

# **Characterization and Prevalence of Metabolic Syndrome among Overweight and Obese Adults in 3 Palestinian Refugee Camps**

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## **Abstract:**

Metabolic syndrome (MetS) is a term used to describe the combination of risk factors including: abdominal obesity, elevated blood pressure, elevated fasting blood sugar, and dyslipidemia that increase the risk for both cardiovascular problems and/or type 2 diabetes mellitus (2). Several expert groups proposed diagnostic criteria for MetS: these include National Cholesterol Education Program's Adult Treatment Panel III (NCEP/ATP III) and the International Diabetes Federation (IDF) definitions.

## **Objectives:**

To characterize, establish and compare the prevalence of MetS in obese and overweight adult men and women (18-65 year old) living in three refugee camps in Nablus, West Bank – Palestine: Balata, Asker, and Al-Ein; by both the NCEP/ATP III and IDF definitions; and to find any associated socioeconomic or lifestyle factors linked to MetS.

## **Methods and Materials:**

A cross-sectional study was conducted and it included 689 seemingly healthy adults residing in *United Nations Relief and Works Agency* (UNRWA) refugee camps in Nablus in the West Bank: Balata, Asker, and Al-Ein. The participants were chosen from the attendees of UNRWA clinics in the refugee camps. Data were collected by interviews and anthropometric measurements, overweight or obese adults were offered to perform blood tests including fasting blood sugar (FBS), Triglyceride (TG), and High Density Lipoprotein (HDL). MetS was defined according to NCEP/ATP III and IDF criteria.

## **Results:**

The prevalence of overall obesity was 35.7% (29.2% in males, and 41.9% in females); and prevalence of overweight was 27.3% (28.9% in males, and 25.8% in females). The prevalence of MetS among obese and overweight individuals was 52.1% (51.9% men, 52.2% women) according to NCEP/ATP III and 69.4% (71.8% men, 67.6% women) according to IDF and increased with age according to both definitions. The prevalence of individual MetS components in male subjects was: 43.6% have high waist circumference, 51.3% elevated Blood Pressure, 64.1% have elevated HDL, 35.9% have elevated Triglycerides, and 52.6% have elevated Fasting Blood Sugar. In female subjects, the numbers were as the following: 66.2% have high waist circumference, 45.4% elevated Blood Pressure, 67.1% have elevated HDL, 28.5% have elevated Triglycerides, and 58.8% have elevated Fasting Blood Sugar. Physical activity was found to be

significantly inversely associated with MetS prevalence according to NCEP/ATP III but not IDF. No significant associations were found with gender, smoking, TV watching, and family history of hypertension (HTN) or Diabetes Mellitus.

**Conclusion:**

MetS is highly prevalent among obese and overweight in refugee camp residents in Palestine. Physical activity was found to be protective against MetS. This may promote for a national awareness of the benefit of physical activity in decreasing the risk of MetS and thus the risk of cardiovascular complications.

**Keywords:** Metabolic syndrome; obesity and overweight; Adults; West Bank; UNRWA refugee camps.