

UNIVERSITI TEKNOLOGI MARA

**THE EFFECTS OF DRD2/ANKK GENE POLYMORPHISMS RELATED TO
FOOD DESIRE ON MENTAL HEALTH, EATING BEHAVIOR, AND PHYSICAL
ACTIVITY LEVELS IN THE “FIT FOR FUTURE” WEIGHT MANAGEMENT
PROGRAM**

NUR FARAH HANNA BINTI ABDUL HAFIZ

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Faculty of Health Sciences

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ABSTRACT

The National Health and Morbidity Survey (NHMS) reported that Malaysia has a high prevalence of overweight and obesity, which has increased from 44.5% in 2011 to 54.4% in 2023 among adults. Factors that may contribute to obesity in Malaysia are genetics, mental health disorders, eating behavior and activity participation. Studies stated that DRD2/ANKK1 may be associated with the increase in obesity due to its role in rewarding and reinforcement mechanisms that make the person feel motivated and addicted (Hernández & Jiménez-Rodríguez, 2024). This study aims to determine how the DRD2 gene influences dietary intake, physical activity and mental health in individuals with a genetic predisposition to obesity. The study includes three phases, which are phase 1 (pre-assessment), phase 2 (intervention), and phase 3 (post-assessment). The assessment must be completed, including questionnaires, anthropometric measurements, and blood collection during phases 1 and 3. As the data were not normally distributed, non-parametric tests (Wilcoxon Signed-Rank and Mann–Whitney U tests) were employed. It showed reductions in energy and macronutrient intake (23.0% in energy, 24.5% in carbohydrate, 17.8% in protein and 24.4% in fat), pre and post, which demonstrated the intervention's positive effect. Yet there was no statistically significant association between ANKK1 genotype and physical activity. A key limitation was a 60% dropout rate from the planned 200 to 80 subjects, reducing the power of genetic association tests. Despite these constraints, the study presents preliminary evidence of gene–lifestyle interaction and highlights the importance of repeated measurement and adequate sample size in behaviour-genetic studies in the future.

Keywords: DRD2/ANKK1, obesity, dietary, physical activity, intervention

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CHAPTER ONE

INTRODUCTION

1.1 Introduction

1.1.1 Overview

Obesity has become a global health crisis, which causes high rates of people having diseases such as diabetes and cardiovascular diseases. According to the World Health Organization (WHO) 2019, overweight Asians when are those with a body mass index (BMI) of 23-24.9 kg/m² and obese when equal to or more than 25 kg/m². Based on the study, Malaysia has become one of the Asian countries with a high overweight population (Lim et al., 2020). According to the National Health and Morbidity Survey (NHMS) report, the high prevalence of overweight and obesity among Malaysian adults has increased from 44.5% in 2011 to 54.4% in 2023. In becoming obese there are a lot of factors that may contribute to the issue, including genetics, mental health disorders, eating behaviour, and physical activity levels. The DRD2 gene gives reward and reinforcement mechanisms that make the person feel motivated, pleased, and addicted (Hernández & Jiménez-Rodríguez, 2024). However, numerous studies stated that low D2 receptor levels may be related to various obesity-related factors independent of BMI, such as emotional eating and reduced physical activity (Montalbana et al., 2023).

The study is essential because there is no evidence of a genetic factor influencing eating behaviour and increasing the risk of obesity (Lim et al., 2020). Based on past research, most participants are Chinese, representing only part of Malaysia's population, while the majority are Malay. Also, it is essential to involve many races and ethics populations in Malaysia in order to provide intensive information about their differences in eating habits and preferences. Moreover, research on the effect of DRD2/ANKK1 gene polymorphism influencing mental health (depression, stress, and anxiety), eating behaviour and physical activity level remains limited and poorly explored, especially in