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Study Protocol: A Randomised Controlled Trial on Effectiveness of a Worksite Health Intervention on Common Musculoskeletal Problems and Work-Related Quality of Life (WRQoL) among Female Workers in the Garment Manufacturing Sectors

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Abstract

Garmenting is one of the many labour intensive sector that provides gateway for developing countries in entering into the global market. Southern production centres employ more than 80% women as part of their workforce. Working for a long period of time without rest, absence of personal protective equipment and inadequate provision of ergonomic facilities at workplace leads to discomfort and fatigue.

Method and Method: 150 female workers with common musculoskeletal problems and working at the selected garment manufacturing factories and fulfilling the selection criteria will be randomly assigned to experimental and control group. The work site health intervention will be provided to experimental group, which involves 3 sessions for a week namely orientation to body mechanics, demonstration on neck and lower back exercise and nutritional education. After the demonstration, the female worker will be instructed to perform the exercise, 5 times in a week for 2 week in the workplace and thereafter for at least 3 times in a week for a month in the home. The outcome will be assessed at end of the 2nd week and 5th week. The control group who will not receive any intervention. The data will be analysed by frequency, percentage distribution, mean and standard deviation. Chi-square test and independent t-test will be used to assess the difference in various parameters.

Discussion: The result of the study may help to guide the garment workers to initiate the simple intervention in the worksite and would also reduce the occurrence of the common musculoskeletal problems.

Keywords: *Worksite Health Intervention, Musculoskeletal problem, Work-Related Quality of Life, female Workers, Garment manufacturing sectors.*

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Introduction

Garmenting is one of the many labour-intensive sectors that provide a gateway for developing countries in entering into the global market. It offers important opportunities to countries to start industrializing their economies and in course of time diversify away from commodity dependence(1).

The garment sector is a thriving industry in

Bangalore, Tirupur and Chennai in the south, and in Delhi and surrounding NCR region in the north. While the northern production centres employ primarily a male workforce, in the south more than 80% of the workforce is women.[2]

Women who are sewing mission operators perform their tasks sitting which involves two work tasks. The first one is the "sewing" task. The female worker sits on a chair, leans forward at an angle of 45, and moves her hands backward and forward and to the left and right to move the fabric (45-100 times per minute). The arms are positioned over the machine at an angle between 45 and 90 to the trunk. The head is positioned forward at an angle between 10 and 20. One of the legs moves the pedal of the sewing machine but the other is static. During the second work task, the female worker bends down to the right at an angle of 45 in order to get the pieces such as zippers and the like (30-50 times per minute)[3].

A study conducted in India reported, that out of 3858 workers examined during their annual health appraisal, around 694 (18.0%) had applied leave due to illness, of these only 104 (2.7%) had extended to more than 15 days. As a common symptom, worker who performs processing jobs with a longer duration of standing may experience discomfort in the legs, neck and shoulder. If standing position is practiced continuously, the worker may feel discomfort and fatigue particularly in the lower limb muscles, lower back, and feet. As along-term consequence, prolonged standing contributes to severe health problems such as chronic venous disorders, circulatory problems and degenerative damage to the joints of the spine, hip, knees and feet. [4].

Exposure to MSDs risk factors are increasing in younger working population [5]. Though factory workers areat risk for various health problems, the literature support makes it evident that the prevalence of musculoskeletal problem is the most common problems among garment factoryworkers varied from 15.5% to 78.89%.The most reported problem among those involved in sewing, cutting, and deliveringwas back pain,with the prevalence ranging from 22.2% and 68.5%. The common causes for the musculoskeletal problems were continuous sitting for long hours, bending and twisting at the waist, abnormal posture, movements during work and continuous standing. Nutrition plays a key role among these workers as improper or inadequate diet leads to malnutrition, whichmay further aggravate theseproblems[6].

A recent ILO study estimated that 22% of the global workforce, or 614.2 million workers, work more than 48 hours per week. According to a multi-country study in the clothing industry, reports that, workers had to work overtime in order to earn wages. The study also concluded that on an average factory workers worked more than 60 hours per week, and in 88% of cases more than six days in a row[7].

In Bangladesh, many garment workers work 14-16 hours shifts each day (most often six days per week) in Pakistan, 10 or more hours a day. In Thailand during peak season, excessive overtime is common because factory owners are reluctant to hire additional workers. During off-peak season, the average working hours is 7.7 to 10 hours a day. In India and Laos this overtime, though against the law, is compulsory[8].

According to the European survey on working conditions, 8.1% to 72.9% of workers reported exposure to risk factors of musculoskeletal disease[s][5]. Beyond different recognition practices, there are indications that musculoskeletal diseases affect the female working population more than the males. Further, there is a severe lack of awareness about these issues.

The musculoskeletal problems and the discomfort experienced by the individuals is also depend on the way an individual eat and the type of nutrients and fluids that brought into the body. Certain products and treatments may accelerate the rate in which the body heals itself.Some of the treatment included are Transcutaneous Electric Nerve Stimulator, electrotherapy, acupuncture, massage, icing, and anti-inflammatories. While these treatments are available to reduce the inflammation, however it is necessary to control the levels of inflammation around the joints of the back with alternative approaches. One such approach that naturally adopted to reduce the inflammation is by diet modification,and increase the intake of natural anti-inflammatories foods in the diet. There are also vitamins and dietary supplements to improve musculoskeletal health. But the relationship is not studied.

Work-related musculoskeletal problem are often associated with lower level of quality of life. Very few studies only have evaluated the effect of a specific program on the prevention of WMSD and the quality of life (QL)[9].

In the last few decades, workplace ergonomics studies focusedmore;however,limited emphasis

were made on the worksite interventions to prevent work-related musculoskeletal problems. It has also beenreviewed from the literature that there is a strong evidence for positive effect on management of low back pain by exercise training on different population and settings.

With the above evidences, the investigator felt the need to find the Effectiveness of a Worksite Health Intervention on Common Musculoskeletal Problems and Work-Related Quality of Life (WRQoL) among female workers.

Materials and Method

The Primary Objective Includes:

1. To determine the common musculo- skeletal problems experienced by the female workers in the garment manufacturing sectors
2. To assess the Work-Related Quality of Life among female workers with musculo-skeletal problems experienced before implementation of Worksite Health Intervention.
3. To evaluate the effectiveness of Worksite Health Intervention on Common Musculoskeletal problems experienced and Work -Related Quality of Life among female workers

Study Design: The study adopts two-armed randomised control trial methodology, to assess the effectiveness of the Worksite Health Intervention on common musculoskeletal problems and work-related quality of life among females.

Ethical Consideration: As a part of research programme, Saveetha University Ethics Committee, Tamilnadu, approved the study. The ref.no: - 007/09/2017/ IEC/SU, which qualified for registration in the Clinical Trial Registry-India numberCTRI/2018/08/015168.

Setting: Out of the North, South, East and West zones of BBMP, north zone will be selected for data collection as this zone houses majority of the garment factories of Bangalore. The garment manufacturing factories are concentrated in Pennya industrial estate, Rajajinagar industrial estate, Yeswanthapur, Gorguntepalaya and Srirampura. Two study areas are to be selected by simple random sampling from the industrial database available. The factories are categorised into small medium and large sized on the basis of the number of workers in each factory.

Sample: To detect a medium effect size (0.5) in the quality of life (power 0.8; alpha 0.05) at a 2-sided significance level of 0.05, the sample size is estimated was 150, which was inflated to 200 anticipating 10-20% rate. Female workers (75 in experimental group and 75 in control group) in the age group of 18-60 years and are working in the selected setting with the main task as tailoring, helping; checking, cutting, designing,sewing, ironing and finishing will be screened for common musculoskeletal problems. 200 female workers with the musculoskeletal problems will be randomly chosen and assessed into experimental and control group. To recruit the subjects the following criteria will be used.

Inclusion Criteria: Female Workers:

- Working for a minimum of 6-8 hours in a day with minimum of 1year experience in the garment factory.
- Who areable to read and write in Tamil/Kannada/ English.

Exclusion Criteria: Female Workers:

- undergoing physiotherapy/any treatment for this problem
- who had undergone any surgery within a year
- who are diagnosed with structural anomalies
- who have spinal cord compression
- who are pregnant
- suffering with post-traumatic conditions.

Tool: Validity, reliability and pilot study:

The following standardised tools are used.

a. Nordic musculoskeletal questionnaire to assess the common musculoskeletal problem

b. SF 36V2 to assess the work-related quality of life

Nine expert had validated the tool, 3 from the department of community medicine 2 from physiotherapist, 3 nursing faculty with PhD and 1 nutritionist. In order to suit to the current setting the reliability of the tools has been once again tested by SPSS software and the Alpha Coefficient r=0.78 for Nordic musculoskeletal questionnaire and 0.89 for the work related quality of life, which is within the acceptable limit. Pilot study on 15 subjects performed proved the practicability of the study.

The Intervention Program: Written consent will be obtained after the oral and written information given by the researcher regarding the purpose and nature of the study, a detailed plan about the work site intervention, benefits, the risk involved, and withdrawal from the study. Confidentiality of the subjects would be maintained.

Pre-Intervention: Female workers in the garment factories will be assigned in to the experimental and control group. The common musculoskeletal problems and work related quality of life would be assessed.

Approximately 40-45 minutes will be given to the female garment workers to complete the questionnaire. After receiving the questionnaire, the data will be verified for the completion of data.

Work site Health Intervention: The work site health intervention to experimental group refers to a structured program developed by the researcher for the female workers in garment manufacturing sectors to change their unhealthy and ergonomic postures and to enable them to prevent the occurrence of common musculoskeletal problem. It comprises orientation to body mechanics, back exercise training, nutrition education involving lecture cum demonstration by the researcher. Each session would last for 10-15 minutes on all days.

Day 1: Orientation to body mechanics, anatomy of spine, function of the cervical spine and normal postures to be maintained in daily life by lecture method using charts and posters

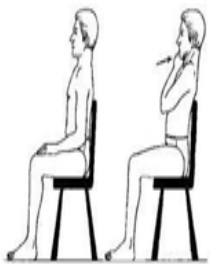
Day 2: Demonstration of exercises, which includes

- Neck exercise
  - Head retraction in sitting
  - Neck extension in sitting
  - Side bending of the neck
  - Neck flexion in sitting
- Low back exercise
  - Lying face down
  - Lying face down in extension
  - Flexion in lying
  - Flexion in sitting
  - Flexion in standing
  - Bottom to heal stretch
  - Bridges
  - Knee rolls
  - Hamstring stretch

The researcher demonstrates the exercise as shown in the Figure 1, at the workplace for 10-15 minutes and the participant are asked to follow. A ready reckoner would be provided to the participant.

Post intervention: After the training, the female factory workers are asked to perform the back exercise every day for at least 5 times a week for 2 weeks in the work place under the supervision of the researcher and at home for at least 3 times a week for a month. On Day 3, the researcher will be providing education on nutrition, which includes food pyramid, function of the food, concept of healthy eating and anti-inflammatory diet for 30-45 minutes by lecture cum discussion method.

The control group will not receive any intervention during the study period. But would receive the same after completion of the data collection.

			
Head retraction	Neck extension	Side bending of neck	Neck rotations/neck flexion

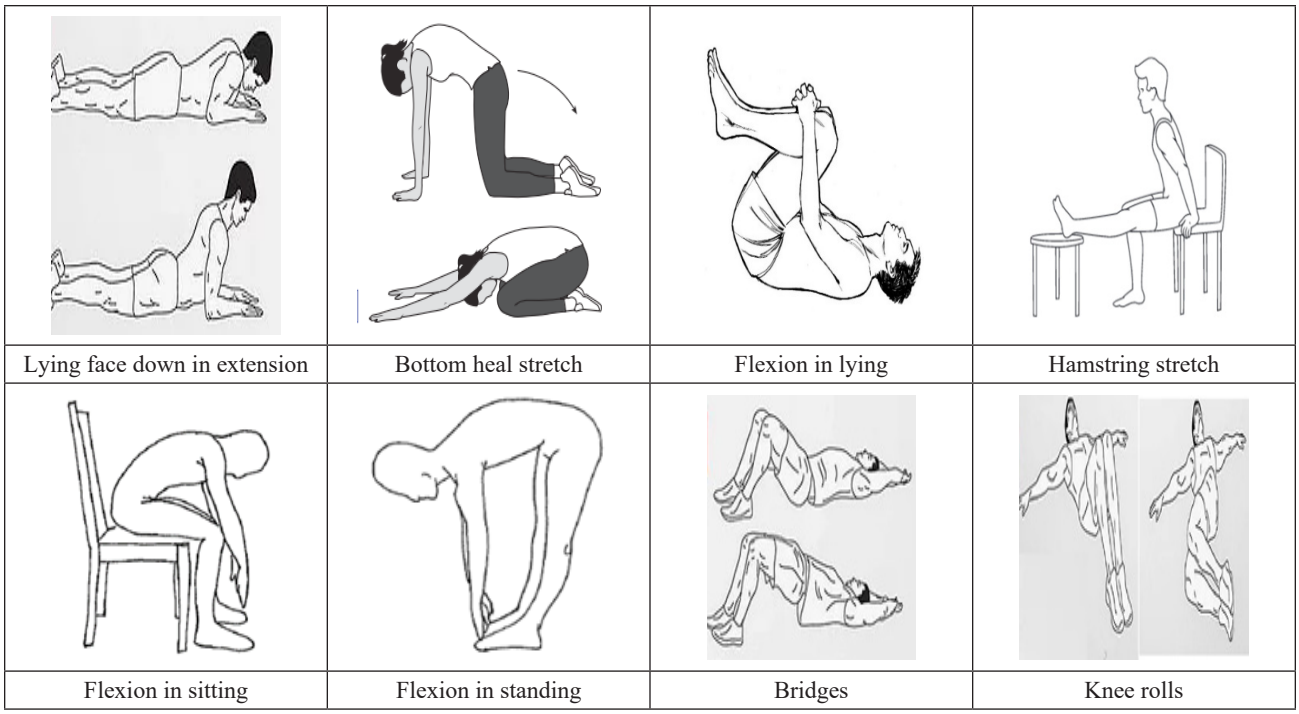


Figure 1: Illustration of the Neck and low back exercise

Outcome Measures: Baseline data includes age, height, weight, total family monthly income, type of family, habits type of job, duration of the work per day, availability of rest period during working hours, and option of over time.

Primary outcome measures

1. Musculoskeletal problems experienced and its intensity
2. Work-related quality of life

Randomization: The list of garment factories from the industrial database will be categorised into small and medium sized on the basis of the number of workers in each factory. A separate list of small size factories and medium sized factories will be prepared. The factories will be clustered into two; Cluster 'A' small sized factories and cluster 'B' medium sized factories. Using simple random sampling technique, from each cluster 2 factories will be allocated to intervention group and control group. Based on selection criteria samples will be drawn 75 in experimental and 75 to control group.

Blinding: Due to the nature of the research, the researcher will not be blinded and may know which factory will be receiving the intervention. However, the female workers participating in the research study neither will be aware of the expected outcomes of the study, nor the other group participating in the research study

Planned statistical analysis: All the data collected will be entered in the excel format. The data will be analysed using SPSS version 20.0. Frequency, percentage distribution, mean, standard deviation, Chi-square test and t-rest will be employed for the difference in the various parameters.

Discussion

Musculoskeletal problem is one of the common health problem experienced by the female factory workers. The workers neither take care of themselves nor have time to meet the health professionals. Studies revealed that incidence and recurrence of pain could be reduced when adequate care is provided. This study aims at designing a worksite health intervention that could be implemented during the working hours. The intervention designed would be simple and can be done in the work place itself. Changes in the intensity of pain in the lower back and neck would be noted before and after the intervention. Educating on the body postures and nutrition helps the workers to monitor their food and beverages conception. Modification in the diet helps to examine the changes in the quality of life. Result of this

study may help to guide the workers to initiate the simple intervention in the worksite reduce the occurrence of the musculoskeletal problems.

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References

1. Roy S. Garments Industry in India: Some Reflections on Size Distribution of Firms. IhdindiaOrg [Internet]. 2009;1–30. Available from: http://www.ihdindia.org/Formal-and-Informal-Employment/Paper-5-Garment-Industry-in-India-Some-Reflections-on-Size-Distribution-of-Firms.pdf
2. Mani M. Garments Sector and Unionisation in India–Some Critical Issues. 2011.
3. Öztürk N, Esin MN. Investigation of musculoskeletal symptoms and ergonomic risk factors among female sewing machine operators in Turkey. Int J Ind Ergon [Internet]. 2011;41(6):585–91. Available from: http://www.sciencedirect.com/science/article/pii/S0169814111000837
4. Halim I, Omar A. A Review on health effects associated with prolonged standing in the industrial workplaces. Ijrras. 2011;8(July):14–21.
5. E.Schneider XI. Work-related musculoskeletal disorders in the EU—Facts and figures [Internet]. 2010. 1-184 p. Available from: https://osha.europa.eu/en/tools-and-publications/publications/reports/TERO09009ENC
6. Lillypet S, Jain T, Joseph B. Health problems among garment factory workers : A narrative literature review. 2017;6(2):114–21.
7. ILO. Wages and Working Hours in the Textiles, Clothing, Leather and Footwear Industries [Internet]. 2014. 35 p. Available from: http://ilo.org/sector/activities/sectoral-meetings/WCMS_241471/lang--en/index.htm
8. Stotz L, Kane G. Facts on The Global Garment Industry [Internet]. clean clothes campaign. 2015. p. 1–21. Available from: https://cleanclothes.org/resources/publications/factsheets/general-factsheet-garment-industry-february-2015.pdf
9. Santos AC, Bredemeier M, Rosa KF, Amantéa V a, Xavier RM. Impact on the Quality of Life of an Educational Program for the Prevention of Work-Related Musculoskeletal Disorders: a randomized controlled trial. BMC Public Health [Internet]. 2011;11(1):60. Available from: http://www.biomedcentral.com/1471-2458/11/60