Effect of some comfort properties on performance properties of sports abaya fabrics for women

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Abstract

Sports have received great attention in the Kingdom of Saudi Arabia's vision 2030, as it was stated that the government will support sports of all kinds, and expand opportunities associated with this trend. As a result, Saudi women have increased their interest in outdoor sports activities, which has led to a growth in the production of the sports *abaya*. A sports *abaya* is worn over daily clothes while outdoor-exercising. The presence of multi-layers of clothing negatively affects the fabric's air permeability. Therefore, fabrics used in sports *abaya* must be highly air permeable, to allow the transference of heat and moisture from the skin surface to the environment. The present study aims to investigate the effect of structural properties and porosity on the air permeability of the sports *abaya* fabrics. Two variable samples of fabrics (100% knitted cotton -white, 100% woven polyester -white) and two fixed samples (100% knitted cotton -black, 100% knitted polyester -orange) were used in producing and testing two models of sports *abayas*, with solo variable between the models. It was found from the results that, through a comparison between the variable samples, 100% woven polyester-white recorded a better air permeability value of 44.9 ml/cm^2/s, and porosity of 109.23 pixels / mμ^2, than 100% knitted cotton-white. This is due to the fact that the 100% woven polyester fabric has a higher porosity, and is made of fine polyester yarn. The results confirm that the use of 100% woven polyester-white fabric in producing sports *abaya* will provide greater comfort for the wearer for his ability to transfer heat and moisture well in terms of air permeability. Therefore, sports *abaya* model, which contained a 100% woven polyester fabric sample, was superior to the sport *abaya* model that contained 100% knitted cotton fabric in the level of air permeability**.** The results of the current study confirmed the existence of a direct-proportion relationship between the fabric's air permeability and its porosity, and an inverse relationship with some structural properties. The study also found out that the use of net fabric in the production of the sports *abaya* will greatly improve comfort in wearing, due to its high air permeability.

Keywords:

Thermal comfort, Air permeability, Physical properties, Porosity.

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