

UNIVERSITI TEKNOLOGI MARA

**THE INFLUENCE OF DIETARY INTAKE, MENTAL HEALTH,
AND PHYSICAL ACTIVITY ON BLOOD GLUCOSE LEVELS
AMONG ADULTS IN WEIGHT MANAGEMENT PROGRAM**

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Bachelor (Hons.) of Dietetics

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JULY 2025

ACKNOWLEDGEMENT

First and foremost, I would like to express my deepest gratitude to my *Creator*, my *Lord*, the Most Merciful and the Most Gracious, *Allah SWT*, for making it possible for me to complete this thesis, and for showing me that there is always light at the end of every tunnel. He has taught me the importance of *Sabr* in every situation, even in moments of deep doubt.

I would like to sincerely thank my supervisor, Professor Dr. Norazmir Md Nor, for his invaluable support, encouragement, and constructive guidance throughout this entire journey. I truly could not have asked for a better supervisor.

To *Umi*, my ultimate supporter and best friend. You have shown me gentle acts of kindness countless times, often without even realizing how much they encouraged me to keep going. Thank you for your endless prayers, which I needed more than anything. Thank you for being on my side and understanding me in ways no one else can. I am forever thankful and blessed to have you as my mother. To *Abah*, my first hero in life. I will always be your little princess. I am so grateful for everything you have done for me. Your notifications always seem to appear exactly when I am struggling; it is as if you always know when your daughter is having a hard day. Your presence has been a constant source of strength through all the ups and downs.

To all my amazing friends, especially *Cro15sant*, thank you for giving me the best three years of memories and experiences throughout this degree journey. We have all done our best, and I sincerely wish each of you success and happiness in your future endeavors. To my dearest roommate, Dina, you have seen the worst of me, and I truly hope that won't ever change our friendship. Thank you for listening to my endless rants with so much patience and understanding, and for staying by my side even when things got tough. People may come and go, but I hope we stay friends until we grow old. To my other lovely friends, I may not say it often, but I know exactly who you are, and I am deeply grateful for the friends I have in my life right now. I am beyond lucky to have each of you, and I hope you always know just how much you all mean to me. Also, special thanks to my teammates Farah, Diyan, and Rudiah for not giving up on this journey together and for all the hard work you poured into this project.

While I would never have made it through this degree without my friends and family, I also want to thank myself and give myself a big hug. For never giving up. For pushing through every time I wanted to quit. I may not have been the most stellar student, but I will always put in the effort to reach my goals, and that is more than enough for me.

At the end of the day, this is for me.

This is for *Alia Batrisha*,

for the countless sleepless nights, the tears no one saw, the mental breakdowns, the pain of losing someone you love, the growing distance from friends, the quiet victories, and the moments of strength that came even when I felt weakest.

And this marks the end of two semesters' worth of blood, sweat, and tears.

ABSTRACT

Type 2 diabetes mellitus (T2DM) is a growing global and national health concern often linked with poor dietary intake, physical inactivity, and psychological stress. This study aimed to investigate the impact of dietary intake, mental health status, and physical activity on fasting blood glucose levels in overweight and obese adults participating in the Fit for Future weight management program. A total of 80 participants were recruited and classified into four groups: Normal Control, Normal Intervention, Obese Control, and Obese Intervention. Data on dietary intake were collected using the Food Frequency Questionnaire (FFQ), mental health status was assessed using the Depression, Anxiety, and Stress Scale (DASS-21), and physical activity levels were evaluated using the International Physical Activity Questionnaire (IPAQ). Fasting blood glucose (FBG) levels were measured both before and after the intervention. The Wilcoxon Signed-Rank and Mann-Whitney U tests were used for data analysis. The findings showed that both intervention groups at post-intervention showed a significant improvement in dietary intake and physical activity levels. The Obese Intervention groups showed significant reductions in anxiety and depression scores ($p < 0.05$), while the Normal Intervention group showed a significant reduction in FBG levels ($p = 0.02$). No significant changes were observed in the control groups. These results suggest that integrative lifestyle interventions addressing diet, mental health, and physical activity can positively influence metabolic outcomes. The study highlights the importance of a holistic approach in managing metabolic health in a weight management program.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Over the past few decades, diabetes mellitus (DM) has emerged as a major global health concern, with its prevalence rising steadily. DM is categorized into type 1 (T1DM), type 2 (T2DM), and gestational diabetes (GDM). Among these, T2DM is the most common, affecting around 90 – 95% of people diagnosed with DM (Goyal et al., 2025). It is primarily associated with insulin resistance and relative insulin deficiency, while T1DM results from autoimmune destruction of pancreatic beta cells, causing absolute insulin deficiency. The increasing global in T2DM is strongly associated with changes in lifestyle, rapid urbanization, and socioeconomic development (Sung & Lee, 2025). The World Health Organization (WHO) reported that the number of individuals living with DM increased from 200 million in 1990 to 830 million in 2022, highlighting the severity of this growing epidemic.

Sedentary behaviours and poor eating habits frequently lead to weight gain and obesity, which significantly raises the risk of developing T2DM (Moschonis & Trakman, 2023). Both conditions can also affect mental health as the stress of managing chronic illness and dealing with obesity-related complications often results in increased levels of depression, anxiety, and stress (Beltrán-Carrillo et al., 2022). These psychological issues may further impair blood glucose regulation and adherence to lifestyle interventions, creating a vicious cycle that complicates disease management. Fasting blood glucose (FBG) is an important clinical measure that reflects an individual's ability to maintain blood sugar balance in the absence of food. Moreover, monitoring FBG is essential to detect early signs of metabolic issues and prevent complications related to diabetes.

Participants in weight management programs face multiple challenges affecting blood glucose levels. While most interventions focus on diet and physical activity, mental health is often neglected despite its significant impact on metabolism