

UNIVERSITI TEKNOLOGI MARA

**PREDICTION OF SELECTED
CLOTHING COMFORT
PERFORMANCE USING FABRIC
PHYSICAL PROPERTIES**

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ABSTRACT

Comfort properties of fabric plays an important role in attribution to consumers' desirability on clothing products. In this study, the relationship between clothing comfort and fabric physical properties were investigated on non-sensorial and sensorial comfort properties of the knitted fabric. This includes moisture management transport properties, water vapour permeability, air permeability, fabric stiffness, crease recovery angle and surface friction of the fabric. An alternative way to improve comfort properties of the knitted fabrics was produced. Prediction of the selected clothing comfort was developed based on physical properties of knitted fabrics. The comfort parameters of ten different types of fabric that are available in market were evaluated. The evaluations were done by testing non-sensorial and sensorial comfort properties of the knitted fabric mentioned. The clothing comfort can be predicted with regression models produced by using basic physical properties of the fabric and nine models produced are valid. Seven models were selected for comparison between experimental and predicted results based on the goodness model fit ($R^2 \geq 0.5$). Six models have good correlation results between the experimental and predicted results. It shows that predicted results from models have good relationship with the experimental results which includes air permeability, crease recovery angle (course), bending length (course and wale) and flexural rigidity (course and wale).

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TABLE OF CONTENTS

	Page
CONFIRMATION BY PANEL OF EXAMINERS	ii
AUTHOR'S DECLARATION	iii
ABSTRACT	iv
ACKNOWLEDGEMENT	v
TABLE OF CONTENTS	vi
LIST OF TABLES	ix
LIST OF FIGURES	x
LIST OF ABBREVIATIONS	xi
CHAPTER ONE INTRODUCTION	1
1.1 Background of Study	1
1.2 Problem Statement	2
1.3 Objectives of Study	3
1.4 Scope and Limitation	3
1.5 Significance of Study	4
CHAPTER TWO LITERATURE REVIEW	5
2.1 Overview of Clothing Comfort	5
2.2 Human Physiological Anatomy and Comfort	6
2.2.1 Physiological interpretation	7
2.2.2 Heat Balance	8
2.2.3 Adaptation	10
2.3 Managing Clothing Comfort	11
2.3.1 Non-Sensorial Comforts	11
2.3.2 Sensorial Comforts	16
2.4 Prediction of Comfort	19
2.5 Summary	23

CHAPTER ONE

INTRODUCTION

1.1 Background of Study

Comfort commonly known to people as a condition state where they would prefer to stay in. It is asserted that comfort have to be expounded inside the whole idea of human physiological and psychological responses as it is not solely just a function of the physical properties of materials and clothing variables [1]. Individual presumption that affects our decision about comfort is based on the gathered individual experiences therefore it is also need to be considered. In this study, the relationship between knitted fabric physical properties and comfort properties of the knitted fabric is determined. Fabric physical properties that are correlated with comfort properties of the knitted fabric have higher chances to become predictors for comfort properties. Principally, comfort is the result of the integration of both individual assumption and measurable characteristics [2]. By other means, comfort is the integration of subjective and objective evaluation. However, clothing comfort is also interpreted as a pleasant state of the interaction of the physiological, psychological, and physical harmony between a human being and the surrounding atmosphere [3, 4]. This means it has to be in balance and cannot outweigh the other.

In recent years, the awareness in the advancement and the utilization of knitted fabrics are spreading. This is due to the straightforward manufacturing process that provides notable comfort level with an extensive product assortment. Most of the weft knitted products are used to make garments such as outer wears, dresses, inner wears, upholstery and draperies. Knitted fabrics are expected to have different standards and with varied comfort levels. This is owing to the fact that different use of machine with diverse specification are able to produce an extensive range of fabric types and structures. Correspondingly, comfort is the key maker or decisive factor for consumer and not solely rely on end product styles and durability granted that the competitive rivalries in textile market. These days knitted fabrics are considered to be ideal to consumer due to its excellent ability in elasticity and recovery especially in a transverse direction [5]. Beyond everything, consumer feel contented with the knitted fabric