

**A STUDY TO INVESTIGATE THE EFFECT OF FABRIC DUST ON THE
HEALTH OF WORKERS IN THE CUTTING AND SEWING
DEPARTMENTS OF A SELECTED GARMENT FACTORY IN SRI
LANKA- A CASE STUDY**

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Fabric is the main raw material used in garments. During the fabric manufacturing process various types of chemicals are used. Some chemicals are used to produce fibers and some are used in subsequent processes like bleaching, scouring, finishing, coloration, etc. As per the previous research studies done in other countries, the workers in garment manufacturing organizations are exposed to airborne natural fiber particles as well as synthetic fiber particles, which are present in the working environment. Some of these particles are harmful to the health of the workers. Though garment manufacturing is the biggest manufacturing industry in Sri Lanka for the last few decades, little research has been carried out so far to evaluate the quality of the working environments inside these manufacturing organizations. The main objective of the research was to find out the presence of fabric dust and its impact on the health of the workers in the cutting and sewing departments of a selected garment factory.

At the initial stage of the research, a questionnaire was designed to check how the workers in the cutting and sewing departments felt about the presence of fabric dust in the working environment and how they felt about its effects on their health. For the survey, 80 out of 800 and 20 out of 100 workers were selected from the sewing and cutting departments respectively. The random sampling technique was used for the selection of workers. To find out the effect of fabric dust on the health of the workers, dust samples were collected at various locations of the cutting and sewing departments for testing purposes. They were examined using the X-Ray Florescence (XRF) technique, Fourier Transform Infrared (FTIR) Spectroscopy, Particle size analysis and Microbiological analysis. As per the results of the questionnaire survey, seventy-one (71%) percent of the workers who participated in the survey believed that the fabric dust in the working area is a problem and it influences their health. According to the XRF results, Z, K, Ca, Ti, Fe and Zn were present in the tested dust samples. As Zn could have been a coordinating material in textile chemical processing, it can be considered a significant factor in the health of the workers. As per results of the Fourier Transform Infrared (FTIR) Spectroscopic analysis, functional groups C=O, C=C, C=N, C-C, C-N or C-O are present in the dust samples. These findings could be used to establish the molecular structure of chemical compounds in the tested dust samples. As per the results of the particle size analysis, the particle sizes ranged from 200 nm to 600 nm (0.2 μm to 0.6 μm). This range belongs to the category of small particles (less than 1 μm). The range also belongs to the category of respirable dust (less than 5 μm). They can also penetrate deep into the lungs, therefore they are generally hazardous to human

health. As per the results of the Microbiological analysis, the concentration of the Aerobic colony and mould counts were also very high. These could be harmful to the workers. With the results of this research, it can be concluded that the fabric dust in the selected garment manufacturing organization has an impact on the health of the workers. Further studies should be carried out to better identify the relationship between fabric dust and the health of the workers.

Keywords: Fabric dust, Particle size, Microbial analysis, Aerobic colony count, mould count

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