# THE EXTENT OF PREVALENCE OF OBESITY AMONG FEMALE UNIVERSITY STUDENTS IN CAIRO

BY

MADEHA EL-SAYED ABDEL AAL

B.Sc.(Hon.)

Home Economics ( Nutrition )

Ein Shams Univ., 1978

THESIS

SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF



IN

HOME ECONOMICS (NUTRITION)

DEPARTEMENT OF NUTRITION AND FOOD CHEMISTRY

WOMEN'S COLLEGE

EIN SHAMS UNIVERSITY

1986



قالوا سبحانك لا علم لسا الا ما علمنا أنك أنت المسايم الحسكم مدق الله العظيم\*



# THE EXTENT OF PREVALENCE OF OBESITY AMONG FEMALE UNIVERSITY STUDENTS IN CAIRO

Thesis Advisors

Dr. SAAD K. SHEHAB.

Professor of Biochemistry

Department of Nutrition

Women's College, Ein Shams Univ.

Dr. NANCY N. GHALI.

Lecturer of Nutrition
at the same Department.

Dr. ASMA A. IBRAHIM.

Lecturer of Nutrition

at the same Department.

Many yhah...

Asma. Almed ....

The Authoress Passed the following courses:

- Advanced Biochemistry.
- Advanced Nutrition.
- Applied statistics.
- Microbiology.
- German Language.

Child Miles

#### APPROVAL SHEET

## THE EXTENT OF PREVALENCE OF OBESITY AMONG FEMAL UNIVERSITY STUDENTS IN CAIRO

Ву

Madeha El-Sayed Abel Aal

Thesis submitted for the M.Sc. Degree in Home Economics (Nutrition) has been approved by:

Dr. S. Willas

Dr. 11.216. 1.5.15

Dr.M. Elghora

(Committe in Charge)

Date: / / 1987

### ACKNOWLEDGEMENT

The author wishes to express her appreciation, and gratitude to her principal advisor Prof. Dr. SAAD K. SHEHAB, Professor of Biochemistry, Department of Nutrition and Food Chemistry, Women's College, Ein Shams University, and Dr. NANCY N. GHALI, Lecturer of Nutrition at the same Department for their kind supervision, Wise Planning of the Thesis, Constant guidance, advice, stimulating criticism, keen interest, continous encouragement many Valuable suggestions, cooparation and great help during the entire course of this study.

Sincere thanks and gratitude are also extended to Dr. ASMA A. IBRAHIM, Lecturer of Nutrition, at the Same Department, for her guidance advice and facilities offered throughout the fulfilment of this work.

Thanks are also due to all those who helped me by providing diet samples and useful data from faculties and hostels of Azhar, Cairo, Ein Shams and Helwan Universities.

Finally I would like to extend may thanks to all members of the Department of Nutrition and Food Chemistry, Wome's College, Ein Shams University and all those who have contributed in any way to make this study possible.

- i -

### CONTENTS

			<u>Page</u>
GENERAL INTRO	DUCTION		1
CHAPTER 1.:	REVIEW	OF LITERATURE :	5
1.1.	Bodywei	ght and body composition.	5
	1.1.1.	Weight norms.	5
	1.1.2.	Fluctuations of body weight.	/
	-a-	Changes in energy stores	7
	-b-	Changes in body water	9
	1.1.3.	Body composition.	11
	1.1.4.	Methods of measuring body composition	12
		body compsition by skinfold thickness	14
1.2.	Obesity		20
	1.2.1.	Defination of obesity.	20
	1.2.2.	Classification of types of obesity	22
	1.2.3.	Etiology of obesity.	23
	-a-	Genetic factors.	23
	-b-	Socio-economic factors.	25
	-c-	Psychological factors.	28
	-d-	Eating habits.	29
	-e-	Physical activity and environmental	
		factors.	31
	-f-	Endocrine factors.	33
	1.2.4.	Complications of obesity.	33
	1.2.5.	Prevention of obesity.	34

			Page
	-a-	In infants and children.	35
	-b-	In adolescents.	36
	~C-	In Adults.	37
	1.2.6.	Treatment of obesity.	37
	-a-	Fasting and diet regimens.	38
	-b-	Physical exercise and physical activity	. 40
	<del>-</del> c-	Other physical measures.	42
	-d-	Drugs.	42
	-e-	Surgical treatment.	44
1.3.	Food an	d energy intake.	45
	1.3.1.	Methods of measuring food intake.	45
	-a-	Estimation by recall.	46
	-b-	Food record.	47
	-c-	Weighed intake.	47
	-d-	Diet history.	48
	1.3.2.	Nutritive and caloric value of food	48
	1.3.3.	Average composition of the diet.	52
	1.3.4.	Recommended dietary allowances.	53
	-a-	Caloric allowances.	54
	-b-	Daily requirement of protein.	55
	-c-	Necessity of fat in the diet.	56
	-d-	Necessity of carbohydrates in the diet	. 58
	-e-	Iron requirement.	59
	-f-	Calcium requirement.	60

			Page
	1.3.5.	Regulation of food intake.	60
1.4.	Blood h	naemoglobin levels as an index of	
	nutriti	ional status.	62
CHAPTER 2.	EXPERIM	MENTAL; SUBJECTS AND METHODS.	66
2.1.	Subjects.		66
2.2.	Anthrop	pometric measurements of the subjects	66
	2.2.1.	Body weight.	67
	2.2.2.	Height.	67
	2.2.3.	Desirable weight for height.	67
	2.2.4.	Skinfold thickness and body fat content.	67
	-a-	Skinfold thickness.	67
	-b-	Body fat content.	68
2.3.	Estimation of dietary intake.		69
	2.3.1.	Estimation of amoutns of food intake	69
	2.3.2.	Nutritive and energy value of the diets.	70
	2.3.3.	Chemical analysis of the diets.	70
	-a-	Preparation of diet samples.	71
	-b-	Determination of moisture.	72
	-c-	Determination of total organic nitrogen	
		and crude protein.	72
	-d-	Determination of crude fat (etherextract)	73
	-e-	Determination of total carbohydrates	73
	- f-	Determination of galating and	7/

		Page
2.4.	Determination of blood haemoglobin	
	levels.	75
2.5.	The Socio-economic status of the students	76
2.6.	Numerical analysis and presentation of the	
	data.	76
CHAPTER 3.	: RESULTS AND DISCUSSION :	77
3.1.	General Characteristics of the sample.	77
3.2.	Anthropometric Measurements of the students.	81
	3.2.1. Height and Weight.	81
	3.2.2. Weight Deviation and Weight Categories	84
	3.2.3. Skinfold Thickness and Body Fat Content.	88
3.3.	The Food Intake of the Students.	95
3.4.	Socio-economic status of the students.	108
3.5.	Blood Haemoglobin levels of the Students.	112
3.6.	Characteristics of the Obese Students.	116
	3.6.1. General Characteristics	
	Age-Height-Weight.	119
	3.6.2. Skinfold Thickness and Body Fat Content	120
	3.6.3. Food Intake.	123
	3.6.4. Socio-economic Status.	128
	3.6.5. Blood Haemoglobin Levels	131

	Page
SUMMARY	133
CONCLUSION AND RECOMMENDATIONS	139
REFERENCES.	142
APPENDIX	175
ARABIC SUMMARY.	176

GENERAL INTRODUCTION

- 1 -

#### GENERAL INTRODUCTION

Good nutrition for people of all ages, for health maintenance as well as for restoration of health, is an economic, political, and humanitarian concern, Robinson (1977). Unfortunately, millions of people in the world suffer from some degree of malnutrition as a result of ignorance or poverity, or both. Various governments and scientific authorities make great efforts trying to improve the nutritional status of the population by providing nutritional survices and extending nutritional education and counseling programs.

Obesity is one of the most common nutritional disorders in present days especially in developed and fast developing countries, Passmore et al (1963) and Richards and de Casseres(1974) and it represents a serious health hazard. It's prevalence is increasing and it constitutes a major public health problem due to modern civilization and increasing urbanization, Whol (1964).

Obesity is the number-one nutritional problem in industrialized nations today due to the over accumalation of adipose tissue resulting from a prolonged positive energy balance Reed (1980). Depending on the criteria of diagnosis used, from a third to a half of the population in developed countries are obese, Office Of Health Economics (1969), Dwyer and Mayer (1970) and Powers (1980). However, obesity is more prevalent in developed than in indeveloped countries, Chrisatakis (1973) and Richards and de Casseres (1974).

- 2 -

The cost of obesity in terms of mortality and illhealth is well documented, Baird (1969), Robinson (1977), Powers (1980) and Reed (1980).

Obesity is also a physical handicap and obese people feel more uncomfortable during warm weather because of the thick layers of fat which work as an insulator and more effort must be expended by fat persons to do a given amount of work because of the increase in body mass. Because of their decreased agility, obese people are more susceptible to accidents. Fatigue, back-acke, and foot troubles are common complaints of the obese. However, excessive weight increases susceptibility to a number of diseases, such as gall bladder, gout, diabetes mellitus, renal disease, degenerative arthritis, hypertension arteriosclerosis and cardiovascular diseases, Davidson et al. (1979) and Hafen (1981).

Obesity may be considered to predispose to pulmonary emphysema and chronic bronchitis, since obesity is often associated with troubles in pulmonary ventilation. The hazards of surgery and of pregnancy and childbirth are multiplied in the presence of excessive adipose tissue, Whol (1964) and Robinson (1977).

Moreover, the cost in cash of obesity could be high. It could be as high as over £ 40 millions per year spent for example in Britain by obese people trying to get slim, Consumers' Association (1972) and the great majority of this money is wasted.