Peak expiratory flow rate (PEFR) in relation to body mass index (BMI) and waist circumference among police soliders

Thesis

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BY

Mohamed Gamal Abas

(M.B.B.CH)

SUPERVISED BY

Prof . Mohamed Sherif El Bouhy

Professor of chest diseases

Faculty of medicine

Ain Shams University

Dr . Nehad Mohamed Osman

Lecturer of chest diseases

Faculty of medicine

Ain Shams University

Faculty of medicine

Ain Shams University

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LIST OF ABBREVIATIONS

ATS	American Thoracic Society
BMI	Body mass index
BHR	Bronchial hyperresponsivness
COPD	Chronic obstructive pulmonary disease
CPAP	Continuous positive airway pressure
DEXA	Dual energy x-ray abspirometry
FEV١	Forced expiratory volume in first second
FEF	Forced expiratory flow
FVC	Forced vital capacity
HDL	High density lipoprotein
LH	Lateral hypothalmus
MVV	Maximal voluntary ventilation
NLHEP	National lung health and education programe
PFTs	Pulmonary function tests
PEFR	Peak expiratory flow rate
PCOS	Polycystic ovary syndrome
PD	Provocative dose
VMH	Vetromedial hypothalamus
RV	Residual volume
TLC	Total lung capacity

WC	Waist circumference
WHO	World health organization

INTRODUCTION

pulmonary functions are generally determined by the respiratory muscle strength , compliance of the thoracic cavity and elastic recoil of the lung . It is well known that pulmonary functions may vary according to the physical characteristics including height and body weight (١).

So many studies have demonstrated an association between body composition and lung functions which will affect the physical performance of the person (٢).

-Various studies have also shown a correlation between an increase in body mass index and asthma prevalence initially in children and recently in adults (٣). Longitudinal studies have shown that obesity and the incidence of asthma increase in parallel (٤).

- Changes in the respiratory mechanics with reductions in the functional residual capacity and in the tidal volume secondary to obesity as well as a sedentary lifestyle and a limited ability to perform physical activities , all of these related to obese individuals, can cause worsening of the respiratory functions (٥).

- PEFR and FEV١ tests are used interchangeably though the portability of the peak flow meter and the simplicity of the PEFR test make it particularly suitable for epidemiological studies of respiratory function (٦).

Recent attention to PEFR and attempting to improve the methods for recording ,displaying and analyzing its data , makes this interpretative tool a useful practical instrument (٧) .

-Values and prediction formula of peak expiratory flow rates (PEFR) and the effect of body mass index (BMI) have been established for Europian , American and Asian mean while there is scanty literature about these data in the Egyptians (٨) .

THE AIM OF THE WORK

The aim of the study is to detect the normal pattern of peak expiratory flow rates (PEFR) as reflection of pulmonary functions in relation to the body mass index (BMI) and waist circumference (WC) among police soliders .

OBESITY

Definition:

- It is a condition in which the natural energy reserve, stored in the fatty tissue of humans and other mammals, exceeds healthy limits. It is commonly defined as a body mass index (weight divided by height squared) of ٣٠ kg/m٢ or higher. Although obesity is an individual clinical condition, some authorities view it as a serious and growing public health problem. Some studies show that excessive body weight has been shown to predispose to various diseases, particularly cardiovascular diseases, DM type٢, sleep apnea and osteoarthritis (٩).

In practical settings, obesity is typically evaluated in absolute terms by measuring BMI (body mass index), but also in terms of its distribution through waist circumference or waist-hip circumference ratio measurements. (١٠).

BMI:

Body Mass Index (BMI) is a number calculated from a person's weight and height. BMI is a reliable indicator of body fatness for people. BMI can be considered an alternative for direct measures of body fat. Additionally, BMI is an inexpensive and easy-to-perform method of screening for weight categories that may lead to health problems (١١).

How is BMI used?

- BMI is used as a screening tool to identify possible weight problems for adults. Calculating BMI is one of the best methods for population assessment of overweight and obesity. Because calculation requires only height and

weight, it is inexpensive and easy to use for clinicians and for the general public. The use of BMI allows people to compare their own weight status to that of the general population (١٢).

- However, BMI is not a diagnostic tool to determine if excess weight is a health risk, a healthcare provider would need to perform further assessments. These assessments might include skin fold thickness measurements , evaluations of diet , physical activity, family history, and other appropriate health screenings. BMI overestimates body fat in persons who are very muscular, and it can underestimate body fat in persons who have lost body mass (e.g. many elderly). Mild obesity as defined by BMI alone is not a cardiac risk factor, and hence BMI cannot be used as a sole clinical and epidemiological predictor of cardiovascular health (١٣).

CALCULATION OF BMI:

BMI is calculated the same way for both adults and children. The calculation is based on the following formulas:

١-KILOGRAMS AND METERS (OR CENTIMETERS) :

-Formula: weight (kg) / [height (m)]٢

With the metric system, the formula for BMI is weight in kilograms divided by height in meters squared. Since height is commonly measured in centimeters, divide height in centimeters by ١٠٠ to obtain height in meters (١٢)

٢- POUNDS AND INCHES :

-Formula: weight (lb) / [height (in)] ٢ x ٧٠٣

Calculate BMI by dividing weight in pounds (lbs) by height in inches (in) squared and multiplying by a conversion factor of ٧٠٣.(١٢)

Interpretation of BMI for adults:

For adults ٢٠ years old and older, BMI is interpreted using standard weight status categories that are the same for all ages and for both men and women. For children and teens, on the other hand, the interpretation of BMI is both age- and sex-specific.The standard weight status categories associated with BMI ranges for adults are shown in the following table:

Table(١) : **The standard weight status categories associated with BMI ranges for adults.** (١٤)

Weight Status	BMI (kg/m٢)
Underweight	Below ١٨,٥
Normal	١٨,٥ – ٢٤,٩
Overweight	٢٥,٠ – ٢٩,٩
Obese	٣٠,٠ and Above

- A BMI of ٤٠,٠ or higher is severely (or morbidly) obese. A BMI of ٣٥,٠ or higher in the presence of at least one other significant co morbidity is also classified by some bodies as morbid obesity (١٥).

The correlation between the BMI number and body fatness is fairly strong; however the correlation varies by sex, race, and age. These variations include the following examples: