

In the garment industry, sewing-machine operators are regarded as a main factor in the production process. Many sewing-machine operators have problems with musculoskeletal pains due to prolonged work, resulting in low productivity.

The objectives of this study were 1) to survey the nature and problems of prolonged sittings of sewing-machine operators, 2) to measure, collect and analyze the anthropometric data and 3) to determine the suitable configurations of sewing workstations including table height, table tilt, chair height, chair tilt and backrest distance. An experimental workstation was built consisting of an adjustable chair and a sewing table. For this experiment, the table height and the tilt were independent variables, while the chair dimensions could be adjusted by an operator.

The results of the questionnaire survey with 410 sewing-machine operators show that over 50% of them have discomfort in the areas of waist, neck, shoulder, back, buttock, ischium and lower legs. The respondents had an opinion that the discomfort in the body regions has affected their work.

The experiments were conducted with ten female subjects, tested on the experimental workstation by varying the workstation configurations according to the experimental design for 4-hour work periods. Discomfort was evaluated by the subjects themselves before the start of work and then at one-hour intervals throughout the four working hours. Photographs of the working postures of the operators were taken and then used for biomechanical studies to determine trunk and head inclinations and static muscle loads on neck and lumbar. The results of the experiments on the experimental workstation were statistically analyzed and compared with those for the old workstation. It was concluded that the suitable sewing machine workstation table should be 6 cm. higher than the elbow height while sitting (measured horizontally from the pedal). The table tilt should be 10 degrees. This study finds that the average height of the chair adjusted by the subjects is 46.1 cm, the average tilt of the work seat is 2 degrees (forward) and the average backrest distance is 37.4 cm.