

YOGA AS A TREATMENT FOR MUSCULOSKELETAL DISCOMFORTS

• *a hypothesis* •

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Abstract

Introduction: Nowadays, the prevalence of Musculoskeletal Discomforts (MSD) is increasing in the world. As treatment, usually surgery or physiotherapy are recommended, but they are expensive and may cause side effects. A practical course of treatment without negative side effects and with permanent positive effects is lacking. **Objective:** To suggest a practical course of treatment, introduced by a licensed Yoga coach who is experienced in this field, and through that to shed a light on yoga as treatment for MSD. The hypothesis is that yoga may decrease the pain among individuals with MSD. **Methods:** This hypothesis is presented based on the practical techniques used in Yoga including body relaxation and breathing awareness (2 minutes & 3 minutes respectively), warm up/stretching (20 minutes), balancing & strength, full relaxation and refresh. This training exercise is suggested to be done in the morning, 2-3 times a week for 8-10 weeks. There is no age nor gender limitation. **Result:** It is hypothesized that 1 hour of Yoga exercise can be useful in decreasing the symptoms of MSD by increasing the flexibility of muscles and range of motion in joints. **Conclusion:** A series of Yoga training exercise can be suggested for the physiotherapist to treat the people with MSD.

Keywords: Yoga; Musculoskeletal Discomforts; Physical Therapy; Hypothesis

INTRODUCTION

The term musculoskeletal disorders (MSD) refers to a broad range of conditions that can

affect any part of the musculoskeletal system, including the muscles, bones, nerves, joints and

spinal discs, along with supporting blood vessels and connective tissues such as tendons, ligaments and cartilage.⁽¹⁾ Injuries can occur such as sprains, tears and strains, in addition to any form of acute or chronic soreness or pain within the support frame of the body.⁽²⁾ These disorders are normally degenerative; worsening over time if the conditions that lead to them are not addressed properly.⁽³⁾

The most commonly used non-pharmacological approach for treatment of MSD is exercise therapy.⁽⁴⁾ For most cases of non specific lower back, neck and shoulder pain, moderate exercise therapy is generally an effective treatment.⁽⁵⁾ However, treating those with non-specific pain often proves more challenging, in large part due to the wide range of potential causes involved.⁽⁶⁾ Unfortunately for healthcare professionals, a large percentage of those who suffer from lower back, neck and shoulder pain fall into this category.⁽⁷⁾

The kinds of treatment used for such non-specific issues tend to be inconsistent, ranging from psychosocial care and pharmacotherapy to radiotherapy and surgery, and the results are often mixed.⁽⁸⁾ Some evidence suggests the influence of psychosocial factors in the development of lower back, neck and shoulder pain, in addition to such organic causes as spinal instability resulting from poor ligament function and deficits in neuromuscular coordination.⁽⁹⁾ Whatever the causes, in order for a treatment to be truly effective, it should not only relieve pain, but also bring about a tangible change in the body's level of functionality and the individual's overall quality of life.⁽¹⁰⁾

Yoga is as one of the most famous and known courses of exercises accepted among Physical Therapists.⁽¹¹⁾ It contains a series of stretching exercises, mostly focused on big muscles. But there are different types of Yoga (based on different traditions) for different purposes. Here we will suggest a type known to be useful for MSD.⁽⁴⁾ This hypothesis is presented based on the previous studies and theories behind stretching training exercises. All the steps of this training exercise are mentioned one by one and also a Swiss ball

is suggested to be used instead of a hard tatami. The expected results of this hypothesis is based on decreasing the rate of MSD and severity of pain.

METHODS

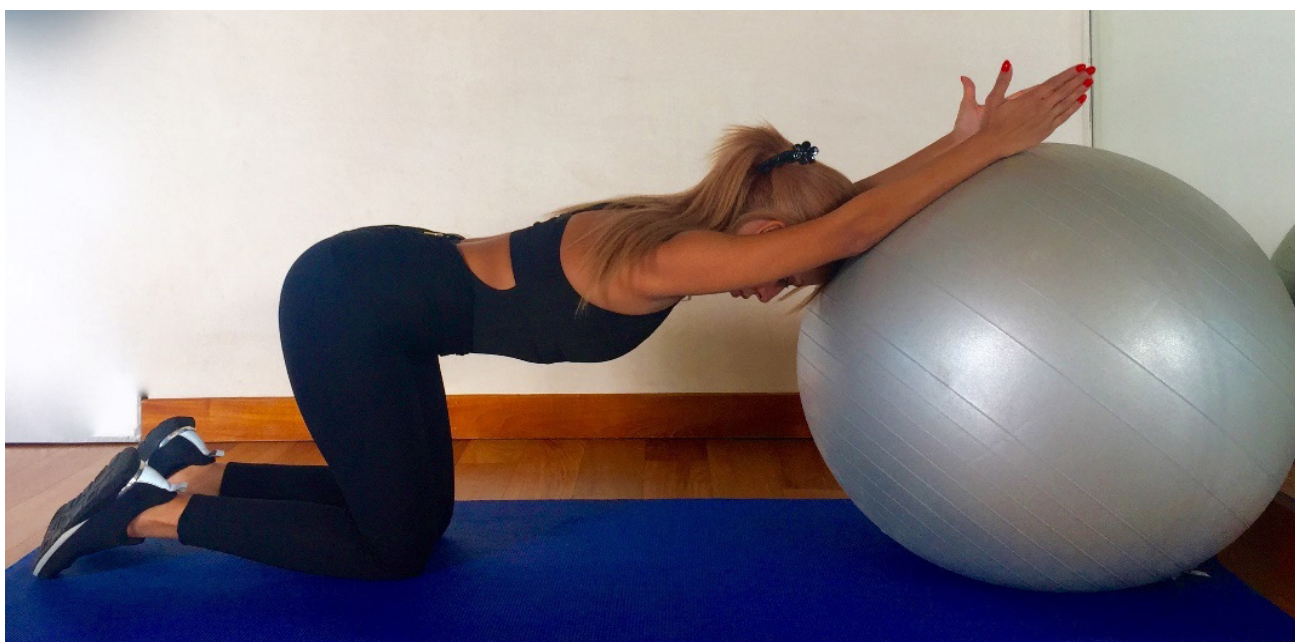
This method is suggested to be done in the morning, maximum for 1 hour. Doing 2-3 times a week for 8-10 weeks is suggested for this training exercise. There is no age nor gender limitation as it is based on stretching exercises and feedback of subjects during the session. As an experimental research, it is suggested that a research should be conducted with at least 60 subjects (30 subjects will form the control group and 30 subjects will undergo the intervention). There are different methods suggested to measure the severity of MSD. The easiest way is using the standard questionnaires such as Nordic or Cornell. Based on the previous research, Cornell questionnaire was suggested instead of Nordic because it showed more accuracy in collecting data with regards to severity of pain.⁽¹⁾ The other method is using a Goniometer to see the changes in range of motion.⁽¹²⁾ The most common zones for using the goniometer among subjects with MSD are hip, knee, shoulder and neck. A twelve inch Goniometer would be a suitable choice.⁽¹³⁾ The measurements should be done by an orthopedist or a physiotherapist and need to be done one by one in pre-test and after 8-10 weeks training exercise.

This method is just as a hypothesis and is not tested among subjects yet, but it has been based on the steps and ways used in this type of yoga.

Further details below:

a) **Body relaxation and breathing awareness, 2 minutes & 3 minutes respectively**

Body relaxation: sitting position could be the crossed legs or Japanese pose with forehead on the Swiss ball, tummy tucked in and round spine. Relaxation starts from the forehead and follows to neck, fingers, arms, shoulder, spine, lower back, hip, thigh, ankle, and lastly toes.



Breathing awareness: breathing focus on inhalation and exhalation through the nose only. Inhale through the nose with lung expansions, followed by stomach; exhale through the nose with stomach fully contracted. Follow by breathing with control (3 counts for full inhalation, hold the breath for 3 counts, and then exhale for 5 counts). 1 count = 1 second.

b) Warm Up / Stretches (20 minutes)

Warm up starts from the neck. To make circles starting from both sides & 3 sets for each side.

Arms are to be stretched by pushing the Swissball forward, pressing down the forehead on the mat while lengthening the spine with shoulders relaxed. Body is to be rolled up, back to the original sitting position after 10 counts (3 sets).



Subject will kneel down on the mat with the Swissball in front of body. Then, they are to lean the stomach down on the Swissball and interlock

fingers with hands behind lower back, then stretch the hands forward while placing the chin on the Swissball with both elbows straight (3 sets).



Same starting position as the third position, subject has to place both palms on the Swissball next to the chest, straighten both legs with knees away from the mat, reach the heels nearest towards the mat to stabilize the lower body, push the chest upward

and straighten their hands (with elbows relaxed), shoulders are to be rolled backwards and held in that position for 10 counts. The upper body is to be rolled down while the chest relaxes on the Swissball, both knees are to be relaxed on the mat (3 sets).



Same starting position as the third exercise, subject must straighten both legs with knees away from the mat, stretch both hands back, roll shoulder backwards, take an inhalation then lift the chest up and away from the Swissball, while trying to reach both hands with fingers interlocked in between the

inner thighs. They must then position the upper body leaning backwards and hold this position for 10 counts. The upper body is to be rolled down and the chest to be relaxed on the Swissball, while both knees are to be relaxed on the mat (3 sets).



The Swissball must be placed on the right side, with both knees remaining in bent position, the right palm to be placed on the Swissball, the left hand to be raised straight and towards the ceiling. Subject must inhale to reach the left hand higher, and then bend the upper body towards the right one. This

position is to be held for 10 counts, as subject must feel the stretch from the left side waistline up to the left under arms and extend it to the left fingers. Inhale again to come back to the original kneeling position (3 sets) then repeat this on the left side.



Standing on the mat, with both legs open 4 feet apart, subject will place the Swissball in front of the body with their palms on it. Then, they will push the Swissball forward with both hands, while ben-

ding the upper body forward to 90 degrees, holding both arms next to the ears level. In the mean time they will feel both inner thighs stretching. This position must be held for 10 counts (3 sets).



Standing with both legs close to each other, subject will place the right leg on the Swissball with the right knee bent while the left leg stands firmly on the mat. They will interlock the fingers forward, inhale then stretch the hands up, palms facing upwards. The right leg is to be straightened, while maintaining the hip in a square alignment. The subject will inhale and then exhale while bending the upper body forward. Both hands are to be

placed and held around the right ankle with the stomach and chest leaning lightly on the right leg. People who are not too flexible may hold the calf. This position is to be held for 10 counts. Subject will inhale to lift the upper body up with both arms besides the ears, and exhale to release the hands and right leg. This is to be repeated on the left side (with 3 sets each side of the body).



c) Balancing & strength

There are many balancing positions in Swissball yoga. Mostly to train our focusing skills, incorporate with the breathing techniques and strength needed during the balancing positions.

Strength mostly focuses on core muscles and arms. Balancing and Strength has many positions, it will mostly depend on the level of each individual.⁽¹⁴⁾



d) Full relaxation

To place both legs on top of the Swissball, with other parts of body on the mat. Place both hands on the mat or floor slightly away from the hip.

Relaxation starts from the toes, ankle, calf, thigh, lower back, spine, shoulder, arms, fingers, neck and lastly on the subjects' facial muscles.



e) Refresh

Slowly bring the awareness back to the subjects, moving fingers and toes, with both closed legs together. Subject is to raise both arms above the head ready for a full body stretch, from fingers to the toes. Bend both knees, turn the body to the right and release the fit ball away. Slowly push the body up, sit at the comfortable position that could be either half or full lotus or legs crossed, with palms together above the chest center. Subjects are to finish the session with 3 deep inhalations and exhalations.⁽¹⁵⁾

EXPECTED RESULTS

The theory behind this hypothesis is standing on stretching the muscles that got tight.⁽¹⁶⁾ Doing a regular series of training exercise, they can affect the flexibility of muscles and also can increase the range of motion in related joints.⁽¹⁷⁾ This hypothesis is mostly focused on treatment of MSD. So, as the highest rate of MSD is related to lower back, neck and shoulder,⁽⁷⁾ this hypothesis has focused on these areas, and it is expected that, after 8-10 weeks, Yoga training exercises can decrease the severity of pain among subjects. It is expected that, the first

week is for adaptation and the main improvement will start from second week. It is also expected that after the 4th week of treatment, there is a need to increase the intensity of training exercise.^(17,18) So, it seems, after 8-10 weeks the range of motion in hip, knee, shoulder and neck should be increased and this will be the reason for a decrease in pain severity.

DISCUSSION

Expected results are that after 8-10 weeks Yoga training exercises can affect the flexibility of the muscles, increase the range of motion and finally lead to decrease of the severity of pain and symptoms of MSD.

In 2015 in a research by Peppone et al., they showed that 4 weeks of Yoga training exercise can decrease the symptoms of musculoskeletal disorders. Their suggested method was done 2 times a week and each session lasted for 75 minutes.⁽¹⁹⁾ In 2016, Cheung et al., introduced Yoga as an effective method for managing musculoskeletal conditions. Their results was presented based on their review. The results of their review showed that 45-60 minutes doing Yoga training exercise for 2-3

times a week for 6 to 12 weeks is known as an ideal course for pain relief. But, they mentioned that, in some cases depending upon the severity of pain and personal traits of the subjects, the duration of the treatment should be from 1 to 6 weeks.⁽²⁰⁾ Other research in 2015 showed that neck, shoulder and lower back are the most prevalent musculoskeletal disorders among office workers. They did a comparison among 300 dentists who were doing Yoga. Their results showed that the group who were doing Yoga had a decrease in their musculoskeletal disorders scores. The severity of pain was measured by Nordic questionnaire.⁽²¹⁾ Noor et al. showed that doing a regular training of Yoga for 3 months (2-3/week) can affect the health parameters such as physical and psychological parameters.⁽²²⁾ Kwong et al. showed that Yoga is not only effective on physical parameters, but also effective on physiological parameters such as coronary heart diseases.⁽²³⁾ In 2016, Shariat et al. used a validated Cornell questionnaire to measure the severity of pain among subjects with MSD. They compared the reliability of this questionnaire and also Goniometer to assess and verify if those are reliable tools to measure the severity of pain and MSD.⁽¹²⁾ Then they suggested a series of training exercises including stretching to increase the flexibility of muscles and range of motion, as the main issue related to MSD was tightness of muscles.⁽⁵⁾

All of these previous results can support our hypothesis, because: a) it is known that tightness in muscles is one of the reasons for MSD; b) the necessary time for an effective treatment with Yoga is 6-12 weeks, 2-3 times a week; c) Goniometer and MSD questionnaires such as Nordic and Cornell can be used for measurements; d) prevalence of MSD was mostly in neck, shoulder and lower back areas.

So, as suggested by our hypothesis, a course of Yoga exercises lasting 8-10 weeks, 2-3 times a week (1 hour each session), with focus on lower back, neck and shoulder could be useful and effective.

But it should be highlighted that previous Yoga training exercises were mostly done on tatami, on

the floor. But here, it has been suggested to use a Swissball, instead of a tatami, as it can be useful to decrease the pain caused by contact with the hard floor. Also the elasticity power of Swissball can help to do the exercises with higher range of motion.

CONCLUSION

There are different types of physical activity suggested by the physical therapist. But some of them need to be updated. Also, some of them are not easy to do and not suitable for all ages. Based on the literature, Yoga can be as one of the multipurpose exercises suggested by the Physical Therapists.^(4,24) The hypothesis mentioned in this paper seems valuable as it is focused on an issue with high prevalence among different groups of people regardless of age and gender. Also, this hypothesis mentioned a new environment for doing the Yoga training exercise, that is with the Swiss ball. It is expected that this suggested hypothesis can decrease the rate of MSD among people without any side effect.

But this hypothesis is needed to be tested with subjects with different categories of MSD. Also, it is suggested to do a clinical research about Yoga and MSD, and compare the effects of Yoga with other exercise on MSD among different populations.

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