. Combined neck and body rotation was found to increase the power of the high frequency component of the HRV power spectrum.

The authors conclude,

"Combined cervical and body rotation under a stable, neutrally positioned head activates a variety of neck mechanoreceptors while minimizing vestibular inputs. This stimulus has a consistent, acute

effect on the autonomic drive to the heart increasing the parasympathetic balance of activity. The results of this study support the proposition that somatosensory inputs from neck structures are capable of invoking a change in the autonomic balance of the heart.

Reference:

Evans B, Polus B. *The effect of cervical rotation on autonomic control of the cardiovascular system in the awake human.* (This paper was submitted and accepted for platform presentation at the WFC's 8th Biennial Congress in Sydney, 2005. See pages 207-8 of the Congress proceedings).