CASE REPORTS

CHIROPRACTIC MAINTENANCE CARE AND QUALITY OF LIFE OF A PATIENT PRESENTING WITH CHRONIC LOW BACK PAIN

Adrian B. Wenban, BApp Sc, Mmed Sc,[a] and Michelle K. Nielsen, DC[b]

ABSTRACT

Objective: To report on a 26-year-old female patient presenting with uncomplicated chronic low back pain who received chiropractic maintenance care using 2 quality of life outcome assessment instruments.

Outcome Measures: Short-form (SF-36) subscales, Quality of Well-Being Scale, Visual Analog Scale, and number of tender vertebral spinous processes.

Results: After 9 months of care the SF-36 subscale scores showed improvement. The SF-36, although low before care, approached normal on 3 subscales and exceeded normal population values on 5 subscales after 9 months. The SF-36 physical and mental composite scores improved from mean baseline scores of 23.4 and 25.3 to 43.7 and 62.8, respectively, after 9 months of care. The Quality of Well-Being Scale scores improved from a mean pre-intervention score of 1.1 to a post-intervention score of 8.2. The Visual Analog Scale scores improved from a mean pre-intervention score of 8 to a post-intervention score of 1.5. The mean number of chiropractic vertebral subluxations, detected via palpation of spinous process tenderness, went from a pre-care mean of 6.5 to a post-care mean of 4.

Conclusion: The patient appeared to experience improvement in quality of life while showing signs suggestive of improved spinal function. The relationship between indicators of vertebral subluxation and quality of life deserves further investigation using a research design that allows for exploration of possible causal relationships. (J Manipulative Physiol Ther 2005;28:136-142)

Key indexing terms: *Chiropractic; Quality of life; Manipulation, chiropractic; Preventative health services; Outcome assessment*

Increasingly, health care providers are being encouraged to adopt an evidence-based approach in delivering the services they provide. One recent study,[1] based on methodology that has been applied in assessing the extent to which different medical specialties are evidence-based,[2-6] suggests that chiropractic practice may be as evidence-based as those medical specialties that have been similarly examined to date. However, in reviewing the literature to assess the extent to which the practice of chiropractic is evidence-based, there is a lack of chiropractic-relevant clinical trials that have been conceptualized within a nontherapeutic framework.

Despite chiropractic having traditionally conceptualized health and illness in a different way than medicine, most chiropractic-related clinical trials have been grounded in a therapeutic/condition specific model. In recent years, concern has been expressed within the chiropractic community[7] that the profession's research is in many ways indistinguishable from biomedical research. Donahue[7] stated: "Chiropractic research methods are in danger of being principally driven by the disease model of mainstream medicine. Certainly, case reports and group studies are easier to conceptualize by examining chiropractic efficacy with named medical diseases, illnesses, and syndromes. While it is often useful to demonstrate our efficacy to the powers that be, perhaps we are largely playing in the wrong arena."

Even patient-centered outcome measures, such as the Sickness Impact Profile and Neck Disability Index, often focus on the illness end of the health continuum. By assessing pain and disability they end up primarily capturing the absence of symptoms, rather than measuring positive states of health.[8]

Historically, once the patient reaches an asymptomatic state, chiropractors have advised patients to continue with

[a] Associate Governor, Australian Spinal Research Foundation.
[b] Private practice.
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Submit requests for reprints to: Adrian B. Wenban, BApp Sc, Mmed Sc, C/O Pelai 11, 4E, 08001 Barcelona, Spain (e-mail: *adrianwenban@wanadoo.es*).
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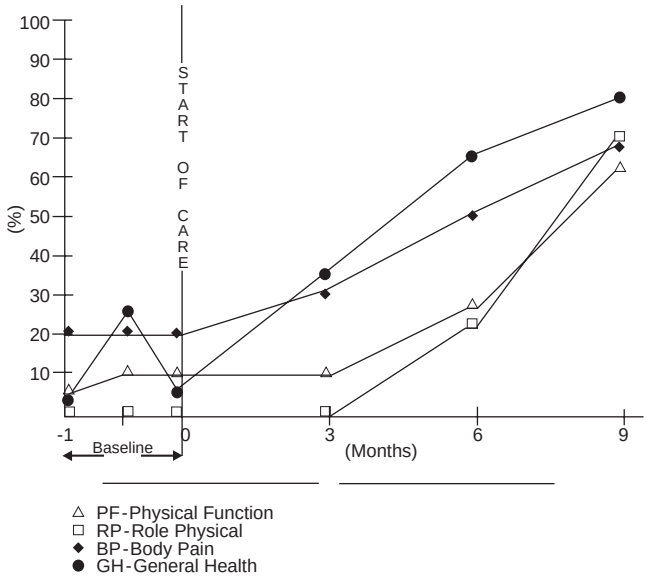

Fig 1. *SF-36 physical subscale scores vs time (months).*

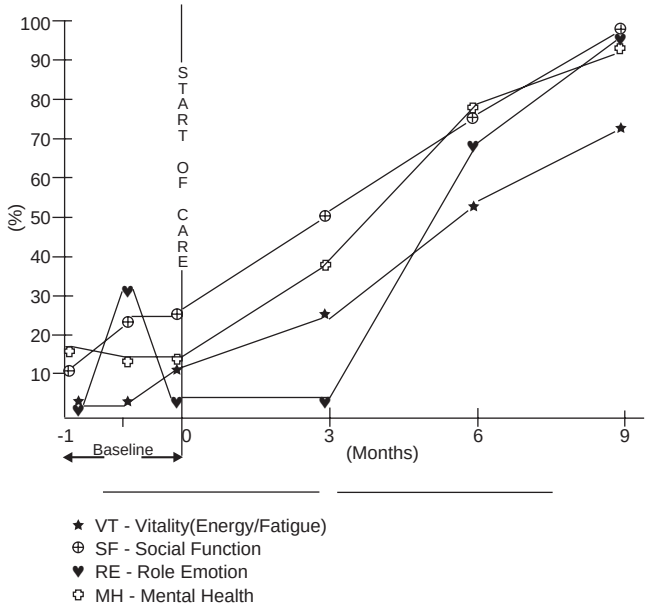

Fig 2. *SF-36 mental subscale scores vs time (months).*

Table 1. *SF-36 subscale scores before and during a chiropractic MC program*

SF-36 subscales		−4 wk	−2 wk	0	3 mo	6 mo	9 mo
△	PF	5	10	10	10	30	65
□	RP	0	0	0	0	25	75
◆	BP	22	22	22	31	52	74
●	GH	0	25	5	35	67	82
★	VT	5	5	15	25	50	75
⊕	SF	12.5	25	25	50	75	100
♥	RE	0	33.3	0	0	66.7	100
✪	MH	16	12	20	36	80	92

PF, Physical function; *RP*, role physical; *BP*, body pain; *GH*, general health; *VT*, vitality; *SF* social function; *RE*, role emotion; *MH*, mental health.

periodic office visits. This type of care is often called maintenance care (MC) for the purposes of prevention and health promotion. One component of the care rendered to patients during such MC programs is the chiropractic spinal adjustment. Several studies have sought to better delineate the role and use of MC within the chiropractic profession.[9-16]

During the early 1990s, Jamison asked, "Preventive chiropractic: what justification?" and after reviewing the literature concluded,[10] "Preventative chiropractic, as exemplified by prophylactic adjusting, lacks the scientific justification, as its current stage of validation, to be accepted as a positive contribution to health care." In 1996, 2 authors carried out a review of the literature relating to MC and attempted to describe the rationale behind it. They concluded,[11] "There is no scientific evidence to support the claim that maintenance care improves health status." Furthermore, they stated,[11] "Overall, there is a tremendous need to research the hypothesis that regular maintenance chiropractic care (spinal manipulation) will improve an individual's health status."

There seems to be consensus among chiropractors that more research into MC is required. One descriptive study[12] found that 93% of 658 US chiropractors and 97% of 138 Australian chiropractors agreed that MC requires further research. Furthermore, a pair of authors recently stated,[13] "It is essential that the chiropractic profession evaluate the efficacy of its prevention and wellness efforts. . .."

Chiropractors strongly agree on the composition of the care they deliver as part of MC. In one survey,[13] chiropractors placed virtually equal weight on exercise (96%) and adjustments (97%). Chiropractors agreed or strongly agreed that the purpose of MC is to optimize health (90%), prevent conditions from developing (88%), provide palliative care (86%), and minimize recurrence or exacerbations (95%). One survey found the average number of recommended MC visits to be 14.4 per year.[12]

Since Aker and Martel[11] published their review in 1996, and concluded that there is no evidence for MC, a number of preliminary studies[17-21] of varied scientific rigor have attempted to explore ongoing chiropractic care and its

Table 2. *SF-36 composite scale scores before and during a chiropractic MC program*

SF-36 component summaries		−4 wk	−2 wk	0	3 mo	6 mo	9 mo
⊙	PCS	22.1	24.8	23.2	26.3	30.3	43.7
⬠	MCS	22.3	28.1	25.5	33.3	55.7	62.8

MCS, mental component summary; *PCS*, physical component summary.

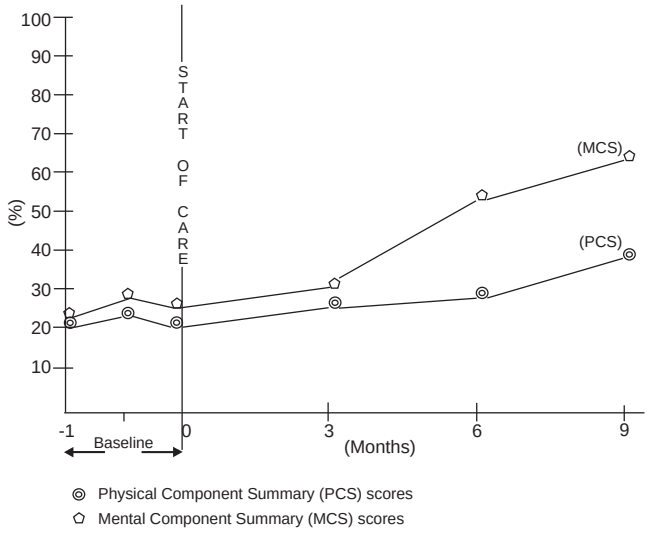

Fig 3. *SF-36 physical and mental component summary scores vs time (months).*

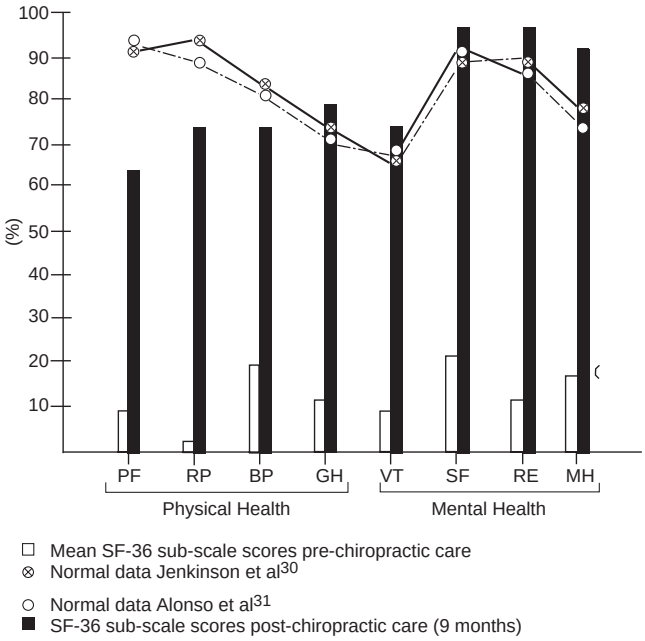

Fig 4. *SF-36 subscale scores: before and after chiropractic care vs population-based norms.*

association with improved quality of life and generalized well-being. One study[17] described several improvements in elderly patients associated with increased years of chiropractic MC. They included improved perception of overall health status, improved health habits, and improved mental status. However, the design of that study, a retrospective survey, did not control for a multitude of factors, other than chiropractic adjustments, that may have been in part or fully responsible for the observed improvements. Only one of those studies was of an experimental design.[20] It involved an analysis of data collected during a 3-year randomized controlled trial of citizens older than 75 years that related to a small subgroup of participants (n = 23) who had received ongoing chiropractic care. The analysis revealed that the chiropractic patients reported better overall health, better quality of life, had fewer chronic diseases, used fewer prescription drugs, and spent fewer days in nursing homes and hospitals than matched elderly nonchiropractic patients. However, because the chiropractic patients represented a self-selected group, the authors warned that,[20] "no causality can be implied from these results."

Furthermore, a recent survey,[13] which found that 79% of chiropractic patients have MC recommended to them and that nearly half of those (34%) comply, suggests that the recommendation for patients to take up MC appears to be widespread within the chiropractic community. As was previously mentioned, there also seems to be widespread consensus among chiropractic researchers[12,14] that more research into MC should be a priority.

Therefore, the chiropractic profession, although surrounded by an increasingly evidence-based health care environment, is confronted with the challenge of conceptualizing the chiropractic clinical encounter within a nontherapeutic framework and measuring changes in positive dimensions of health to better explore some of the profession's long-held beliefs regarding what works.

In light of the above factors we decided to conduct a prospective time-series case study wherein we describe 1 patient's pre- and post-care quality of life, as measured with 2 different quality of life instruments, while monitoring a vertebral subluxation indicator.

Methods

In choosing a subject for this prospective case study we applied the following criteria: older than 18 years, willing to delay the start of care by 4 weeks from time of initial presentation, must complete 2 scales and 1 questionnaire on 6 different occasions, keep appointments for an ongoing MC program, pay regular fees for all care provided, English speaking, and completes a written informed consent form.

The following exclusion criteria were applied: patient under chiropractic care in the last 6 months, inability to commit to a program of care (2 times per week for 6 weeks,

Table 3. *SF-36 subscale scores before/after chiropractic care compared with normal data*

SF-36 subscales	Before care (mean)	Normal data (Jenkinson et al)	Normal Data (Alonso et al)	After care (9 mo)
PF	8.3	92.5	95.3	65
RP	0	91.4	89.3	75
BP	22	86.3	84.1	74
GH	11.6	78.8	76.4	82
VT	8.3	64	70.0	75
SF	20.8	91.3	93.1	100
RE	11.1	85.6	90.7	100
MH	16	75.4	74.4	92

1 time per week for 4 weeks, 1 time per 2 weeks for the remainder of the study period of 5.5 months), any contraindications to chiropractic spinal adjustments (eg, spinal instability, fractures, inflammatory joint disease, bone-weakening disease, anticoagulant therapy), pending litigation, and unable to be contacted by telephone.

Baseline information was collected across a 1-month precare period, and during the 9-month-long program of care, the latter 6 months of which was considered MC. On each visit the patient's vertebral spinous processes, S2 spinous process, and the superior aspect of the posterior superior iliac spines were palpated for tenderness.[22] When tenderness was elicited in the absence of more serious indicators, the spine or pelvis was deemed "subluxated" and subsequently adjusted using a combination of diversified and sacro-occipital techniques as described in detail elsewhere.[23,24] The chiropractor that provided the care had 10 years of clinical experience and was professionally trained at Western States Chiropractic College.

The patient was a 26-year-old white female who presented with a chief complaint of uncomplicated chronic (>3 months) low back pain. The patient had received no other treatment and had never received chiropractic care before.

Before enrolling in care, the participant gave informed consent in writing after information about the study and the risks associated with chiropractic care were provided in writing. She was informed of all benefits and potential side effects previously documented for chiropractic spinal adjustments. She was informed that she was free to withdraw at any time, and therefore had complete autonomy. It was emphasized to the participating chiropractor and staff members that the same degree of patient confidentiality applied to this patient as to the other patients under care at that office.

The patient's participation was to be discontinued immediately if any of the following occurred: development of exclusion criteria during the course of care, refusal to participate in scheduled appointments, failure or refusal to complete the self-administered questionnaire, or use of other chiropractic care.

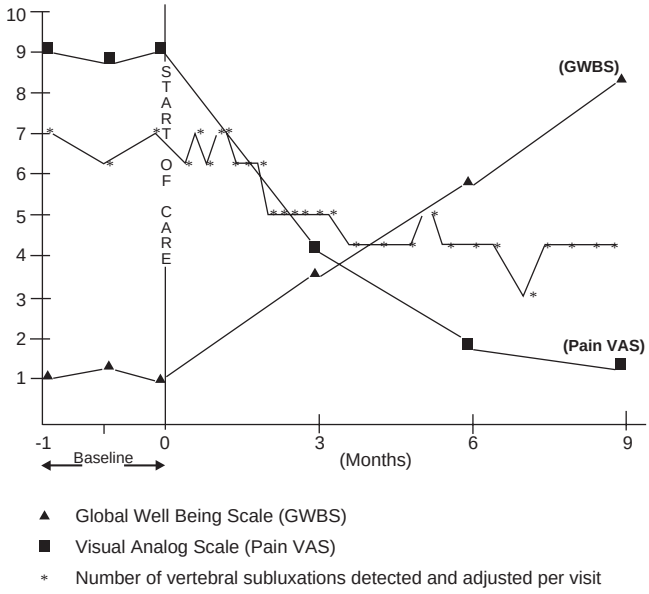

Fig 5. *Illustration of concurrent monitoring of 3 dependent variables in a single patient across 10 months (1 month of baseline and 9 months of intervention). Two of the measures (pain VAS and GWBS) are clinical outcomes while the other (number of subluxations adjusted/visit as detected via palpation for spinous tenderness) is a mediating variable.*

Although there is no consensus in the literature about a definition of quality of life, for the purposes of this case study the definition of quality of life, as outlined by Bowling,[25] was applied: "Quality of life is a concept representing individual responses to the physical, mental and social effects of illness on daily living which influences the extent to which personal satisfaction with life circumstances can be achieved. It encompasses more than adequate physical well-being, it includes perceptions of well-being, a basic level of satisfaction and a general sense of self-worth."

The quality of life battery included the Rand short-form (SF-36) self-administered questionnaire and the Quality of Well-Being Scale (QWBS); pain scores, as measured using a Visual Analog Scale (VAS), were recorded on the same 6 occasions.

The SF-36 was self-administered by the patient in the presence of chiropractic staff trained in the use of the instrument. The VAS was administered by a trained chiropractor other than the present authors and other than the chiropractor who rendered the care related to this study. The questionnaire and the 2 scales were included as part of the clinic visit procedure on 3 occasions before care and on 3 occasions during the course of care as follows:

- 4 weeks and then 2 weeks before initiating care;
- before initiating care on the first day of the program of care;
- after 12 weeks of intensive care;
- after 6 and 9 months of ongoing chiropractic care.

Table 4. *GWBS and VAS scores before and during a chiropractic MC program*

		Pre-care			During care		
	Outcome Measures	−4 wk	−2 wk	0	3 mo	6 mo	9 mo
▲	GWBS	1.0	1.3	1.1	3.7	5.9	8.2
■	VAS	9.2	8.8	9.0	4.2	2.1	1.6

The 2 scales and the questionnaire were designed for use in general populations and although both the SF-36 and the VAS have had their respective psychometric properties studied extensively, the QWBS has undergone only limited analysis. However, both quality of life instruments have been designed according to the recommended criteria for constructing indices to measure quality of life, and both were designed and have been used for the purposes of evaluating within-person change over time.[8,26,27]

Because the patient presented with pain as one of several chief complaints, a VAS was used to monitor change in pain intensity and to provide a point of reference and comparison for changes in quality of life across time. It is noted that pain scales provide only a small component of health outcomes, such scales correlate poorly with measures of physical function,[28] and focusing on impairment has only a limited use in assessing patient outcomes.

Hawk reported on the development, reliability, validity, and responsiveness of the Global Well-Being Scale (GWBS), a type of VAS. Reliability and validity testing of the GWBS indicates that it is reliable for test-retest use, construct validity related to emotional well-being and vitality, and is clinically responsive in the short term. However, responsiveness over the longer period has not been tested.[8] Initial results indicated its usefulness in assessing post-adjustment response in terms of general well-being.[27]

The SF-36 is widely acknowledged as the gold standard generic measure of health status. It is a generic measure of health status encompassing 8 dimensions and 2 summary scales of physical and mental health. The SF-36 is widely used and has been validated for use in a number of countries.[26] However, its clinical appropriateness, internal consistency reliability, validity, and responsiveness need to be further investigated across a broad range of chiropractic patients. In the present case study the response to each of the SF-36 questions was summed and transformed to give 8 scores between 0 and 100.

Recently, Hawk[29] published a preliminary report on the development of a practice-based research network to expand the scale of chiropractic practice–based research. The report, on 155 patients from 9 providers, yielded demographic information and pretreatment (SF-36) scores for comparison to the general population norms. Based on their scores on the SF-36, the chiropractic patients were generally lower on all subscales, but lowest for aspects of health most closely related to physical problems.

Results

After 9 months of care the patient's general quality of life showed improvement (Figs 1 and 2, Table 1). The SF-36 physical and mental component summary scores improved from mean baseline (pre-intervention) scores of 23.4 and 25.3 to 43.7 and 62.8, respectively, after 9 months of care (Table 2, Fig 3).

The mean baseline and post-intervention SF-36 subscale scores are presented and compared to 2 sets of population-based norms, 1 from the United Kingdom[30] and 1, that is age- and sex-matched to this patient, collected locally in Barcelona, Spain[31] (Fig 4, Table 3). The SF-36 profile of this patient, although low compared with that of the 2 normal populations data before care, approached normal on 3 subscales and exceeded both sets of normal population values on 5 subscales by the conclusion of the study.

The QWBS scores improved from a mean pre-intervention score of 1.1 to a post-intervention score of 8.2 (Fig 5, Table 4). The VAS scores improved from a mean pre-intervention score of 8 to a post-intervention score of 1.5 (Fig 5, Table 4). The mean number of vertebral subluxations, detected via palpation for spinous process tenderness, went from a pre-care mean of 6.5 to a post-care mean of 4 (Fig 5).

Discussion

This case represents an attempt to conceptualize and describe the ongoing chiropractic care of one patient from a broad, non–condition-specific, quality of life perspective. As opposed to describing the experiences of a sick person while under chiropractic care, this case study describes one patient's experience from a symptomatic state with poor quality of life to a nonsymptomatic state with a quality of life exceeding age-, sex-, and nationality-matched normative data on 5 of 8 SF-36 subscales. Furthermore, the patient's spinal function seems to have shown signs of improvement.

However, a number of limitations are inherent in this type of time-series case study. It needs to be noted that this case report, although prospective, documents the care

delivered to only one patient. Therefore, the reader must take precautions to avoid drawing conclusions that risk the inherent limitations of this report. It should be remembered that this type of study is "concerned with and designed only to describe the existing distribution of variables without regard to causal or other hypotheses."[32] In order for the present A/B time-series study, which is descriptive in nature, to take on the status of an experimental design, the case study would need to be extended to an A/B/A or A/B/A/B design. In this way, by repeatedly initiating and withdrawing the independent variable (ie, chiropractic spinal adjustment) while continuing to assess mediating variables (ie, subluxation indicators), and the dependent variable (ie, quality of life), it would strengthen the argument of a cause-effect relationship.

Because no withdrawal phase or subsequent follow-up period was included, we have no knowledge about the durability of the observed improvement in quality of life if the chiropractic care had ceased. It is possible that the patient's quality of life would have collapsed back down to baseline levels without chiropractic care. Alternatively, the gains in quality of life may have been sustained indefinitely even if chiropractic care was stopped after the 9 months of intervention. Again, to better understand the relationship between chiropractic MC and patient health, extended time-series case studies are recommended as one method by which we can better understand this relationship. It needs to be noted that the decision to pursue extended time-series studies, such as the A/B/A/B design, wherein care is withdrawn repeatedly, needs to be accompanied with the appropriate approval through an institutional review board or ethics review board.

A further limitation of this particular case study was that the baseline period during which quality of life, VAS scores, and information regarding subluxation indicators were collected was relatively short (4 weeks) compared with the length of the intervention phase of the study (9 months). The problem with having such a short baseline period is that long-term fluctuations in the natural history of an individual's quality of life may remain concealed. As one author[33] has recommended, taking at least 3 pre-intervention (baseline) measurements is required to make a tentative interpretation of level, trend, and variability. However, if our 3 baseline measurements are taken over too short a time frame we may know little more about longer-term fluctuations in the natural history of our mediating and dependent variables than if we only took one pre-intervention baseline measurement of each. As a result, the apparent improvement in quality of life seen across the course of this case study may have reflected long-term fluctuations in the natural history of this patient's quality of life as opposed to being caused by the chiropractic MC program.

Based on the comparison of baseline and post-intervention scores for the SF-36 questionnaire it is possible that ceiling effects may have been encountered. Ceiling effects occur when a questionnaire becomes unresponsive to change. Two of the SF-36 subscale scores (Social Function and Role Emotion) reached the maximum level possible, which may mean that some improvement in quality of life, may have gone undetected between the sixth and ninth months of care. Furthermore, in this particular patient, the SF-36 questionnaire did not appear to be as responsive to changes as was the QWBS early on in the present case study. As a result the SF-36 questionnaire and the QWBS might complement one another such that when used together they may allow a more responsive assessment of change across a broad range of health states than when used individually. It is recommended that the psychometric properties of the SF-36 questionnaire and QWBS receive further investigation among chiropractic patients in general, and chiropractic MC patients more specifically.

A further problem with interpreting changes in quality of life scores is that improved scores have been observed in patients participating in other studies who have been receiving placebo treatments and in patients in the run-in phase of studies before receiving either active or placebo interventions.[34]

It will be important to ask whether the improvements are a result of chiropractic spinal adjustments or some other aspect of MC, should further prospective studies show that there is an association between ongoing chiropractic MC, the resolution of subluxation indicators, and improved quality of life. For example, although an attempt was made to limit the independent variable of the chiropractic spinal adjustments, the patient was also exposed to a long-term chiropractor-patient relationship, educational material, reading matter, and an open plan environment. Any one of these, or other factors, may have contributed toward the observed changes in quality of life. Furthermore, the direction of the association cannot be assumed to be an improvement in quality of life following chiropractic MC. Although it may require extensive longitudinal studies to produce definitive answers to the nature of the relationship between quality of life, spinal function, and MC, some indication of the direction of the relationship might be obtained from cross-sectional studies comparing quality of life of chiropractic patients by length of time under chiropractic care.

We concur with the statement made by other authors[11] that, "Overall, there is a tremendous need to research the hypothesis that regular maintenance chiropractic care will improve an individual's health status." Furthermore, it is suggested that future attempts to research MC might best serve society's needs, while simultaneously reflecting the values ascribed to by practicing chiropractors, if such research is conceptualized within a non–condition-specific and quality of life model.

From a societal perspective, given that MC is recommended by many chiropractors, etching out an understanding of the experiences of large groups of relatively asymptomatic patients who are receiving ongoing chiropractic MC will be essential for appropriate resource allocation

decisions and for future rational priority setting by chiropractic, third-party payers, and governmental bodies.

Conclusion

This prospective case report describes one patient's experience while participating in a chiropractic MC program. Although no causal associations can be made, she appears to have experienced an improvement in quality of life, as measured by 2 different quality of life instruments, while simultaneously experiencing an improvement in spinal function. This topic deserves further investigation with a research design that would allow exploration of causal relationships.

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