Evaluating the Jing Method of Advanced Clinical Massage on Shoulder Pain in CrossFit participants

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A dissertation submitted in partial fulfilment of the requirements of Jing Advanced Massage Training for the Professional Diploma in Advanced Clinical Massage and Sports Massage

March 2024

Total word count: 4368

"I certify that this work has not been accepted in substance for any degree and is not concurrently being submitted for any degree other than that of the Diploma in Advanced Clinical Massage and Sports Massage being studied at Jing Advanced Massage Training. I also declare that this work is the result of my own investigations except where otherwise identified by references and that I have not plagiarised the work of others".

Ms S L Bonney-O'Connell: _____

Date:

ACKNOWLEDGEMENTS

Firstly, to my Dad, always; the best shoulder to cry on, baby sitter, sounding board and general assistant. Thanks for always being there.

Sheree and Gill, unexpected, beautiful friendships are the best. Thank you for your support, love and laughter. Would have, without doubt, given up if not for you two.

Thank you to everyone that makes Jing Advanced Massage Training what it is, their tireless efforts to bring the highest-level qualification to the massage industry and give us as practitioners a top level of understanding and ability, are second to none. You are inspiring.

I also need to thank the CrossFit community and the place I have the privilege to call mine, Cattle Dog CrossFit. Always and without doubt the 'best hour of my day'.

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ABBREVIATIONS AND MEANINGS

Abbreviations	Meanings
NSSP	Non-specific shoulder pain
HFMAST	Heart, Fascia, Muscles, Acupressure, Stretching, Teaching
DASH	Disabilities of the arm, shoulder and hand
TP	Trigger point
BSP	Biopsychosocial

ABSTRACT

Objective: Non-Specific Shoulder Pain is one of the most widespread musculoskeletal issues in exercising adults and more specifically within the CrossFit environment. The objective of this study is to evaluate the Jing Method™ of Advanced Clinical Massage Therapy on pain and symptoms in CrossFit athletes.

Method: Within subject design using a validated self-reporting questionnaire. 3 participants aged between 25-35 who take part in CrossFit training sessions 4 plus times per week and have NSSP with no other diagnosis.

Intervention: A course of 6 weekly 45-minute treatments using the Jing Method™ Shoulder Protocol with a 5-minute rehab exercise video to be followed 3 x per week between sessions.

Outcome Measures: Weeks 1-6 participants completed the Disability of Arm, Shoulder and Hand questionnaire establishing a baseline during this control phase. During the intervention phase weeks 7-12, participants continued to complete the DASH prior to each session to review the previous week, and then a final questionnaire was completed six weeks post the final treatment.

Results: Improvement in symptoms and a reduction in pain was recorded during the 6 weeks of intervention, across all subjects.

Conclusions: The results of this study suggest that regular Jing Method™ Advanced Clinical Massage protocol, is successful in reducing pain and symptoms in NSSP for CrossFit participants. Further research studies that are longer with a greater number of subjects and including a wider range of ages are required to corroborate these findings.

LITERATURE REVIEW

Introduction

Over 4 million people a year participate in CrossFit, with 25% of all reported injuries being in the shoulder girdle (Nicolay et al, 2022). The current allopathic treatments via the NHS or other standard pathways with guidelines suggesting painkillers, physiotherapy and active rest (Wynne-Jones et al 2021) are often insufficient at providing relief for Non-specific shoulder pain (NSSP) which is commonplace within the sport due to the repetitive nature, high intensity and the constant heavy loading overhead (Silva et al,2022). Therefore, this research study has set out to investigate other potential pathways of complementary health care, using soft tissue therapy under the Jing Method™, more specifically the Jing Method™ shoulder girdle pain protocol (Fairweather & Mari, 2015) and its effectiveness on the symptoms of NSSP in CrossFit participants.

The researcher utilised Google Scholar and Pub Med as the main sources of information to find out about the incidence of NSSP in the CrossFit population and whether massage treatments have been evaluated. Previous studies on NSSP carried out by Jing students were also checked. The information found showed that there are limited studies specifically looking at CrossFit and this research hoped to add to the body of knowledge on massage therapy as a treatment option for this population.

Studies consistently demonstrate that manual therapy interventions are effective at reducing pain in athletic populations with musculoskeletal conditions (Wei, 2023). The conclusion that the Jing Method™ ACMT is effective in reducing pain in adults with NSSP is echoed by Murdoch (2023) in his study of chronic shoulder pain, a reduction in symptoms were reported using this method. However, the relatively new popularity of CrossFit in the mainstream fitness business means there is currently little scientific evidence to prove or disprove the effectiveness of massage therapy on pain and injury related to this sport.

WHAT IS CROSSFIT?

Developed and founded by Greg Glassman and Lauren Jenai in 2000, CrossFit's specific modes of exercise include Power and Olympic lifting (i.e., squats, cleans, deadlifts, bench press, Clean & Jerk and Snatch), gymnastics (i.e., pull-ups, lunges, knees to elbows, handstand push-ups, push-ups, and sit-ups), and aerobic exercise/metabolic conditioning (i.e., swimming, running, and rowing; (Longe, 2012; Weisenthal et al., 2014) along with other functional movements, into a constantly varied, high intensity workout.' (Schultz et al, 2016).

It is estimated, that globally, there are more than 15,000 affiliated CrossFit gyms (Glassman, 2021). With sessions scalable to allow elite athletes, the deconditioned and everyone in between to participate in the same class, all working at their own ability. The aim of the sport is to 'forge a broad, general, and inclusive fitness' Mehrab et al. (2017).

Whilst popularity is continuing to rise, the sport is often questioned over the stress imposed on the body, due to the high intensity and repetitive nature of the movements involved. Summitt et al (2016) surmise that CrossFit poses 'an inherent risk of injury, specifically to the shoulder, due to the intensity of training'.

Figure 1 The Kipping Pull-Up (reproduced with permission from Mary McFazdean)

WHAT IS NON-SPECIFIC SHOUDER PAIN?

Non-specific shoulder pain (NSSP) is the most common disorder of the shoulder (Michener et al, 2003). It is defined as this when there is no discernible cause of the pain.

The shoulder girdle (glenohumeral, sternoclavicular, acromioclavicular and scapulothoracic joint) comprises many muscles, tendons, ligaments and several bones. The cause of shoulder pain is often difficult to discern due to the complex nature of this joint.

WHY IS NSSP PREVELENT IN CROSSFIT PARTICIPANTS?

CrossFit places a huge demand on the body in general and more specifically, constant, repetitive, dynamic, and heavy overhead movements.

There are studies to show that the 'rate of injury to the shoulder, elbow, and wrist in CrossFit is higher when compared to traditional weight-training and more comparable to elite-level gymnastics and Olympic-style lifting' (Nicolay et al, 2022). Lastra-Rodríguez et al (2014) conclude that, CrossFit participation exposes individuals to 'greater harm to the shoulder joint, more specifically the Scapulohumeral joint' compared to other sports.
With many injuries occurring from repetitive gymnastic movements, for example kipping pull ups (see Figure 1) and muscle ups, 'the shoulder was most commonly injured in gymnastic movements' (Weisenthal, 2022) and weightlifting with repetitive above the head loading, were pointed by participants as the main cause of shoulder pain' (de Souza, et al 2021). These movements, which play a huge role in a CrossFit training programme, combined with poor shoulder girdle mobility and stability, can lead to shoulder issues, NSSP being a common complaint among recreational CrossFit participants. With males more likely to sustain an injury than females. Also worth noting is the correlation between pain felt in the shoulder joint and total time spent training within the CrossFit environment; Vigar and Medina-Mirapeix (2019) conclude that 'The probability of suffering pain in the shoulder duplicates when > 1,000 hours of CrossFit are reached'.

Fig 2 The Snatch (reproduced with permission from Jamie Warr)

THE JING METHOD OF ADVANCED CLINICAL MASSAGE AND THE TREATMENT OF NSSP

When seeking care for NSSP individuals are offered ‘primary treatment options typically consisting of analgesics or exercises and progress to secondary and tertiary options of steroid injections or surgery if necessary’ Hawk et al (2017).

The Jing Method™ of Advanced clinical massage is a multi-modal approach to manual therapy, utilising a variety of advanced massage techniques, including myofascial work, trigger point therapy, acupressure and stretching, with a focus on building a therapeutic alliance with and educating the client, empowering them to play a positive role in their recovery.

The method also considers the influence of the Biopsychosocial model on pain and symptoms experienced by subjects (Figure 2). Acknowledging the relationship between the three elements and their combined effect on not only symptoms felt by individuals, but their subsequent response to treatment, adherence to rehabilitation work and overall recovery.

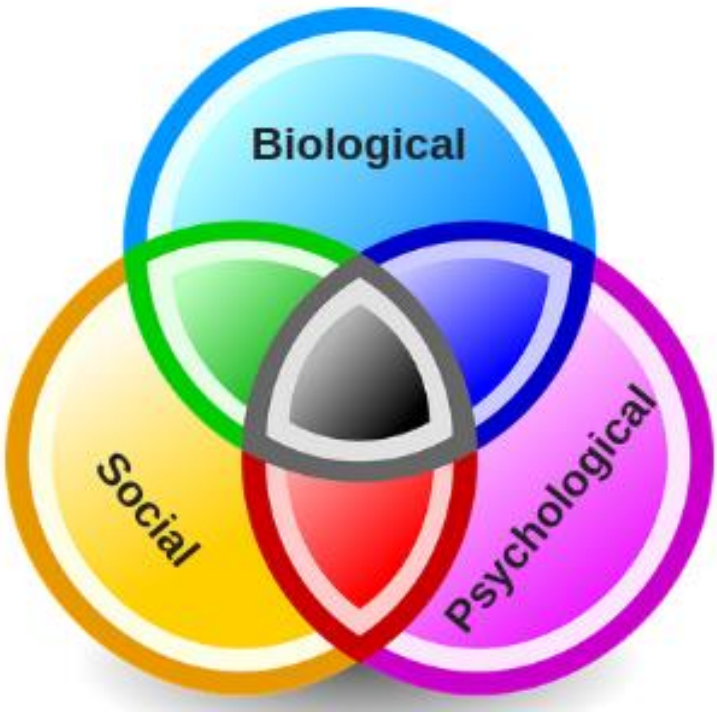

Figure 3 The Biopsychosocial (BPS) model

The BSP mode is summarised by Fairweather and Mari (2015) using the mnemonic HFMAST. Outlined below are the elements of this protocol.

Heat – the use of heat can, prior to treatment allow a sense of calm and relaxation for the client as well as triggering a response that includes "pain relief and increases in blood flow, metabolism, and elasticity of connective tissues. Malanga et al (2014)

Fascial Techniques – used prior to more traditional massage work and without the use of lubricants, 'myofascial release can free the structures producing pain and can also relieve the emotional pain associated with past unpleasant events or trauma.' Barnes (1995) using these techniques first allows deeper connection with the body and reduces adhesions held in the fascia.

Muscles – as early as 1816 British physician Balfour reported on 'nodular tumours' associated with local and regional muscle pain. With Travell and Simons (1983) and Shah (2015) also providing studies which demonstrate the effectiveness of trigger point (TP) work for musculoskeletal (MSK) pain. TP work is a sustained pressure approach that requires the therapist to locate 'knots' or 'hot spots' within taut, muscle and apply direct pressure for up to ten seconds. The therapists typically perform the application of pressure about three times.

Acupressure Points – integrating Eastern and Western medicine techniques. The Jing Method™ of advanced clinical massage uses Acupressure points as both an enhancement to treatments and as part of a self-care programme for clients. These are the same energy meridians and acupoints as those targeted by
acupuncture. It is believed that through these invisible channels flows vital energy -- or a life force called qi (ch'i). When one of these meridians is blocked, illness can occur. Working these points is thought to bring balance back to the body.

Stretching – The Jing Method™ advocates the benefits for the addition of multiple types of stretching: Static, Proprioceptive Neuromuscular Facilitation, Active Isolated Stretching and

Dynamic within the treatment setting and as part of the clients' self-care routine to accrue the most beneficial results.

Teaching – Educating individuals to follow a self-care practice between sessions and as part of an ongoing rehab programme empowers an active role in their recovery, moving away from being dependant solely on treatments and this 'education as part of a muti-disciplined approach' (Joypaul, 2019) can help individuals 'progress and effect the needed life modifications' (Rehan, 2010).

The 'teaching' element of HFMAST ties strongly with the development of a strong Therapeutic Alliance, another important component of the Jing Method™ ACMT.

As discussed by Ferreira et al (2013), developing a good therapeutic alliance with a subject can assist in reduction of pain and return to normal function and treatments where a deeper level of therapeutic alliance is built between client and therapist are associated with better health outcomes. This is corroborated by Taccolini et al (2018) who reported significant improvement in pain when 'therapeutic alliance incentive measures' were introduced in treatments.

Manual therapy has been shown to produce benefits at short-term follow-ups in various musculoskeletal disorders (Bialosky et al, 2017) and is thought to produce a neurophysiological response that activates the descending inhibitory pathways, leading to a reduction in the symptomatology of patients (Babatunde et al, 2017).

Studies into the effectiveness of The Jing Method™ have shown positive results. Harte (2023) concluded that it was 'effective in reducing the pain of individuals with NSSP' showing a reduction in pain from 4.76 to 3.62 over a six-treatment period. This reduction in pain was also shown as a result of a study by Gimeno (2023) using The Jing Method™ of clinical massage on rotator cuff pain in strength training adults who reported an overall reduction in pain of 25.66% up to and including four weeks after the final hands-on treatment. Chung 2018 surmised that The Jing Method™ was able to facilitate a 'meaningful reduction of pain', with a 20% decrease being observed.

With NSSP being a key cause of pain in CrossFit athletes, and various studies showing how massage therapy can help shoulder pain, this study aims to establish what effect The Jing Method™ of ACMT can add to this growing field of study and its potential as an addition to established treatment protocols.

METHOD

Ethical approval was received for this study from Jing Advanced Massage Therapy in 2023 (Appendix 1). The aim of the study is to provide clinical massage to adults who regularly participate in CrossFit and experience NSSP.

A group of 10 participants were initially recruited from local CrossFit gyms, using Facebook, Instagram and word of mouth. Four individuals did not meet the inclusion criteria, 6 participated in the control phase of the study. Just prior to start of the intervention stage 2 pulled out due to conflicting work commitments and 1 due to being hospitalised. Leaving a group of 3 (2 male, 1 female) aged 25-35, to complete the study.

At an initial consultation a full medical history was taken, and the participants agreed to abstain from any other therapies for the duration of the study. They were all participating in CrossFit sessions 4-6 times per week, had NSSP that had no specific trigger; trauma, injury, surgery, or other disease and had developed gradually over time.

This was a with-in group study with participants completing a DASH (Disabilities of the Arm, Shoulder and Hand) questionnaire (Institute for Work and Health, 2013) for 6 weeks prior to the commencement of hands-on treatment, to establish the level of difficulty experienced using the shoulder and arm during the control period.

The DASH questionnaire is a well-established measure of pain and mobility issues related to the upper extremity. It is an accurate measure of functional limitations and symptoms on an individual's ability to perform daily activities and tasks. Studies have shown that DASH demonstrates good validity in assessing physical function, symptoms and overall disability related to the arm, shoulder and hand. Kitis et al (2009) conclusions support the findings that 'DASH is a reliable and valid instrument to measure functional disability'. This is supported

by Atroshi et el (2009) who determine 'DASH is a reliable and valid instrument that can provide a standardized measure of patient-centered outcomes in upper-extremity musculoskeletal conditions' and a study by Bionka et al 2009 refer to the 'acceptable validity and responsiveness of the DASH' as a means of assessment.

Comprised of 30 questions that assess the subjects' ability to perform daily tasks. Each item has five options that are rated on a 1 to 5 Likert scale. The final score being a sum of all the items. (Appendix 2)

The participants were asked to complete the DASH questionnaire each Friday morning for 6 weeks during the control period (weeks 1-6) and then again, each Friday morning, prior to their treatment session, for the next consecutive 6 weeks of intervention (weeks 7-12), with a final 'follow up' questionnaire at week 16.

The 45-minute treatment sessions, that implemented the Jing Shoulder protocol (see Appendix 3), were carried out on the same day each week. The treatment sessions followed the Jing Method™ of HFMAST and more specifically the Shoulder girdle protocol, to target key muscles in the shoulder girdle including deltoids, pec minor, trapezius, supraspinatus, infraspinatus and others. Participants were given 'homework' exercises via demonstration during sessions 1 and 4 and a video via What's App to follow at home. This was a video of the exercises being demonstrated in real time, so the subjects were able to follow along at home. Each video had a demonstration and verbal description of the exercises, was approximately 5 mins in length, with 3 exercises prescribed for weeks 1-3 and 3 different ones for weeks 4-6 (Appendix 4)

The focus of this study was a combination of hands-on treatment, alongside rehabilitation 'homework' exercises. The study was formatted to encourage the subject's active involvement in their treatment and recovery.

RESULTS

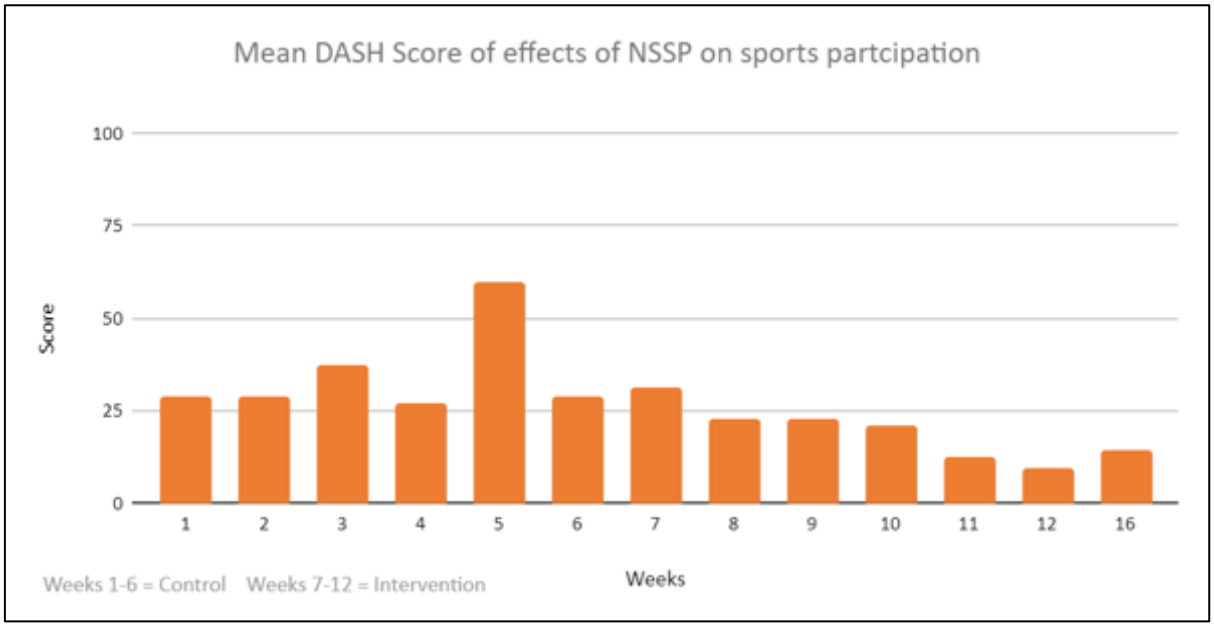

Figure 4 illustrates the groups mean DASH scores, specifically in relation to the effects of NSSP on sports participation during the study.

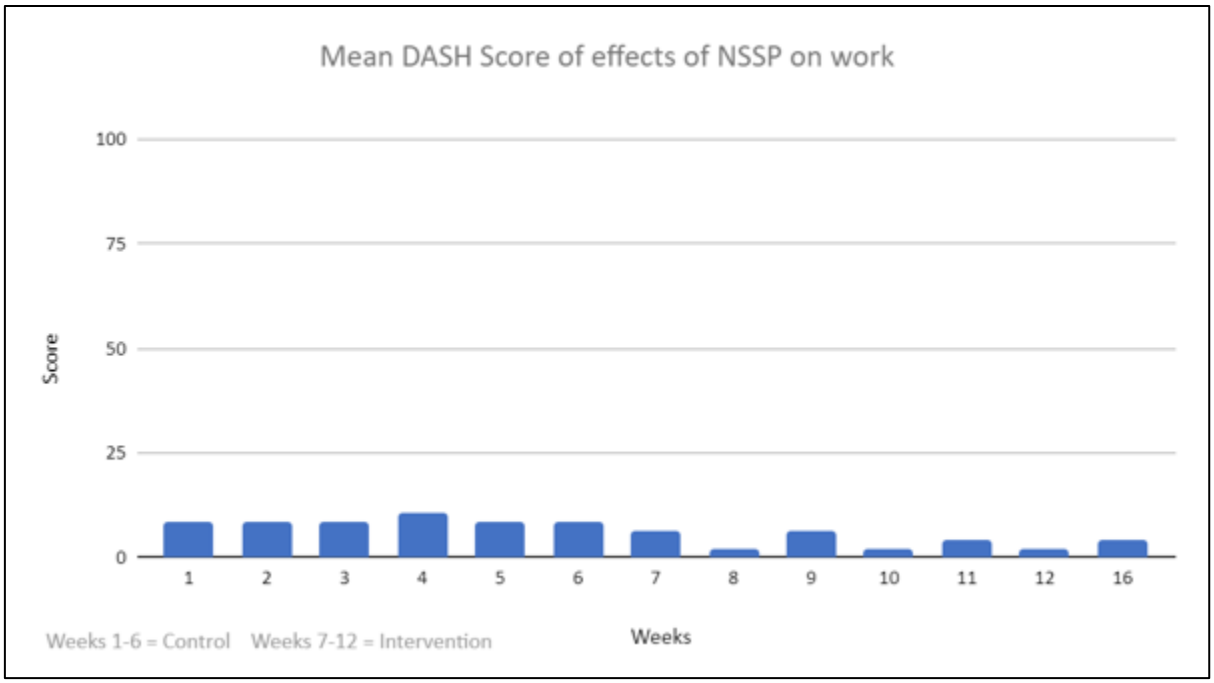

Figure 5 illustrates the groups mean DASH score, specifically in relation to effects of NSSP and ability to perform work relayed tasks during the study period.

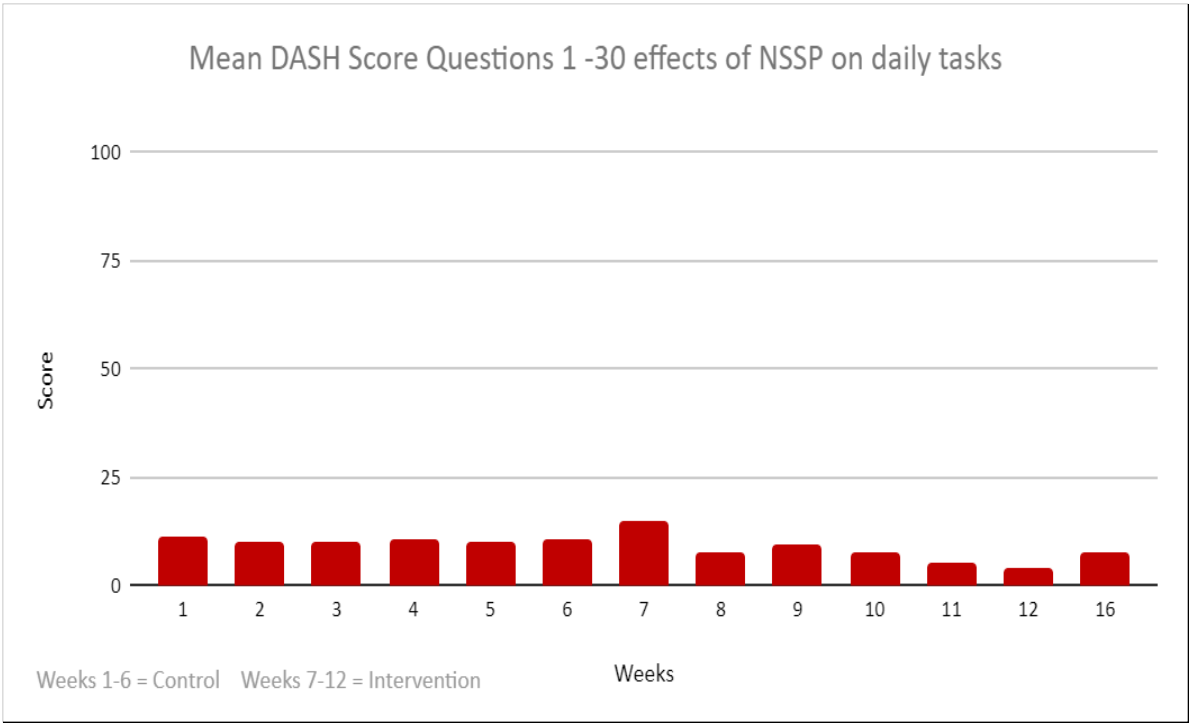

Figure 6 illustrates the group's overall mean DASH score, in relation to effects of NSSP and ability to perform daily life tasks during the study period.

N.B – weeks 13, 14 and 15 are not shown on the graph as no DASH was completed on these weeks of the study. Therefore, the increase shown between weeks 12 and 16 appears steeper than it would if DASH scores had been recorded on these weeks and plotted on the graph.

DISCUSSION

The focus of this study was CrossFit participation, illustrated in Figure 4 is a significant decrease in the DASH scores pertaining to Sports.

This study showed that there was an overall improvement in symptoms and pain associated with NSSP in CrossFit participants over the six-week intervention period of the Jing Method™ ACMT Shoulder Protocol. With a mean average overall reduction in score for daily tasks within the group by 3.6 units (11.3-7.7). This reduction was higher in the specific areas of

work 4.1 units (8.3-4.2) and sports 14.6 units (29.1-14.5). This indicates that the Jing Method™ ACMT shoulder protocol, using the HFMAST techniques, can provide a positive outcome for CrossFit athletes suffering from NSSP, without the need to miss training, competition, or other sports participation. The success in symptom reduction of this cohort supports the multimodal approach to intervention and subsequent hypothesis of Fairweather & Mari (2016) 'that the effect of the whole is greater than the sum of its parts'.

This finding is in line with similar studies. In 2003, Dolder and Roberts found that participants had a reduction in pain by 4.9 units (7.5-2.3) and improved functionality by 8.6 units (4.9 – 12.3) Two recent studies using the Jing Method™ ACMT shoulder protocol; Harte (2023) and Gimeno (2023) , whilst using a different instrument to measure symptoms, the SPADI (Shoulder Pain and Disability Index) questionnaire, both show an improvement in symptoms and reduction in the effects of shoulder pain on daily tasks.

Wei (2023) Van den Dolder and Roberts (2003) conclude that soft tissue treatment around the shoulder helped improve pain and function and this is backed up by a further study which states that findings show 'that massage therapy significantly reduced shoulder girdle pain in the short and long term' (Yeun 2017).

This current study undertook to and has corroborated these findings, showing a decline in symptoms for all subjects over the 6-week intervention period.

The most significant change in the data and the most relevant to the nature of this study, the sports questions within the DASH, showing a reduction in score of 14.6 units (29.1-14.5). This would indicate that whilst there is evidence to show (Summit et al, Silva et al 2022) the repetitive, high intensity nature of CrossFit is an inherent risk factor in creating NSSP in athletes, the combination of soft tissue treatment (more specifically the Jing Method™ ACMT Shoulder protocol) could be the key to reducing incidences of NSSP in these athletes. With over 25% of all injuries attributed to CrossFit participation being NSSP (Nicolay et al 2022) these positive results give a realistic alternative to medication or time off from training to assist with treatment, for what is a significant percentage of this population.

The anecdotal feedback reported on improvement in both physical and mental wellbeing, was overall positive in the group.

Developing a strong Therapeutic Alliance with clients is one of the most powerful tools a therapist has, as found in previous study 'developing a good therapeutic alliance with a subject can assist in reduction of pain (Ferreira et al 2013).

Subject 1 demonstrated this during the study: During the control phase subject 1 noted, alongside DASH responses, feelings both mental and emotional, communicated each week changes in posture and awareness of the effects desk-based work on the body in general, not restricted to the NSSP issue. This increase in awareness potentially contributed to the improvements 1 made over the period of the study. Ranasinghe et 2011 discuss that 'lack of awareness' among office workers contributed to complaints of neck and shoulder pain, so it is therefore possible that the reverse could have a positive effect. Overall, the mean DASH score for 1 reduced by 11.67 units from 12.5-0.83. A reduction in symptoms of 93.3%.

Subject 1 reported how she felt during the week between treatments and would check in each time homework exercises were completed. During weeks 5-7 subject 1 was at the end of a contact and potentially had no work forthcoming. During hands-on sessions was visibly worried about this and vocalised feeling the stress in the neck and shoulders at the start of treatment sessions. This is reflected in the scores for week 6 and 7; 15.8 units and 15 units, these being the highest score for 1 over the whole study, indicating that cognitive stress potentially plays a part in the level of felt physical pain. This is corroborated by findings from Waested et al (1996) that the 'trapezius muscle shows a clear motor response to cognitive stress' with a higher level of stress resulting in a higher level of muscle activity.

Subject 2 is a semi-professional Rugby player, competitive CrossFit athlete and Coach. Whilst 2 reported feeling improvement in symptoms after each hands-on session, weeks 8 and 10 participated in a rugby match the day following the session, which resulted in the immediate return of pain and restricted range movement. This would the twice weekly Rugby training sessions.

The weeks without rugby training or a match showed significantly different responses in DASH scores: a rugby match, twice weekly rugby training and 5 CrossFit sessions during week 8 -9 and his score increases from 5 units -14.6 units, an increase in felt symptoms of 46%. With a week resting from all training (weeks 9-10) a score reduction of 13.13 units is recorded (14.6- 0.83) a reduction in felt symptoms of 89.9%.

Trauma of the continual physical impact placed on the body during Rugby, the stress to both the soft tissues and the nervous system clearly contributes to the NSSP experienced by this subject. In discussion with subject 1 he reports that shoulder pain is always more prevalent during the rugby season, as opposed to the off season when he just participates in CrossFit. Partner et al (2022) found, in their study on shoulder dysfunction in uninjured ruby players, that '55% of rugby players can expect to have a shoulder dysfunction at the mid-point of the season'. There for we can surmise that Rugby is a significant contributing factor to the NSSP symptoms experienced by subject 2.

Subject 3 had a scores for week 7 and week 10 of 15 units and 15.8 units were the highest recorded for this subject throughout the study. These scores coincided with participation in CrossFit competitions. Given the intensity of workouts at competition level, this is not a surprising occurrence 'the shoulder joint is the most prone to injury during the practice of this sport'. (Szab et al 2022). The mean average spike seen at week seven is a combination of the same score of 15 for each of the 3 subjects. As previously discussed, subject 1 was experiencing increased stress levels at this point I the study, subject 2 recording a higher score over the weeks at the beginning of the study.

DASH scores for the group as a whole show an overall reduction from week 1 to week twelve of the study. This reduction is seen in all 3 of the areas covered by the questionnaire, daily tasks, work tasks and sports participation.

A follow up DASH was completed at week 16, four weeks after the last hands-on intervention. The overall mean score showed an increase of 3.6 units (4.1-7.7) but had not returned to pre intervention levels (week one of study scored 11.3).Similar finding can be seen between weeks

12-16, with the work related questions score increasing by 2.1 units (2.1-4.2) and the sports section showing an increase of 5.1 units (9.4-14.5)With the scores for week one recorded at 8.3 units for 'work' and 29.2 for 'sports' the results indicate that at four weeks after the last intervention the effects of the Jing Method™ ACMT Shoulder protocol are still benefitting this cohort, with scores significantly lower than pre-intervention records.

LIMITATIONS

Due to the nature of massage therapy, a blind trial cannot be undertaken. The low number of subjects participating in this in this study limits the amount of data that could be gathered and so restricts the scope and depth of research. The within-subject design meant that the participants acted as their own control group and were self-reporting via a link to the DASH questionnaire that was emailed to them to complete and submit, this worked well for all but one participant, who kept forgetting to fill during the control phase of the study, this led to the researcher supplying this subject with paper copies each week and whilst not ideal, ensured the information was collected at the correct time. DASH is a self-reporting questionnaire designed to assess the patient's health status during the previous week and whilst is a comprehensive set of questions in its full form, it still has limitations; it does not provide a 'particular score that represents a specific level of disability of mild moderate or severe or if subjects are able to work' ((Beaton et al 2001)

When recruiting participants, the variability of pathologies associated with NSSP was not considered.

There was a week between treatment and each DASH questionnaire during the intervention stage of the study, in further studies, assessing the subjects immediately after a hands-on session could be a valuable source of data as to the effectiveness of the Jing Method™ ACMT treatment on symptoms in the short term. Analyses by Zarrin et al (2023) indicated that 'DASH scores improved immediately after the end of treatment'

Moving the time/day that the DASH questionnaire is completed could produce very different outcomes to those recorded here.

In hindsight having the subjects compete DASH questionnaires on weeks 13, 14 and 15 of the study would have given a better indication of the increase in symptoms post the 'hands on' part of the study, rather than just at week 16.

Compliance to the rehab protocol was the responsibility of the subjects and whilst all effort was made to ensure they 'did' the exercises each week, no record was made of this, other than word of mouth from the individuals. In further studies, to ensure better compliance, an App that requires the subjects to 'log in' each time they need to view the homework videos may ensure better adherence or attending group sessions online at prearranged times. One option to consider for further studies could be the addition of rehabilitation exercises into the subjects individual training programmes. Other considerations such as; specificity on 'when' exercises should be undertaken; pre-training, rest days etc, may change the results found in future studies.

CONCLUSION

In conclusion, the overall finding of this study indicates a positive effect on CrossFit participants with NSSP. Improvements in symptoms and reduction of pain, therefore a reduction in DASH score were recorded, most specifically in the areas related to 'sports' and therefore CrossFit participation.

These positive effects were seen to last beyond the intervention stage – with DASH scores four weeks after the last treatment remaining lower than scores recorded at week one of the study.

To corroborate these findings, it is necessary to determine the efficacy of ACMT more conclusively, more specifically, the Jing Method Shoulder Protocol on NSSP in CrossFit participants. This can be undertaken with further studies, involving larger numbers of subjects and stricter limitations on; suitability for participation and adherence to rehabilitation exercises.

This study was of a short duration with a small number of participants and so is not a true representation of the CrossFit community and would benefit from a longer trial with a greater number of subjects, however the positive findings in this study appear to be consistent with the limited research available on NSSP, massage therapy and recreational athletes.

A collaboration with CrossFit UK would be beneficial to expand the amount of knowledge and research.

Further research studies are required if massage therapy and particularly the Jing Method™ ACMT Shoulder Protocol, is to be considered as a viable option for athletes seeking alternatives to NSAIDS, Analgesics, Hydrocortisone injections, or breaks in training.

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APPENDICES

Appendix - A

Jing BTEC Research Ethics Form

BTEC Level 6 – Professional diploma in advanced clinical sports massage

Section 1: to be completed by student

Student's name:	Sarah Bonney-O'Connell

BTEC Year-group:	2022-2024
Date of application:	3rd May 2023
Student email address:	Bonney@unit-22.com
Title of research project:	Evaluating the Jing method of Advanced Clinical Massage on shoulder pain in CrossFit participants

Section 2:

Does your project involve any primary research using human subjects?

Please delete as appropriate.

	YES	**NO**
Does your project involve any primary research using human subjects?	X	
If yes, does it involve children under 16?		X
If yes, does it involve children under 18?		X
Other vulnerable populations (i.e. mental illness, aged subjects)?		X
Does your project involve NHS patients, NHS staff or Local Authority Service Providers? *If yes, you must obtain 'external ethics approval' for your proposal before the form can be signed-off by 'Jing' and before you can start your fieldwork.*		X
Are you planning to use deception?		X
Are you collecting sensitive personal data such as sexuality, mental health data, etc?		X

Does your project make use of a validated questionnaire? Disabilities of the Arm, Shoulder and Hand	X	
Does your project make use of a new/adapted questionnaire or semi-structured interview checklist?		X

Section 3:

Where is your research being undertaken? The Movement Clinic UNIT 22 Northampton Rothersthorpe Crescent Northampton NN4 8JD		
If your research is being undertaken outside of your own premises, do you have written confirmation from the establishment involved? If yes, please provide evidence.	YES N/A	NO N/A

Section 4:

How will you recruit subjects for this research study?

- Current Clients
- Referrals
- Email list of current/previous clients
- Promote on clinic/personal social media
- Advertise in gyms monthly newsletter

Section 5:

How will you manage participant confidentiality? Ensure that the information refers to GDPR and is compliant with this legislation.

- All data will be held in line with General Data Protection (GDPR)(EU) 2106/679.
- Clients' names will be replaced by numbers.
- All data collected will be stored on a personal computer that is password protected.
- Clients made aware when joining study that their information is kept private and no access given to any third parties.
- Clients advised not to record any online sessions.

Section 6:

1. Outline your project procedure

- Recruit participants to take part in study to establish the effectiveness of the Jing Method of advanced clinical massage on reducing shoulder pain in CrossFit participants.
- Initial 1-2-1 consultation either online or in-person with participants so that details can be taken of the client's history and suitability for the study, and participants can ask questions before giving consent to take part in the research . ROM/orthopedic tests will also be evaluated at initial consultation.
- Weeks 1-6, Issue the DASH questionnaire at weekly intervals via email, for an initial 6-week period – where there is no intervention.
- Weeks 7-12 the clients will attend a once weekly **45 minute** treatment session.
- Each hands-on session will follow the same identical protocol for each participant and will include Structural and indirect MRF, Trigger point work, sports massage, still work and stretching.
- Each participant will be given the same self-care guidance, to include: mobilization exercises, stretches, strength and stability work. This will be limited to 5-10 minutes 4 times per week/ before training sessions. These will be recorded and sent to clients via What's App after each weekly session.
- Weeks 7-12, Participants will be required to fill in the DASH questionnaire 7 days after each treatment and prior to start of next treatment intervention.
- Participants will also be asked to inform the researcher how many times they performed the exercises that week.
- Participants will be sent email reminder to fill in questionnaire 7 days after last hands-on session.
- A final questionnaire to be completed 4 weeks after final hands-on session to assess longer term effects of the treatment.

2. Briefly describe, **what your participants** have to do

- Participants will fill in a screening form online and then attend (either online or in person) a 1-2-1 consultation, where in depth screening will take place to include: health history, lifestyle information, current training schedule (participation in CrossFit sessions) ROM/Orthopedic testing.
- Participants will have the opportunity to answer any questions before agreeing to take part in the study.
- Weeks 1-6 Participants required to fill in the DASH questionnaire for 6 weeks, during which time there is no intervention.
- Weeks 7-12 Attend a weekly 45 minute hands-on session for 6 weeks.
- Adhere to performing self-care 4 times per week during this period.
- Participants will be required to fill in the DASH questionnaire weekly 7 days after each treatment (this will be done prior to starting the following treatment except for final session when participants will be emailed 7 days after session with questionnaire) A follow up questionnaire will also be filled in 4 weeks after last treatment at week 16.
- Weeks 7-12 participants will inform the researcher how many times they performed the self-care exercises.

Section 7:

What sort of materials or stimuli will your participants be exposed to?		
	YES	**NO**
Questionnaires	X	
Pictures (will you take a photo of participants)		X
Sounds		X

Words	X	
Other	X	

If using a questionnaire you are required to attach an example.

For 'Other' please elaborate:

- Relaxation, chilled music in treatment room.
- Jing method Massage Fusion (2015) techniques from shoulder protocol and neck and shoulder protocol.

Section 8:

What sort of people will the subjects be?

CrossFit participants who have non-specific shoulder pain. This is defined as pain in the shoulder (potentially radiating down the arm) that has no one obvious cause and increases with movement of the arm and shoulder, especially following overuse.

Attending 3+ sessions of CrossFit/week.

- Unilateral or bi-lateral shoulder pain.
- Pain is aggravated by participation in CrossFit sessions.
- Participants will be excluded if they have had shoulder surgery, repeated dislocations or cortisol injections.

Section 9:

If your research study involves minors, how will you obtain participation permission and who is the responsible adult?

N/A

Section 10:

Special Issues. Give brief details of other special ethical issues and the controls you will put in place to minimize ethical risk.

- Keep participants information secure.
- Perform an in-depth consultation and screening form and check in/observe participants throughout study to ensure both their physical and emotional wellbeing needs as being met. Signpost to other resources as necessary.
- Advise participants to report any change in pain/other symptoms.
- Participants advised not to talk about study to other people in gym (as this will be the main source of my group) so as not to bias any information they put in questionnaires or influence others.
- There is a minimal risk of the self-care exercises causing injury. To minimize this, participants will be shown in person and have videos to follow at home.

Section 11

What procedures will you follow in order to guarantee the confidentiality of your participants' data?

TIP: Personal data (name, addresses etc.) should not be saved whereby they can be associated with the participants' other data.

- Each participants details are stored on password protected personal

computer.

- In written work each participant is assigned a number to replace their name.

Section 12

Does any of the following apply to your research study?	YES	NO
It requires participants to give information of a personal nature	X	
It involves minors or other vulnerable individuals;		X
It involves paying participants or an alternative incentive to participate		X
It could put you or someone else at risk of injury.		X

Section 13:

I understand that I can only start my project, once this ethical application has been approved. This applies to ALL projects, whether using human participants or not.	YES X	NO

Student's handwritten signature:

_____

(To be completed, once ethical approval has been provided)

Print Name:

Date:

IMPORTANT

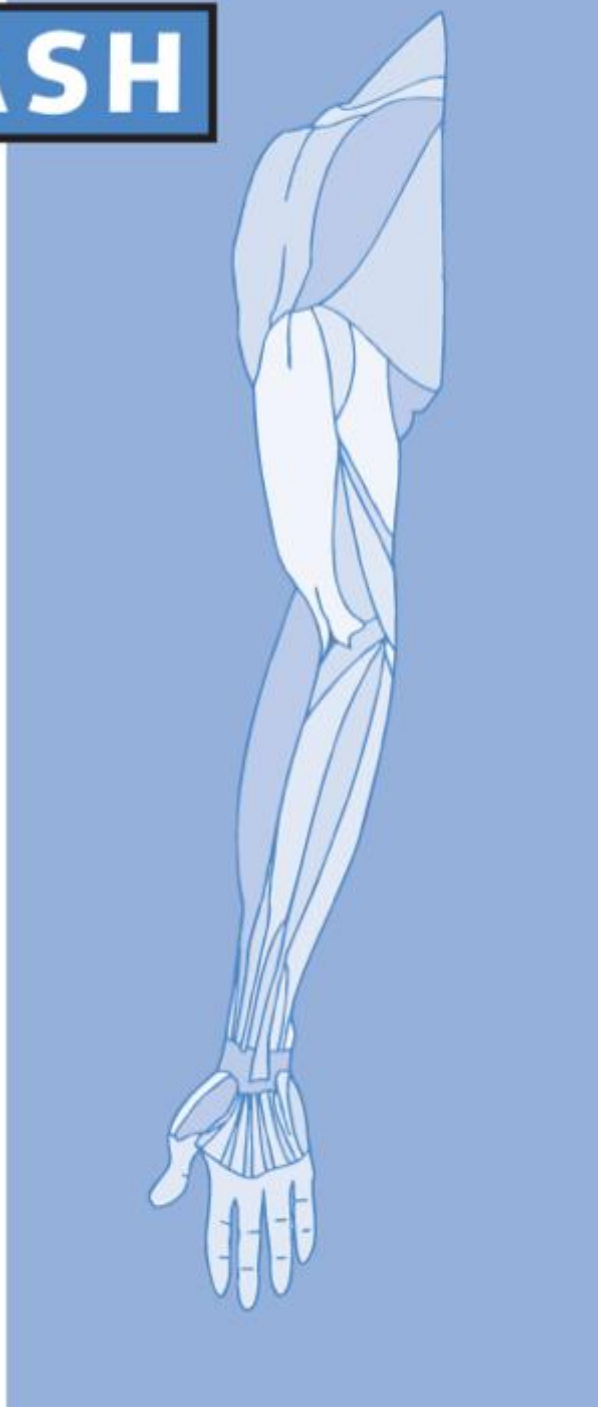
Consent

Informed consent must be obtained for **all** participants before they take part in your project. The Consent Form (example below) should clearly state the parameters and content of the research. It should explain what is expected of the participants and what they will be doing. It should draw specific attention to any elements that could conceivably cause subsequent objections, and the measures you are taking to ensure the confidentiality of their data. It should also state that the participants are free to withdraw from the study at any time. Studies carried out in schools require the permission of the head-teacher, and of any responsible adults as per the head teachers' recommendation. Minors aged over 14 years should also sign an individual consent form themselves. If you are planning to carry out a project whereby you will be in contact with minors, you must establish from the head-teacher or other responsible adult whether the work proposed will require you to have the relevant DBS disclosure. Please seek advice from your Local Authority.

Appendix -B

DASH Questionnaire

THE DASH



INSTRUCTIONS

This questionnaire asks about your symptoms as well as your ability to perform certain activities.

Please answer *every question*, based on your condition in the last week, by circling the appropriate number.

If you did not have the opportunity to perform an activity in the past week, please make your *best estimate* on which response would be the most accurate.

It doesn't matter which hand or arm you use to perform the activity; please answer based on your ability regardless of how you perform the task.

Disabilities of the Arm, Shoulder and Hand

Please rate your ability to do the following activities in the last week by circling the number below the appropriate response.

	NO DIFFICULTY	MILD DIFFICULTY	MODERATE DIFFICULTY	SEVERE DIFFICULTY	UNABLE
1. Open a tight or new jar.	1	2	3	4	5
2. Write.	1	2	3	4	5
3. Turn a key.	1	2	3	4	5
4. Prepare a meal.	1	2	3	4	5
5. Push open a heavy door.	1	2	3	4	5
6. Place an object on a shelf above your head.	1	2	3	4	5
7. Do heavy household chores (e.g., wash walls, wash floors).	1	2	3	4	5
8. Garden or do yard work.	1	2	3	4	5
9. Make a bed.	1	2	3	4	5
10. Carry a shopping bag or briefcase.	1	2	3	4	5
11. Carry a heavy object (over 10 lbs).	1	2	3	4	5
12. Change a lightbulb overhead.	1	2	3	4	5
13. Wash or blow dry your hair.	1	2	3	4	5
14. Wash your back.	1	2	3	4	5
15. Put on a pullover sweater.	1	2	3	4	5
16. Use a knife to cut food.	1	2	3	4	5
17. Recreational activities which require little effort (e.g., cardplaying, knitting, etc.).	1	2	3	4	5
18. Recreational activities in which you take some force or impact through your arm, shoulder or hand (e.g., golf, hammering, tennis, etc.).	1	2	3	4	5
19. Recreational activities in which you move your arm freely (e.g., playing frisbee, badminton, etc.).	1	2	3	4	5
20. Manage transportation needs (getting from one place to another).	1	2	3	4	5
21. Sexual activities.	1	2	3	4	5

DISABILITIES OF THE ARM, SHOULDER AND HAND

	NOT AT ALL	SLIGHTLY	MODERATELY	QUITE A BIT	EXTREMELY
22. During the past week, *to what extent* has your arm, shoulder or hand problem interfered with your normal social activities with family, friends, neighbours or groups? *(circle number)*	1	2	3	4	5

	NOT LIMITED AT ALL	SLIGHTLY LIMITED	MODERATELY LIMITED	VERY LIMITED	UNABLE
23. During the past week, were you limited in your work or other regular daily activities as a result of your arm, shoulder or hand problem? *(circle number)*	1	2	3	4	5

Please rate the severity of the following symptoms in the last week. *(circle number)*

	NONE	MILD	MODERATE	SEVERE	EXTREME
24. Arm, shoulder or hand pain.	1	2	3	4	5
25. Arm, shoulder or hand pain when you performed any specific activity.	1	2	3	4	5
26. Tingling (pins and needles) in your arm, shoulder or hand.	1	2	3	4	5
27. Weakness in your arm, shoulder or hand.	1	2	3	4	5
28. Stiffness in your arm, shoulder or hand.	1	2	3	4	5

	NO DIFFICULTY	MILD DIFFICULTY	MODERATE DIFFICULTY	SEVERE DIFFICULTY	SO MUCH DIFFICULTY THAT I CAN'T SLEEP
29. During the past week, how much difficulty have you had sleeping because of the pain in your arm, shoulder or hand? *(circle number)*	1	2	3	4	5

	STRONGLY DISAGREE	DISAGREE	NEITHER AGREE NOR DISAGREE	AGREE	STRONGLY AGREE
30. I feel less capable, less confident or less useful because of my arm, shoulder or hand problem. *(circle number)*	1	2	3	4	5

DASH DISABILITY/SYMPTOM SCORE = $\left[\frac{(\text{sum of n responses})}{n} - 1\right] \times 25$, where n is equal to the number of completed responses.

A DASH score may not be calculated if there are greater than 3 missing items.

DISABILITIES OF THE ARM, SHOULDER AND HAND

WORK MODULE (OPTIONAL)

The following questions ask about the impact of your arm, shoulder or hand problem on your ability to work (including home-making if that is your main work role).

Please indicate what your job/work is:_____

❒ I do not work. (You may skip this section.)

Please circle the number that best describes your physical ability in the past week. Did you have any difficulty:

	NO DIFFICULTY	MILD DIFFICULTY	MODERATE DIFFICULTY	SEVERE DIFFICULTY	UNABLE
1. using your usual technique for your work?	1	2	3	4	5
2. doing your usual work because of arm, shoulder or hand pain?	1	2	3	4	5
3. doing your work as well as you would like?	1	2	3	4	5
4. spending your usual amount of time doing your work?	1	2	3	4	5

SPORTS/PERFORMING ARTS MODULE (OPTIONAL)

The following questions relate to the impact of your arm, shoulder or hand problem on playing *your musical instrument or sport or both*. If you play more than one sport or instrument (or play both), please answer with respect to that activity which is most important to you.

Please indicate the sport or instrument which is most important to you:_____

❑ I do not play a sport or an instrument. (You may skip this section.)

Please circle the number that best describes your physical ability in the past week. Did you have any difficulty:

	NO DIFFICULTY	MILD DIFFICULTY	MODERATE DIFFICULTY	SEVERE DIFFICULTY	UNABLE
1. using your usual technique for playing your instrument or sport?	1	2	3	4	5
2. playing your musical instrument or sport because of arm, shoulder or hand pain?	1	2	3	4	5
3. playing your musical instrument or sport as well as you would like?	1	2	3	4	5
4. spending your usual amount of time practising or playing your instrument or sport?	1	2	3	4	5

SCORING THE OPTIONAL MODULES: Add up assigned values for each response; divide by 4 (number of items); subtract 1; multiply by 25.
An optional module score may not be calculated if there are any missing items.

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Appendix – C

Treatment Protocol

Prone Work

Fascial work:

- Deep fascial work fists trapezius, erectors
- Fascial finger work Rhomboids, infra & supraspinatus
- Skin rolling Scapula, rhomboids, upper back
- X-hand stretches upper back, scapula.

Muscular and Trigger Point work:

- Stripping and TP: supraspinatus, rhomboids, infraspinatus.
- Stripping and TP: Deltoids; anterior, middle, posterior.
- Friction deltoid tendon.
- Broad work and stripping Triceps.
- TP and friction; Terse major and minor.
- Cross fibre friction: Supraspinatus, infraspinatus, teres minor and subscapularis.

Scapula Mobilisation:

- Rotation of shoulder girdle.
- Scapula sawing.

Side Lying

- Stretching of Trapezius and Latissimus dorsi.

- Supported shoulder circumduction.

Muscular and Trigger Point work:

- Lats, axillary and vertebral boarders of the scapula.
- Sub-scapularis and serratus anterior.

Supine Work

Fascial work:

- Arm pulling.
-

Muscular and Trigger Point work:

- Sternal attachments of Pectoralis major.
- Subclavius and pectoralis major attachments.
- Palmer effleurage pec major.
- Soft fist intercostals/pec major.
- Pec minor, anterior deltoid, subscapularis, coracoid brachialis.

Mobilisation/ Stretches:

- Scapulothoracic joint.
- Glenohumeral joint.
- Pec major and triceps stretch.
- Subscapularis stretch.
- Teres minor and infraspinatus stretch.
- Finish with still work.

APPENDIX – D

Exercises weeks 1-3

Trapezius trigger point release

Banded dislocations.

Shoulder taps in plank (unstable surface)

1/2 kneeling landmine press .

.

Scapular press ups.