

## **Anthropometric measurements of the human feet and its relationship to women's shoes design**

**Prof / Nadia Mahmoud Khalil**

Head of the Department of Leather Industries, Faculty of Home Economics - Helwan University

**Prof. Dr. Ahmed Waheed Mostafa**

Department of Mineral and Ornamental Products, Faculty of Applied Arts - Helwan University

**Prof. / Salam Mohamed El-Hafiz**

Head of the Department of Biomechanics, Faculty of Physical Therapy - Cairo University

**Dr. Sanaa Mohamed Fathy**

Lecturer, Department of Leather Industries, Faculty of Home Economics - Helwan University

Summary :

Anthropometric measurements are one of the important means in assessing the growth of the individual, as they have a close relationship with many vital fields and are the most important factors as an essential indicator to know the extent of their relationship with different motor skills. Anthropometric science assumes that there are differences between humans not only in the measurement of the body but also in proportions Its different parts into one another, which complicates the problem of those workers in designing products. The research aims to study the anthropometric measurements of the human feet of women and the correct way to measure them because it has the greatest impact on the design of women's shoes on a correct scientific basis.

The research dealt with conducting anthropometric measurements of foot on a sample consisting of 100 students from the Faculty of Home Economics, Helwan University, and their age group ranges from the age of (18:21) years, and from a number of the governorates of the Arab Republic of Egypt (Cairo - Giza - Alexandria - Menoufia - Minya - Qalubia - Sharqia) with the aim of reaching averages of measurements of the dimensions of the human foot, in addition to the anatomical ratios of movement points in the foot for use in the applied study of shoe design, along with the design and production of a set of leather shoes for women, explaining modern scientific methods used in design according to Measurements anthropometric foot movement and points out, as well as a test comfort during wear "tiles" to make sure the matching models implemented for measurements anthropometric foot and achieve comfort element during wear and movement.

One of the most important findings of the research is the presence of correlational relationships with positive statistically significant signs between each of the measurements of the lengths of the foot with each other, and they are strong relationships at the level of significance of 0.01, which is (Height - foot length - foot length from the outside - foot length from the inside - length to the medial heel - length to the lateral heel - foot width - heel width), as well as having positive correlational relationships between each of the ocean measurements of the foot With each other, and they are strong relationships at the significance level of 0,01, namely (the circumference of the heels - the circumference of the instep - the circumference of the mid-foot - the circumference of the ankle - the circumference of the heel), and reaching ratios of measurements between the averages of the human foot measurements of the research sample with the aim of reaching a design It takes into account all the anatomical points of the foot and the most important movement points in their correct locations with reluctance ratios Boot to achieve quality in design, comfort in dressing.

**Keywords:**

Measurements, Anthropometric, Feet, Design, women's shoes.