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**Prevalence and Determinants of Hyperlipidemia
among Blood Donors: Gaza Governorates**

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**Prevalence and Determinants of Hyperlipidemia
among Blood Donors: Gaza Governorates**

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Prevalence and Determinants of Hyperlipidemia among Blood Donors: Gaza Governorates




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Dedication

I would like to express my sincere gratitude to my supervisor, to my husband, to my sons, to my daughter, to my parents, sisters and brothers, to my friends, who encouraged me all the way through this study ... without their support and prayer, this work wouldn't be completed ...

I would like to convey my deep appreciations to all those who contributed to the completion of this thesis.

Awatif Fayez Abd El Qader

Declaration

I certify that this thesis submitted for the degree of Master, is the result of my own research, except where otherwise acknowledged, and this study (or any part of the same) has not been submitted for a higher degree to any other university or institution.

Signed:

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Abstract

Introduction: Hyperlipidemia is a medical condition characterized by an elevation of any or all lipid profile and/or lipoprotein in the blood, Exposure to Hyperlipidemia in all ages makes our health in risk for cardiovascular disease, cancer, diabetes mellitus, hypertension, and other diseases, which are considered the main causes of morbidity and mortality in the world.

Objective: The aim of this study is to determine the prevalence and determinants of hyperlipidemia among blood donors in the MoH hospitals among Gaza governorates.

Method: A cross sectional study was carried out among 379 males blood donors selected proportionally according to the total population in the five governorates of the Gaza Strip with age range between 20 - 50 years. Blood donors underwent an interviewed questionnaire regarding socio-demographic information, their medical history, family history, physical activity, smoking status, diet intake, and diet habits. Weight, height, waist circumferences, and blood pressure measurements were reported. Furthermore, blood samples from the participants were collected after fasting 12 - 14 hours for assessing the lipid profile.

Results: The prevalence of hypercholesterolemia, and hypertriglyceridemia was 22.7%, and 41.2% respectively. Low High Density Lipoprotein showed a prevalence of 11.9% and high Low Density Lipoprotein of 17%. The prevalence of Total Cholesterol, Triglyceride, low High Density Lipoprotein, and high Low Density Lipoprotein increased with age, marital status, Body Mass Index (BMI), and Waist Circumferences (WC), the relationships reached High statistical significant level ($P < 0.001$). Lipid profile was increased in the individuals with positive family history of diabetes and obesity. Total Cholesterol and low High Density Lipoprotein were increased among individuals who consumed sweets, salty snacks, and fried food ($P < 0.05$), while Triglyceride levels increased among participants who consumed salty snacks and meat, Low Density Lipoprotein levels decreased with consuming juice. Total Cholesterol, Triglyceride, and low High Density Lipoprotein levels were high in the serum of past smoking individuals. Total Cholesterol and Low Density Lipoprotein levels were low among the participants with high physical activity. Also there was statistically significant relationship between Total Cholesterol, Triglyceride, low High Density Lipoprotein levels and diastolic blood pressure ($P < 0.05$).

Conclusion: This study reveals that high prevalence of hyperlipidemia, hypertriglyceridemia, and hypercholesterolemia were found. Hyperlipidemia is associated with non-modifiable determinants as age, marital status, and family history and group of modifiable variables as obesity, lack of physical activity, and smoking. Interventions to control modifiable determinants can reduce risk for hyperlipidemia and subsequently minimize associated morbidity and mortality.

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List of Abbreviations

BB	Blood Bank
BMI	Body Mass Index
CBBS	Central Blood Bank Society
CDC	Center for Disease Control
CHD	Coronary Heart Disease
CVD	Cardiovascular Disease
DALYs	Disability-Adjusted Life Years
DNA	Deoxyribonucleic Acid
DVT	Deep Vascular Thrombosis
EDTA	Ethylene Diamine Tetraacetic Acid
EGH	European Gaza Hospital
EMC	Erythrocyte Membrane Cholesterol
FBS	Fasting Blood Sugar
GG	Gaza Governorates
GIT	Gastro Intestinal Tract
GPAQ	Global Physical Activity Questionnaire
GS	Gaza Strip
HDL	High Density Lipoprotein
HTN	Hypertension
IDL	Intermediate Density Lipoprotein
LDL	Low Density Lipoprotein
MDS	Mediterranean Diet Score
MoH	Ministry of Health
NACO	National AIDS Control Organization-India
NCDs	Non-Communicable Disease

NGOs	Non-Governmental Organization
NIH	National Institutes of Health
PCBS	Palestinian Center Bureau Of Statistics
PHC	Primary Health Care
PHIC	Palestinian Health Information Centre
PRCS	Palestinian Red Crescent Society
RII	Relative Importance Index
SD	Standard Deviation
SoP	State of Palestine
SPSS	Statistical Package for Social Science
TC	Total Cholesterol
TG	Triglyceride
TSH	Thyroid Stimulating Hormone
UNRWA	United Nations Relief and Works Agency
VLDL	Very Low Density Lipoprotein
VOO	Virgin Olive Oil
WB	West Bank
WC	Waist Circumferences
WHO	World Health Organization
WHR	Waist Hip Ratio

Chapter 1:

Introduction

1.1 Backgrounds

Hyperlipidemia is a medical condition characterized by an elevation of any or all lipid profile and/or lipoprotein in the blood. It is divided into two subtypes familial Hyperlipidemia, also called primary and caused by specific genetic abnormalities, and acquired, also called secondary which is resulting from another underlying disorder that leads to alterations in plasma lipid and lipoprotein metabolism (Farooq, 2013). American heart association defined hyperlipidemia as high level of fats in the blood (Hassan, 2013). These fats, called lipids include Cholesterol and Triglycerides. There are different types of hyperlipidemia depending on which lipid levels are high in the blood. First is Hypercholesterolemia, in which there is a high-level of Cholesterol and the second is Hypertriglyceridemia, in which there is a high-level of Triglycerides, the most common fat form. In addition, hyperlipidemia may be idiopathic, that is without known cause. The fat-protein complexes in the blood are called lipoproteins. The best-known lipoproteins are Low-Density Lipoprotein (LDL) and High-Density Lipoprotein (HDL). Excess of Low Density Lipoprotein Cholesterol contributes to the blockage of arteries, which eventually leads to heart attack (Nirosha et al., 2014).

Globally, a third cause of ischemic heart disease is attributable to High Cholesterol level, raised Cholesterol is estimated to cause 2.6 million deaths (4.5% of total deaths) and 29.7 million disabilities, the global prevalence of raised Total Cholesterol among adults in 2008 was 39%, 37% for males, and 40% for female (WHO, 2008). Prevalence of Hypercholesteremia in Egypt, Jordan, and Iraq was estimated: 39%, 48.8%, and 44% among adults (Musaiger & Al-Hazzaa, 2012). On the other side, many factors that cause hyperlipidemia, like hereditary factors, a diet high in saturated fat and cholesterol increases blood cholesterol and triglyceride levels, diabetes mellitus, kidney disease, and hypothyroidism (Navar-Boggan et al., 2015). Certain drugs, such as estrogen, corticosteroids, retinoid, protease inhibitors, thiazide diuretics, and beta-blockers, may cause hypertriglyceridemia (Herink & Ito, 2015). Obesity, chronic, excessive alcohol use increases the risk of hypertriglyceridemia. Smoking and lack exercising may lead to

hyperlipidemia (Perk et al., 2012). Some of these determinants are not modifiable like hereditary factors but others can be modifiable and preventable.

Blood donors are considered an important group in our country and they represent the healthy population. In our study, we try to identify the main determinants of hyperlipidemia among blood donors in Gaza Strip, which is considered the main cause of cardiovascular, coronary heart, and cerebrovascular disease.

1.2 Research problem

In the recent decades, Non Communicable diseases (NCDs), which called also chronic diseases, had been become the primary causes of mortality and morbidity for women and men in the world. According to Palestinian Ministry of Health, (2014) the 10 leading cause of deaths in West Bank was Cardiovascular diseases 29.5%, Cancer deaths 14.2%, Cerebrovascular diseases 11.3%, Diabetes mellitus 8.9%, Respiratory system diseases 5.4%, Prenatal Period Conditions 5.2%, Accidents 5%, Renal failure 3.9%, Infectious disease 3.3% and Senility 3.1%. Most of the NCDs like Cardiovascular, Cancer, Cerebrovascular, Diabetes Mellitus, and Hypertension are associated with Hyperlipidemia, There is no data available about Hyperlipidemia among healthy population in Gaza Strip, and we are not familiar with the variation of hyperlipidemia among the population in Gaza Strip. Blood donors reflect healthy population in Gaza, we will try to identify the prevalence and main determinants of Hyperlipidemia among these blood donors, this will help in putting plans in the future by decision makers to control Hyperlipidemia which is strong associated with NCDs.

1.3 Justification

Exposure to hyperlipidemia in all ages makes our health in risk for cardiovascular disease, cancer, diabetes mellitus, hypertension, and other diseases, which are considered the main causes of morbidity and mortality in the world. Hyperlipidemia is caused by several factors; most of them are preventable factors, so we need to conduct this study on the healthy population in Gaza Strip Governorates to identify the prevalence and determinants of hyperlipidemia. This will help to focus on the preventable factors to avoid Hyperlipidemia and this will help in future other researchers and decision makers to improve their programs and plans to prevent Hyperlipidemia and avoiding several diseases, which play the major causes of death in Gaza Strip.