

UNIVERSITI TEKNOLOGI MARA

**DEVELOPMENT OF A NEW
QUESTIONNAIRE-BASED
PAEDIATRIC EYE SCREENING
TOOL**

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ABSTRACT

Offering a comprehensive paediatric eye care is a major challenge in eyecare system globally. Many children worldwide are deprived of eye health care accessibility due to issues such as cost, labour, and time factors. Therefore, it is essential to stipulate alternative screening programs for the paediatric population. The objective of this study was to develop a new questionnaire-based paediatric eye screening tool. The items in the new questionnaire were constructed based on systematic extraction from the literature review, followed by items review by the expert groups. Four explorations were conducted to formulate the development of the questionnaire to fill in missing gaps that were unavailable from the literature review including (1) a survey on parental role in paediatric preventive eyecare to support proxy-administration approach; (2) classification of items into four vision clusters to assess the comprehensiveness of the existing items in a focus group study; (3) evaluation on parental response towards open-ended and close-ended question to determine investigation tactic; and (4) evaluation on characteristics of pictures to assist textual ambiguity. The development stage was divided into product development and piloting of the questionnaire. The piloting assessed the content, testability, reliability and validity of the questionnaire. A new 3-version of a proxy-reporting paediatric eye screening questionnaire (PRePESQ) was developed according to the age groups for Newborn-Infant (PRePESQ-NI), Toddler-Preschooler (PRePESQ-TP), and School-aged-Adolescent (PRePESQ-SA) based on the framework to cover four vision clusters (Physical, physiological, perceptual, and ocular health). The PRePESQ-NI consists of 12 items, while the PRePESQ-TP and PRePESQ-SA consist of 30 items. The survey findings attested to the parental role in low participation in paediatric preventive eye care. Items in existing paediatric eyecare questionnaires covered four vision clusters. Poor agreement was revealed among experts in classifying items into four vision clusters. Close-ended question approach was found to improve parental response towards issues related to their child's eye health. Variations in responses between wording and physical sign picture in designing questionnaire were apparent. All respondents (100%) were able to self-complete the questionnaires in less than 10 minutes. All items in the three version questionnaires had satisfactory content evidence with an Item-Content Validity Index (I-CVI) scores of >0.80 for all questionnaires. All questionnaires were found to have high internal consistency reliability (Cronbach's α : >0.7) and high test-retest reliability (ICC: >0.9). The PRePESQ showed high sensitivity and specificity for PRePESQ-NI (Sensitivity: 95.4%, specificity: 92.6%), PRePESQ-TP (Sensitivity: 96.3%, specificity: 88.2%) and PRePESQ-SA (Sensitivity: 95.0%, specificity: 87.5%) to support the concurrent validity. The PRePESQ questionnaires demonstrated high testability, reliability, and validity to support the potential utility in paediatric preventive eyecare. This thesis has provided a deeper insight into the potential of questionnaire-based eye screening in paediatric population. The conceptual basis can form the fundamental structure for future exploration. Further assessment using a larger sample size might be needed prior to recommendation for implementation in the clinical practice.

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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 | x |
| LIST OF FIGURES | xiii |
| LIST OF ABBREVIATIONS | xiv |
| | |
| CHAPTER 1: INTRODUCTION | 1 |
| 1.1 Overview of Paediatric Eye Care in the Healthcare System | 1 |
| 1.2 Magnitude of Vision Problems Among Paediatric Population | 5 |
| 1.3 Problem Statements | 7 |
| 1.4 Gaps in Knowledge Area | 9 |
| 1.5 Objectives of the Thesis | 11 |
| 1.6 Outlining the Structure of the Thesis | 13 |
| 1.7 The Significance of the Thesis | 13 |
| | |
| CHAPTER 2: LITERATURE REVIEW | 14 |
| 2.1 The Evolution of Vision Screening for Children | 14 |
| 2.2 Variation in Implementation of Paediatric Vision Screening Program | 17 |
| 2.2.1 Economic Status of a Country Influenced the Paediatric Vision Screening Implementation | 24 |
| 2.2.2 Limitation of Existing Screening Methods in Real Setting | 26 |
| 2.2.3 Competency of Non-eyecare Professional Screener | 28 |
| 2.3 Characteristics of Vision-related Questionnaire for Paediatric Eyecare | 33 |

CHAPTER 1

INTRODUCTION

1.1 Overview of Paediatric Eye Care in the Healthcare System

According to the World Health Organization (WHO), a health system (HS) "consists of all organisations, people and actions whose primary intent is to promote, restore or maintain health" (Roncarolo et al., 2017). The healthcare system comprises four main components: prevention, diagnosis, treatment, and rehabilitation. The current research on healthcare services aims to improve the performance and responsiveness towards population health needs by adapting to medical advances and adopting technological innovation (Roncarolo et al., 2017). Globally, the current healthcare system faces challenges in service delivery that mainly link to governance, leadership and resource issues (Roncarolo et al., 2017).

Health prevention program acts as the first line in healthcare that involves actions to reduce or eliminate exposure to risks that might increase the chances for an individual to suffer disease, disability, or premature death (Bonita et al., 2006). Health prevention programs have been implemented by government-funded or non-government organisations (NGOs) worldwide. Establishing a health prevention program should be based on daily practice. The program offered should provide an adequate mechanism to monitor, maintain and improve the quality of services (UK National Screening Committee, 1998). To satisfactorily plan and develop a preventive healthcare program, a proper understanding on the concept of healthcare prevention in clinical epidemiology is highly beneficial.

Epidemiology is a study of frequency, distribution and determinants of diseases and other health-related conditions in a population and prevention and control of the health condition (Bonita et al., 2006). According to the epidemiology concept, there are three levels of prevention approach (Bonita et al., 2006). The first level of prevention aims to either reduce the disease by eliminating the cause or increase resistance to disease or health conditions. Primary prevention program activities include health promotion, preventive exposure to factors that may cause diseases such as clean water supply and preventative disease measures after exposure to a risk factor such as vaccination program (Bonita et al., 2006). The second level of prevention aims to stop