

**A study of the Relationship between
Anthropometric Measures, Blood
Gases, and Pulmonary Functions, in
a Random Sample of Adult Healthy
Egyptians**

Thesis

*Submitted for partial fulfillment of the master degree in Chest
Diseases*

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2013

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قَالُوا سُبْحَانَكَ لَا عِلْمَ لَنَا إِلَّا مَا
عَلَّمْتَنَا إِنَّكَ أَنْتَ الْعَلِيمُ الْحَكِيمُ

صدق الله العظيم

سورة البقرة آية (32)

Acknowledgement

*First and above all, my deepest gratitude and thanks to **Allah** for achieving any work in my life.*

*Words stand short when coming to express my deep gratitude and great thanks to **Prof. Sherif El Bouhy** Professor of Chest Diseases, Faculty of Medicine Ain Shams University for his continuous encouragement, sincere advice, and co-operation in all steps of this work.*

*I am deeply grateful to. **Dr. Gehan El Asaal** Ass.Prof of Chest Diseases, Faculty of Medicine Ain Shams University, who devoted her time, effort and experience to facilitate the production of this work.*

*Finally, I'd like to express my profound gratitude and deepest appreciation for my family specially my **Father** and **Mother**.*



Sherehan El Sayed Abdel Aaty

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List of Abbreviations

ABG	: Arterial blood gases.
ATS	: American thoracic society.
ATS-ERS	: American thoracic society- European respiratory society.
BE	: Base excess.
BMI	: Body mass index.
cm	: Centimeter.
°C	: Celsius.
CO ₂	: Carbon dioxide.
COPD	: Chronic obstructive pulmonary disease.
CT	: Coputed tomography.
DEC	: Decrease.
DLCO	: Diffusing capacity of the lung for carbon monoxid.
EDTA	: Ethylenediaminetetraacetic acid
e.g.	: For example
ERV	: Expiratory reserve volume.
FEF	: Forced expiratory flow.
FEF25%	: Forced expiratory flow at 25%
FEF25-75%	: Forced Expiratory Flow Between 25% and 75% of Forced Vital Capacity.
FEF50%	: Forced expiratory flow at 50%.
FEF75%	: Forced expiratory flow at 75%.
FEV1	: Forced expiratory volume in the first second.
FEV1/ FEV6:	Forced expiratory volume in the first second/ Forced expiratory volume in six seconds.
FEV1/FVC	: Forced expiratory volume in one second/Forced vital capacity.
FEV3	: Forced expiratory volume in three seconds.
FEV6	: Forced expiratory volume in six seconds.
FRC	: Functional residual capacity.
Ft	: Feet.

List of Abbreviations (Cont.)

FVC	: Forced vital capacity.
gm	: Gram.
H+	: Hydrogen ions.
H ₂ CO ₃	: Carbonic acid.
H ₂ O	: Water.
HCO ₃	: Bicarbonate.
HCO ₃ ⁻	: Bicarbonate ion.
HRCT	: High resolution computed tomography.
HS	: Highly significant.
IC	: Inspiratory capacity.
In	: Inch.
Inc	: Increase.
IRV	: Inspiratory reserve volume.
Kco	: Krogh constant
kg/m ²	: kilogram/ square meter.
kPa	: kilopascal.
L	: Liter.
L/min	: Liters/Minutes.
L/S	: Liters/Seconds.
LLN	: Lower limit of normal.
MDI	: Metered-dose inhaler.
MEP	: Maximal expiratory pressure.
mEq/L	: Milliequivalents per liter.
6MWK	: Six minute walk test.
MID	: Minimally important difference.
Min	: Minute
MIP	: Maximal inspiratory pressure.
ml	: Milliliter.
mm	: Millimeter.
mmHg	: Millimeter of mercury.

List of Abbreviations (Cont.)

mmol/l	: Millimoles per Liter.
MVV	: Maximal voluntary ventilation.
n	: Number.
NHANES III:	Third national health & nutrition examination survey
NHLBI	: National Heart, Lung, and Blood Institute
NIH	: National institute of health.
NLHEP	: National lung health education program.
Nor	: Normal.
NS	: Non significant.
O ₂	: Oxygen.
P(A-a)O ₂	: Alveolar to arterial oxygen gradient.
PaCO ₂	: Arterial carbon dioxide tension.
PaO ₂	: Arterial oxygen tension.
PCO ₂	: Carbon dioxide tension.
PEF	: Peak expiratory flow
PEFR	: Peak expiratory flow rate.
PFTs	: Pulmonary function tests.
pH	: Negative logarithm hydrogen ion.
PIF	: Peak inspiratory flow.
PO ₂	: Oxygen tension.
PvCO ₂	: Venous carbon dioxide tension.
PvO ₂	: Venous oxygen tension.
RV	: Residual volume.
S	: Significant.
sec	: Second.
SaO ₂	: Arterial oxygen saturation.
SBC	: Standardized bicarbonate.

List of Abbreviations (Cont.)

SPSS	:	Statistical package for Social Science
SD	:	Standard deviation.
So ₂	:	Oxygen saturation.
SvO ₂	:	Venous oxygen saturation.
TLC	:	Total lung capacity.
TV	:	Tidal volume.
units/ml	:	Units / Milliliter
+ve	:	Positive.
VC	:	Vital capacity.
-ve	:	Negative.
W/Ht	:	Waist/ height.
WC	:	Waist circumference.
WHO	:	World health organization.
WHR	:	Waist to hip ratio.
Y	:	Year.
1 st	:	First

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Introduction

Anthropometric measurements of human populations are considered basic information for the assessment of physical characteristics of individual within a given society. Anthropometry of the elderly, is a practical approach to evaluate their nutritional and health status, as well as Anthropometry of the adult sector is needed for biological and health aspect (*National Research Center, 2008*).

One of the anthropometric measures is Body Mass Index (BMI) which is a simple index of weight-for-height that is commonly used to classify underweight, overweight and obesity in adults (*WHO, 2006*). In addition, central obesity is measured by increase in waist circumference or waist-to-hip ratio (WHR) (*Montague & O'Rahilly, 2000*).

In Several studies that examined the relation between obesity and lung function used body mass index (BMI) as a measure of overall adiposity (*Maiolo et al., 2003*).

Obesity cause various effect on respiratory function in the form of alteration in the respiratory mechanics, decreased respiratory muscle strength, decrease in the pulmonary gas exchange and a limitation in the pulmonary function test. These changes in the lung function tests are due to the accumulation of adipose tissue in the abdominal cavity and the chest wall (*Costa et al., 2008*).