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COMPARATIVE STUDY: HYDROTHERAPY

A pilot study of the comparative effectiveness of two water-based treatments for fibromyalgia syndrome: Watsu and Aix massage

Kieren Faull*

QE Health, P.O. Box 1342, Rotorua, New Zealand

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KEYWORDS
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Rehabilitation;
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Summary *Objective*: To evaluate the effectiveness on health outcomes of a proposed holistic therapy (Watsu, WATer shiatSU) as a possible intervention for people with fibromyalgia syndrome (FMS) by comparing its effectiveness with the present water-based therapy, Aix massage.

Methods: Thirteen females diagnosed with FMS completed Watsu and Aix treatments. Short-Form-36 General Health Survey (SF-36) data were collected at the start and completion of treatment in a two-condition, within-subject, reverse-order counterbalanced design. Each SF-36 subscale was tested with a two-way, repeated measure analysis of variance.

Results: Significant change in treatment and interaction effects were found for Watsu on the SF-36 subscales of physical function, bodily pain, vitality and social function, but not for Aix treatment.

Conclusions: Watsu was supported as an effective holistic intervention compared to Aix massage. Variables other than Watsu may have caused the significant result. A study with a larger sample and a control group is required before it can be inferred that the change is due to this therapy.

Introduction

This study aimed to compare the effectiveness of the existing water-based therapy, Aix massage, with Watsu (WATer shiatSU) for people with fibromyalgia syndrome (FMS) (see Figs. 1 and 2).

The aetiology of FMS is unclear, but it is characterized by chronic, diffuse musculoskeletal pain, fatigue, bilateral tender points and disturbed sleep (Adams and Sim, 1998; Wolfe, 1997). Treatment success has been limited within the approach that regards FMS as a disease with treatments focused on reducing pain by pharmaceutical and

*Corresponding author. Tel.: +64 7348 0189x877; fax: +64 7343 1660.
E-mail address: research@qehealth.co.nz.

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Figure 1 Aix massage.

Figure 2 Watsu.

physiological interventions (Wolfe, 1997; Carette, 1995). It appears that there are possibly more than physiological factors causing FMS and there is a need to concurrently use educational and psychological interventions (Carette, 1995; Reilly, 1999). However, such intervention, the biopsychosocial approach, which includes cognitive reappraisal of health goals, perceptions of disability, life roles and pain management has also had limited success (Nielson et al., 1992; Reilly, 1999; Davis, 1989; Schmidt, 1991). A third perspective is to view the individual holistically, as a unique component of a wider physical, social and spiritual system. Consequently, for the individual to remain healthy within the dynamic, ever-changing system of life, it is required that the individual possess a unique and resilient self-identity. Research supports the need for people with FMS to develop a resilient identity. Those with FMS tend to (a) have low self-esteem (Bernard et al., 2000; Burckhart et al., 1994), (b) exhibit behaviours of catastrophizing and depression (Bennett et al., 1996; Okifuji et al., 2000) and (c) exhibit irrational thinking (Parker et al., 1989; Smith et al., 1986), suggesting a less than resilient identity.

For those with FMS, biopsychosocial interventions have been reasonably extensively investigated and appear to possess a degree of sustainable success (e.g. Carette, 1995; Kashikar-Zuck et al., 2000; Schuessler and Konermann, 1993; White et al., 2001). In contrast, holistic medicine, defined as the art and science of healing the body, mind and spirit (Graham-Pole, 2001), has often been discussed but not investigated.

Complementary and alternative medicine (CAM) is the accepted expression for any treatment or therapy that is not commonly a part of mainstream practice (Graham-Pole, 2001). CAM therapies, such as acupuncture and various types of massage, are frequently included as components of multidisciplinary interventions but with the intention to address mainly physical dysfunction.

Holistic treatments propose that a dominant determinant of illness is the individual's loss of perception and experience of wholeness (Fitzgerald, 1997). The state of the spiritual component of self is cited as the critical factor determining the overall health status of the individual (Baldacchino, 2001; De Rozario, 1997; Matthews, 2000). Consequently, from a holistic perspective, while treatments need to impact on the physiological, social and cognitive states of the individual, it is considered that any sustainable changes in these aspects occur indirectly because of changes in the spiritual state of the individual. Interventions focus on self-awareness that facilitates exploration of relationships of self-to-self, self-to-others and self-to-world. Experiencing and understanding how the body and brain are connected and can work for or against each other and, similarly, developing an understanding of the relationships and connections of self-to-others and the world culminate in the growth of the core of self, that is, the spiritual core (Faull et al., 2004; Hamilton and Jackson, 1998).

Within a biopsychosocial philosophy, used by QE Health, the site for the present study, CAM therapies commonly focus on physical gains and do not address the spiritual component of health. The restricted aims of CAM interventions within a biopsychosocial multidisciplinary treatment model require that the CAM therapy is one of a number of interventions used to achieve change in overall health. Consequently, one would expect that

evaluation of the QE Health's present CAM intervention for FMS, Aix massage, would contribute to the overall effect of multidisciplinary intervention on health but not, by itself, have a large effect on health. In contrast, the holistic philosophy argues that holistic health interventions must address the person as a whole (Kissman and Maurer, 2002). Therefore, any intervention claiming to be a holistic therapy should, by definition, result in large health change. Watsu claims to be such a stand-alone holistic intervention. Consequently, one would expect that Watsu would have a large effect on overall health, without inclusion of other treatments.

Aix massage has been an accepted part of rehabilitation interventions at QE Health, Rotorua for people with FMS for the past decade. Aix massage is a full body massage under jets of warm water (35°–39 °C) aimed to reduce muscular spasms and tension, increase immune efficiency, circulation and tissue healing. Consequent psychological benefits of Aix are purported to be reduction of stress and possible increase in self-esteem (Fritz, 1995).

Watsu claims to provide gains in physical, psychological, social and spiritual health. Watsu was developed in Northern California, during the early 1980s. Harold Dull (1997), a Shiatsu practitioner, began to float people in warm water sourced from hot springs (35 °C), while applying the moves and stretches of Zen Shiatsu. Dull believes that warm water is the ideal medium to provide integrative therapy that frees not only the body but also the mind and spirit.

Subsequently, other therapists (e.g. osteopaths, physiotherapists, massage therapists, movement and dance therapists) have trained in Watsu and contributed their understanding, skills and emphasis to the work. Watsu has developed into a gentle form of body therapy combining elements of massage, joint mobilization, shiatsu, muscle stretching and dance.

Yavelow (1999) states that, 'Once your body is free and your mind is at peace, there is nothing left to keep your spirit from shining through' (p.2). Immersion and movement in water, which is a component of all living matter, is reasoned to be a major catalyst for such experience and exploration. Moreover, the resistance, buoyancy and warmth provided by water are used to increase mobility and flexibility. Likewise, the rhythmic movement through the water with accompanying bodywork is believed to facilitate relaxation, decrease pain, address abnormal muscle tone, ease muscle spasms, as well as encourage deep breathing and relaxation (Dull, 1997; Kauder, 1999; Vargus, 1998).

FMS is a disability in which people have physical, social, cognitive and, arguably, spiritual loss of well-being. It is a disability that should benefit from a holistic approach. In contrast, Aix massage, while sharing some similarities with Watsu, including the use of warm mineral hot spring water, focuses on the physical component of health. As FMS is a syndrome with no definitive evidence of singular physical causation, it is hypothesized that: Watsu treatment would have a significant, large positive effect on health status for those with FMS, while Aix Massage would have little effect on the same sample.

Method

Participants

Seventeen participants, recruited through advertisements placed with Arthritis New Zealand Educators and FMS support groups and meeting the study criteria of being over 18 years old, diagnosed by a rheumatologist with FMS and having no open wounds, began the study. Thirteen completed the study. All were female with ages ranging from 26 to 65 years and a mean of 46.3 ($SD = 12.27$) years. They resided in the Bay of Plenty, East Coast, Hawkes Bay, Taranaki and Auckland regions of New Zealand. Average length of time with FMS was 4.3 years ($SD = 1.3$), all participants had received secondary school level qualifications and three had university qualifications. Main occupations were predominantly home and/or childcare, but four participants were employed as professionals in various fields. One had participated in a 3-week inpatient rehabilitation programme at QE Health, which included Aix massage, but had not previously met either of the two therapists or the researcher involved in the study. The other participants had no previous association with QE Health or the study treatments.

Design

The design was two-condition, repeated measure with reverse-order counterbalancing. Counterbalancing was included to control order effects. Sequence effects were not considered problematic. Each treatment block consisted of four sessions over 2 weeks, comprising of two sessions per week with a 2-day gap between sessions. The first treatment block was followed by 3 weeks of no

treatment before commencement of the second treatment block.

To address possible confounding variables of varying peer group interaction, support, and use of QE Health FMS and related health information, the researcher introduced all the participants to each other, provided a room for informal group meetings, familiarized all participants with the QE Health library and arranged free access to the library resources for all participants for the duration of the study.

The study was designed to test Watsu and Aix therapies for clinically significant effect and to assess the scientific worth of developing a full study of Watsu, which was however within the logistical and financial constraints of QE Health. Because the study only sought to examine possible effects of Watsu and Aix on the health of people with FMS, it was not necessary that the sample be representative of all people with FMS. Therefore, a large sample size was not required. Researcher scepticism concerning the claimed benefit of Watsu plus the need to identify a clinically significant, as opposed to simply statistically significant effect resulted in the study aiming to only identify large effects. Consequently, participants required .80 power, assuming a large effect size is a minimum of 10 participants per cell (Cohen, 1988).

Procedure

Participants were randomly assigned to receive either Watsu or Aix as their first treatment by placement in alternative treatments in the order that they were recruited. They then selected one of two possible starting dates and an appointment time that was convenient and available, which remained the same for each treatment. Of the 17 participants who began the study, nine received Watsu first and eight received Aix first. Four participants who received Aix as their first treatment either withdrew or were excluded before receiving their Watsu treatment. Two of this group who withdrew had unavoidable work commitments and a family emergency. Two were excluded because of the development of an open wound and diarrhoea.

The MOS Short Form-36 health questionnaire was administered at the start and completion of each treatment type of treatment. Demographic details of age, time with disability, main occupation and education level were collected at the completion of the study.

Treatments and therapists

Aix treatment: While lying on a massage table and appropriately draped, the individual is covered in a continuous stream of warm mineral water (35°–39 °C) from a series of shower jets. Massage includes circular motion of the hands, the edge of the hands gently tapping as well as the use of fingers, and it is aimed to ease any specific points of muscle tension. The therapist converses with the participant to facilitate trust and relaxation, assess appropriateness of massage intensity and identify any specific areas to work on or avoid. At the end of treatment, the participants showered, dressed and had the option of resting on a bed or chair before leaving. Sessions were for 30 min.

Watsu treatment: Prior to the participant changing into swimwear, the therapist asked questions about symptoms and provided the opportunity for the participant to discuss what she was feeling, had observed, etc. between sessions. The therapist and participant then entered the therapy pool containing warm mineral water (32–35 °C), identical in composition to that used in Aix massage. After the therapist has explained how the session starts and ends, the participant, supported by the therapist, lies on his/her back in the water and closes his/her eyes. Supported mainly by the forearms placed predominantly under the small of the back and/or the head, the therapist moves the participant through the water in flowing, rhythmical motions which includes intermittent gentle massage and stretching. No conversation takes place between the participant and therapist during therapy. The proximity between the participant and the therapist ranges from full arms length to close cradling. After a session of approximately 45 min, the therapist assists the participant to a seated position in the pool. The participants shower, dress, rest for 5–15 min and then leave.

Therapists

Both therapists were female and wore swimwear during sessions.

The Aix therapist was 27 years old, had practised AIX massage for 6 years and has an Introduction to Relaxation Massage qualification.

The Watsu therapist was 43 years old, has practised Watsu for 6 years and is a registered World Aquatic Bodywork Association Watsu Practitioner and Instructor. She was a qualified Hellerwork Practitioner, General Obstetric Nurse and Midwife with an undergraduate social science degree.

Measure

The Short-Form-36 General Health Survey (SF-36) was designed as a generic indicator of health status for use in population health surveys but has gained popularity as an outcome measure in clinical practice and research (McHorney et al., 1993). The SF-36 consists of 36 items comprising eight subscales, which are physical function, role physical (role limitations due to physical health problems), bodily pain, social functioning, general health perception, role emotional, vitality (energy level) and mental health (psychological stress and well-being).

The SF-36 has been extensively investigated for validity (McHorney et al., 1993, 1994; Brazier et al., 1992; Sullivan et al., 1995; Perneger et al., 1995). It has been found to be sensitive to change, although studies indicate that in the areas of psychological health it can be less sensitive on some subscales than alternative measures (Martin et al., 1997; Riddle and Straford, 1998). However, the correlation of the subscales with other measures has been found to be consistently high enough to consider the SF-36 an appropriate and valid measure of distinct components of the respondents' health in the context of studies testing for large, clinically significant health change. In this study, the eight subscales were used as indicators of dependent variables.

Analysis

The raw SF-36 data were transformed into standard scores by the formula recommended by the Medical Outcomes Trust (1992), which standardizes data and then converts these to percentage scores.

The transformed data were then entered into the SPSS Version 10 program (SPSS Inc., 1999) in four groups, that is, 'Watsu before', 'Watsu after', 'Aix before' and 'Aix after'. Each group contained total scores for all eight SF-36 subscales.

Two-way within-group analysis of variance (ANOVA) of each set of subscale scores was undertaken. Factors were treatment type (Watsu and Aix) and time (before and completion of treatment).

Results

ANOVA identified significant differences on four SF-36 subscales of physical function, bodily pain, vitality and social function. Table 1 and Figs. 3–6 identify that the significant score differences were attributable to the Watsu treatment, while there were no significant treatment effects attributable to Aix. The interaction between order or timing of treatment and treatment type was identified for

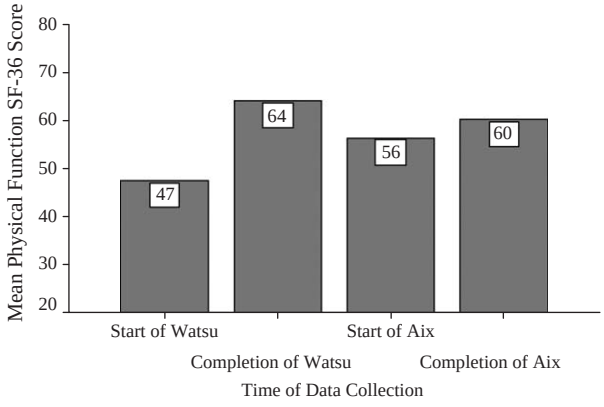

Figure 3 Comparison of treatment over time: physical function.

Table 1 Means and standard deviations of SF-36 subscale scores for treatments.

SF-36 subscale scores	Mean (and standard deviation) for groups			
	Start of Watsu ($n = 13$)	Completion of Watsu ($n = 13$)	Start of Aix ($n = 13$)	Completion of Aix ($n = 13$)
Physical function	47.308_a (21.274)	63.847_b (23.377)	56.154_a (19.701)	60.000_a (23.094)
Bodily pain	35.923_a (19.350)	$55.\ 077_b$ (14.186)	42.692_a (15.129)	42.308_a (13.979)
Vitality	31.154_a (16.975)	51.154_b (19.912)	38.077_a (20.365)	34.231_a (19.879)
Social function	53.846_a (21.881)	69.231_b (22.018)	75.000_a (17.678)	66.346_a (23.599)
Role physical	41.539_a (36.020)	61.692_a (31.047)	47.692_a (35.155)	41.539_a (27.642)
General health	47.692_a (23.859)	51.539_a (15.191)	49.231_a (19.023)	52.308_a (19.538)
Role emotional	63.462_a (33.253)	77.077_a (27.723)	65.385_a (37.553)	67.308_a (41.313)
Mental health	63.692_a (17.007)	74.000_a (22.891)	69.231_a (15.525)	71.385_a (15.987)

Different subscripts (i.e., a then b) between means at start and completion of treatments indicate a significant difference ($P < .05$) of SF-36 subscale score before and after treatment.

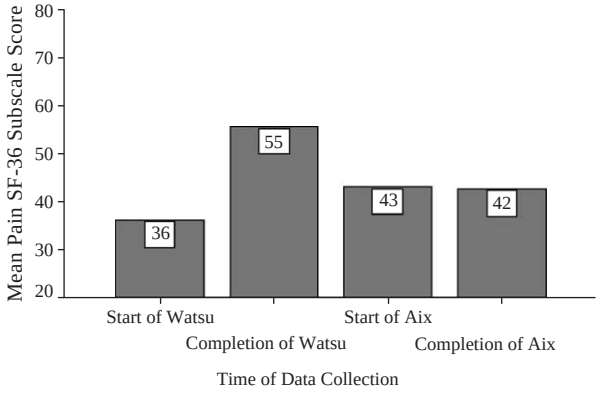

Figure 4 Comparison of treatment over time: bodily pain.

Figure 5 Comparison of treatment over time: vitality.

Figure 6 Comparison of treatment over time: social function.

physical function, bodily pain, vitality and social function was attributable to the effect of Watsu treatment (see Tables 1–5).

Figs. 3–6 illustrate that, across all four of these subscales, the 'start of Watsu' measurement (comprising those that received Watsu first and Watsu after Aix) resulted in a consistently lower mean score than the measurement taken at the start of Aix. The differences of mean scores at the start of Watsu, compared to those at start of Aix, illustrate the significant effect of Watsu in interaction with treatment order. Participants receiving Watsu first carried higher SF-36 scores into their second treatment, while those with Aix as their first treatment did not do likewise. The completion of treatment data reflects the interaction effect and highlights the large effect of Watsu on these subscale scores, indicating that health gains from Watsu treatment were sustained across the interval between treatments.

Cohen's convention for effect size ranks .40 as large and he comments that it is rare within the clinical context for the effect size to exceed .50 (Cohen, 1988). The effect size, eta-squared (η^2), or proportion of variance accounted for by the intervention of Watsu, compared to Aix, on the SF-36 subscales of vitality, bodily pain, physical function and social function was statistically and clinically significant (refer to Tables 2–5).

Discussion

The four SF-36 subscales of physical function, bodily pain, vitality and social function altered drastically because of Watsu treatment. Two other subscales results for Watsu were close to significant, mental health ($F(1,12) = 4.252$, $P<.062$) and role emotional ($F(1,12) = 4.585$, $P<.053$). In contrast, there was no significant change on any of the subscales for Aix massage.

Overall, the results supported the hypothesized effectiveness of Watsu and the predicted lack of efficacy of Aix massage when isolated from other treatments in the rehabilitation programme. Watsu, as practiced within the study, was found to be a highly effective intervention within this FMS sample.

4.1. Limitations

While the results suggest that Watsu is potentially a highly effective intervention for FMS, a study with a larger number of participants, incorporating a control arm, would identify if these findings apply to a more representative sample of people with FMS. Moreover, any confounding variables that may have caused the large effect sizes could be identified. With a control group design, it would be possible to investigate and measure the effect of treatment and therapist interaction, sample and environmental factors. There also remains the

Table 2 Two-way repeated measures ANOVA of SF-36 physical function subscale scores.

Source	Sum of squares	d.f.	Mean square	*F*	η^2	*P*
Treatment type						
Watsu vs. Aix	1350.48	1	1350.48	9.04	.43	.01
Error	1793.27	12	149.44			
Time	81.25	1	81.25	.48	.04	.50
Before vs. after treatment						
Error	2012.50	12	167.71			
Interaction	523.56	1	523.56	6.12	.34	.03
Treatment × time						
Error	1020.19	12	85.02			

Table 3 Two-way repeated measures ANOVA of SF-36 bodily pain subscale scores.

Source	Sum of squares	d.f.	Mean square	*F*	η^2	*P*
Treatment type						
Watsu vs. Aix	1144.92	1	1144.92	15.01	.56	.01
Error	915.58	12	76.30			
Time	117.00	1	117.00	.52	.04	.48
Before vs. after treatment						
Error	2690.50	12	224.21			
Interaction	1240.69	1	1240.69	6.51	.35	.03
Treatment × time						
Error	2285.81	12	190.46			

Table 4 Two-way repeated measures ANOVA of SF-36 vitality subscale scores.

Source	Sum of squares	d.f.	Mean square	*F*	η^2	*P*
Treatment type						
Watsu vs Aix	1350.48	1	1350.48	9.04	.43	.01
Error	1793.27	12	149.44			
Time	81.25	1	81.25	.48	.04	.50
Before vs. after treatment						
Error	2012.50	12	167.71			
Interaction	523.56	1	523.56	6.16	.34	.03
Treatment × Time						
Error	1020.19	12	85.02			

Table 5 Two-way repeated measures ANOVA of SF-36 social function subscale scores.

Source	Sum of squares	d.f.	Mean square	*F*	η^2	*P*
Treatment type						
Watsu vs Aix	1084.74	1	1084.74	9.46	.44	.01
Error	1376.20	12	114.68			
Time	147.24	1	147.24	.48	.04	.50
Before vs. after treatment						
Error	3719.95	12	310.00			
Interaction	1878.01	1	1878.01	4.85	.29	.05
Treatment × time						
Error	4645.43	12	387.12			

question of whether or not order effects have compromised the counterbalance design. Four of the eight participants, who first received Aix, withdrew resulting in this group being half the size of that which first received Watsu.

It is possible that the actual technique of Watsu is only a part of the Watsu effect. Watsu training emphasizes therapist self-awareness and self-understanding. To qualify as a practitioner, individuals must demonstrate an ability to listen and respond on multiple levels with the recipient, which is termed 'being' as opposed to 'doing'. This major component of Watsu training may enable the Watsu therapist to develop so that they subconsciously combine elements of a number of roles traditionally carried out by different rehabilitation professionals.

Only further research, involving multiple therapists, different contexts, comparing Watsu with other treatments and using a control group design, will provide clarity with regard to the therapeutic efficacy of Watsu.

In conclusion, the results clearly indicate that Watsu has the potential to be an effective therapy that warrants further investigation.

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