The study entitled “Physical Stress, Productivity and Perceived Exertion of Women in Charkha Spinning” is an attempt to quantify the physical stress and perceived exertion of the spinners in khadi spinning units. The objectives of the study were to make a profile of the spinners, understand the job context and content, identify their health problems and evaluate the man machine system by assessing postural and physical stress, productivity and perceived exertion in spinning so as to identify the most productive charkha and suggest measures for increasing productivity and reducing postural strain in charkha spinning.

An explorative study design was followed for the present study. A baseline survey was conducted among 150 workers and the data on physical stress, postural discomfort and postural stress were collected from a sub sample of 10 subjects each chosen from the spinners working on six, eight and twelve spindle charkhas. The spinners were all women. Most of them hailed from rural areas and belonged to low socio-economic groups. The mean monthly income of their families was Rs.2045.40. More than half of them were below the poverty line. The mean age of the spinners was 29 years and the number of children ranged from one to four. The six and eight spindle charkhas were hand operated and the twelve spindle charkha was pedal operated. The majority of the workers had less than ten years of experience. Their mean monthly earnings from charkha spinning was Rs.41K.10. The workers on an average contributed 2K percent of their family income.

Regular income yield, indoor work, availability of work within the locality, lack of skill in other jobs, and the need to supplement the family income were the personal and family reasons reported by the women for taking up this economic activity. Twenty seven percent of the spinners were active in women’s clubs. The workers reach the units by 8.00 AM and work till 5.00 PM. Forty percent of the spinners had undergone short-term formal training in spinning. On an average the spinners worked for 19.6 days in a month. At the spinning units, the raw cotton in the form of sliver is converted into yarn. Wages are paid on piece rate and paid either weekly or biweekly or monthly. The earning potential of the spinners increased significantly with increase in the number of spindles in the charkhas.

Each spinning unit is housed in a single room building with an enclosed stock room. The units were seen congested with inadequate moving space.
between the charkhas. The work satisfaction of the spinners working on the three different charkhas differed significantly. Overall perception of the workers on physical stress at work site also differed significantly. Uniform psychological stress levels were observed in all the categories of workers.

Respiratory complaints like cold and cough, wheezing, defective eyesight, chest pain, muscular pains in various parts of the body were the health problems reported. Excessive sweating and dryness of throat and mouth was reported by more than 85 percent of the spinners while working. The total body discomfort score showed a significant difference in the pain levels of the three categories of the charkha spinners and the highest level was noticed among six spindle charkha operators. The body angle and lumbar angle of the hand extended and hand down posture differed significantly from the straight sitting posture in both six and eight spindle charkhas and indicated a higher level of postural stress due to constant changes. The mean working heart rate was 85.8, 94.8 and 91.1 beats per minute for six, eight and twelve spindle charkhas respectively. Spinning on six spindle charkha could be considered a very light activity and work on eight and twelve spindle charkha light work. The mean score of perceived exertion was 2.02 (six spindle), 2.95 (eight spindle) and 2.71 (twelve spindle) on a scale with values ranging from zero to two. The mean cardiac cost of the subjects working on the three varieties of charkhas was 4346.61.

A spinning rate of 11.37, 17.65 and 25.28 hanks of yam per day was recorded for the six, eight and twelve spindle charkhas respectively. The man machine system most appropriate for charkha spinning was found to be ideal in the twelve spindle charkha followed by eight spindle charkha. Low income, high work load and low speed of production were the major problems encountered by the spinners.

Based on the observation and work evaluation, shifting of the handle towards the front in the six spindle charkha, reduction of handle length in the eight spindle charkha and provision of back support for the seat of the twelve spindle charkha have been suggested for improving efficiency of the charkhas. Poised sitting posture is to be ensured through worker education. A shift from the old models of charkha to the twelve spindle charkha is a felt need to improve the status of charkha spinning and the women workers.