

Correlation of body dimensions with office chair

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ABSTRACT

This study was conducted on a randomly selected sample of two hundred male and female workers in Marathwada Agricultural University, Parbhani (Maharashtra) office invariably using office chair. Maximum body breadth measurements were positively correlated with chair dimensions. This may result in discomfort while using chair. Sitting height, knee height and popliteal height had highly positive correlation with chair dimension. Thigh height, eye height, shoulder height had non significant correlation. Non of the chairs fulfilled the need of respondents because in same chair height of chair was good in other chair seat height was comfortable and it was observed that in many chairs arm height and chair breadth were comfortable.

Key words : Anthropometry, Office chair, Ergonomics, Ergonomics chair, Sitting posture

The basic requirements for sitting is to provide stable support for the body that is comfortable over a period of time which allows the users to change position easily without losing the support. It must also be appropriate to the task or activity which is to be performed and suit the height of the work surface.

It has been noticed that the lack of adequate knowledge on account of human facilities, other limitations and the cost effectiveness of the utility of human resources have led man-made designs of daily usable commodities and work spaces as unusable for the users. This dearth has greatly decreased human efficiency, performance, operations smoothness, etc. causing dissatisfaction and thereby adversely affecting the acceptance of the design by the common users. Man with his structural, physiological and behavioural limitations should be considered when designing.

In most offices, the workstation consists primarily of a chair and a work surface. The primary factors, which play important roles, are the specific job tasks, body size and equipment. The most aspects to be considered will be the design and size of the chair, and the height and design of the workstation. The types of equipments used by the worker will largely affect the design.

Prolonged and repetitive motions and excessive force can cause muscle and joint problems. The parts of the body that office work most often affects the back, arms, wrists, hands, neck and shoulders. Back problems can occur when workers use poorly adjusted chairs and workstations and spend long periods working in one position. If there is no proper relation of anthropometry and dimensions of chair, it will create health problem to worker.

METHODOLOGY

This study was conducted on a randomly selected sample of two hundred male and female workers in MAU office invariably using chairs. The anthropometric measurements (sitting and breadth measurement) of the selected respondents were recorded. The dimensions of the office chair were recorded for working out the user suitability. The physical problems of the office chair were studied. The data thus collected were classified, tabulated and analyzed by working out percentiles and correlation.

RESULTS AND DISCUSSION

Table 1 explains the correlation between anthropometric measurements and chair dimensions. It is observed from the results that sitting height had positive significant correlation with chair height ($r=0.64^{**}$), seat height ($r=0.84^{**}$) back rest of chair ($r=0.54^{**}$), arm height ($r=0.35^{**}$) and chair breadth ($r=0.58^{**}$) where as thigh height had highly positive significant correlation with seat height of chair (0.77^{**}) and non significant for all other dimensions of chair.

Elbow height was negatively correlated with chair height ($r=-0.14^*$), seat height ($r=-0.20^{**}$) and back rest of chair ($r=-0.15^*$). Non-significant results were noted for arm height and chair breadth.

Eye height and shoulder height were not significantly correlated with all the parameters of chair.

Knee height was positively correlated with chair height (0.83^{**}), seat height ($r=0.81^{**}$) arm height ($r=0.65^{**}$) and chair breadth ($r=0.87^{**}$)

The popliteal height of workers was positively correlated with back rest ($r=0.81^{**}$), arm height ($r=0.68^{**}$) and for chair breadth ($r=0.87^{**}$).