

UNIVERSITI TEKNOLOGI MARA

**NUTRITION TRANSITION AND ITS
ASSOCIATION WITH OBESITY IN
MALAYSIA ADULTS FROM 2003 TO
2014**

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PhD

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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

Monitoring changes in energy and nutrient intakes of the population over the course of time is essential to help healthcare providers develop effective dietary policies. This study was aimed at examining the extent of under-reporting of energy intake and its related characteristics among respondents in the Malaysian Adult Nutrition Survey (MANS) 2003 and MANS 2014. Then, to assess changes in nutrient intake and Recommended Nutrient Intake (RNI) 2017 achievements by using data obtained from MANS carried out in 2003 and 2014. Finally, this study aimed to determine the relationship between dietary pattern and body mass index (BMI) in MANS 2014 sample. The present study analysed energy intakes of 9,624 adults aged 18-59 years from the MANS in year 2014 and 2003 using a single 24-hour diet recall. In both surveys, under-reporting increased with higher BMI and older age groups. It was higher among women than men, lowest among those with primary schooling or below, and those living in Peninsular Malaysia. It was higher among rural respondents in 2014 but higher among urban respondents in 2003. The intake of energy and micronutrients increased when under-reporters were excluded. After mis-reporting of energy intake was taken into account, dietary data from MANS 2003 and 2014, which involved a total of 4,044 randomly selected respondents were obtained. Proportions of calories derived from macronutrients were within the recommendations for a healthy diet. Consumption of protein, fat, calcium, iron and vitamin A was significantly higher in 2014 than in 2003. Consumption of protein, iron, vitamin C, and vitamin A exceeded the RNIs in 2014. Signs of changing energy and nutrient intakes were found, including increases in protein and fat intakes since 2003, and decreased carbohydrates intakes. Pearson product-moment correlation coefficient concluded that total energy intake is correlated with an increase in BMI. This study also aims to determine the socio-demographic determinant of overweight and obesity among Malaysian adult. A total of 17,257 adults aged 18 years and older were assessed for BMI status, from NHMS survey conducted in 2011. The identified risk of overweight were Indian, aged 50-59 years, widower, respondents with secondary education, unpaid worker, and with high household income group. The identified risk of obesity were women, Indian, aged 30-39 years, widower, respondents with primary education, unpaid worker, and with middle household income group. As a conclusion, findings in this study indicate a high prevalence of overweight and obesity in the population. The magnitude of under-reporting tends to distort the relationship between energy intake and obesity. The findings have shown that, most dietary intakes have improved following the Malaysian dietary recommendations. There have been significant changes in sources of energy over the study period. This study has also revealed areas of concern: the consumption of carbohydrates has declined steadily while protein and fat intakes have increased. The findings above supported this study's hypothesis that an increase in total energy intake correlates with an increase in BMI. The result also suggests that the amount of energy consumed by respondents may determine their BMI group. There was a significant positive correlation between total carbohydrate, total fat, total sodium, total dietary fibre, total sugar intake and BMI. The results of this study highlighted the importance for nutrition surveillance of the population to be collected in shorter duration.

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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	xii
LIST OF ABBREVIATIONS	xiii
CHAPTER ONE: INTRODUCTION	1
1.1 Introduction	1
1.2 Statement of the Problem	3
1.3 Objectives of the Study	4
1.4 Hypotheses Null	4
1.5 Significance of the Study	5
1.6 Scope and Delimitation of the Study	6
1.7 Definition of Terms	6
CHAPTER TWO: LITERATURE REVIEW	8
2.1 Introduction	8
2.2 Demographic and Epidemiologic Transition	8
2.3 Nutrition Transition	10
2.4 Changes in Dietary Pattern	17
2.5 Obesity in Malaysia	19