UNIVERSITI TEKNOLOGI MARA

DEVELOPMENT AND VALIDATION OF ENERGY BALANCE AND PHYSICAL ACTIVITY

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ABSTRACT

Background: The growing incidence of sedentary lifestyles and imbalanced diets has led to a worldwide rise in chronic health conditions such as obesity and non-communicable diseases (NCDs). An infographic within the educational module can facilitate nutrition education on effective strategies for managing energy intake and expenditure, as well as promoting physical activity. **Objective:** This study aimed to develop and evaluate educational modules in terms of understandability, actionability, and suitability for educating young adults about energy balance and physical activity. **Methods:** This study employed descriptive analysis, which involved three distinct phases: (I) content analysis, (II) design and developing an educational module, and (III) module evaluation. A panel of seven healthcare professionals specializing in medicine, dietetics, physical education, and language evaluated the visual story of the educational module using the Patient Education Materials Assessment Tool for printable material (PEMAT-P), Suitability Assessment of Materials (SAM), and Educational Content Validation Instrument in Health (ECVIH). The evaluation of educational module focused on understandability, actionability, and suitability. **Results:** The educational modules comprised a total of 28 pages, covering key aspects of energy balance and physical activity for young adults. The information was developed using the Malaysian Dietary Guidelines and the current article. The infographic was created using the Canva tool. The utilization of Bahasa Melayu was selected in order to ensure accessibility for the intended audience. The educational module achieved a 93.3% score for understandability, 98.0% for actionability, and 80.8% for suitability. The overall score for content validity index rating is 100.0%. **Conclusion:** The developed educational module earned high ratings in terms of understandability, actionability, and suitability, indicating healthcare professionals responded positively to the visual infographics. The result indicates that utilizing visual story infographics could effectively enhance education on energy balance and physical activity in young adult.

Keywords: Energy Balance, Physical Activity, Education Module, Young Adult, Infographic

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CHAPTER 1: INTRODUCTION

1.1 Research Background

In the contemporary society, the prevalence of sedentary lifestyles and imbalanced dietary practices has led to a significant increase in chronic health conditions among adults worldwide. Sedentary behaviors are becoming a significant public health concern globally, associated with a range of non-communicable diseases (NCDs) such as obesity, hypertension, type 2 diabetes, cardiovascular disease, certain cancers, mental health disorders, and even early death (Xu et al., 2022). Sedentary lifestyle is defined as either sitting, lying down, or reclining while awake over than 2 hours a day (NHMS, 2023). The term 'Sedentary Death Syndrome' (SeDS) has been coined to describe this alarming phenomenon, which is a condition characterized as a cause of death that is directly linked to a lack of physical activity (Gillette, 2023). Approximately 69% of total deaths annually in Central Asia, Europe, and America are attributed to chronic diseases due to SeDS (Katzmarzyk et al., 2022). The prevalence of sedentary behaviour among adults in Malaysia is 49.9%, which is greater than other Asian countries including Hong Kong, India, and China, as evidenced by the National Health and Morbidity Survey (NHMS) 2023.

Dietary imbalance refers to an excessive or inadequate intake of specific dietary components, such as proteins, fats, carbohydrates, fibers, vitamins, and minerals (Márquez Álvarez et al., 2024). According to Public Health Malaysia (2022), about 95% of adults in Malaysia are found to have inadequate vegetables and fruit, as recommended by the Ministry of Health Malaysia to consume three servings of vegetable and two servings of fruit every day, which is one of the factors in the occurrence of malnutrition. Malnutrition, which can manifest as undernutrition or overnutrition, can further complicate the negative health effects of sedentary behavior (Jezewska-Zychowicz et al., 2018). Globally, there are over 2.5 billion and 890 million adults who are overweight or obese, in contrast to only 390 million people who are underweight (WHO, 2024). The incidence of overweight and obesity among adults in Malaysia is significantly greater, with a prevalence rate of 54.4%, compared to the