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Screening for Non-communicable Diseases in Public Places in Upper Egypt

Mohamed Mashahit[1*], Hoda Hussein[1] and Eman Hanafy[2]

[1]Department of Internal Medicine, Fayoum University, Egypt.
[2]Department of Public Health, Fayoum University, Egypt.

Authors' contributions

This work was carried out in collaboration between all authors. Author MM designed the study, wrote the protocol and wrote the first draft of the manuscript. Author HH performed the statistical analysis, managed the analyses of the study and revised the final manuscript. Author EH managed the literature searches and data collection. All authors read and approved the final manuscript.

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ABSTRACT

Background: Noncommunicable diseases (NCDs) are one of the major health and development challenges of the 21st century. They cause human suffering and inflict harm on the socioeconomic fabric of countries, particularly low- and middle-income countries.
Aim: The study aims to screen for common NCDs in Egypt which are important for both primary and secondary health care services to provide more directed preventive and curative health programs.
Methods: A simple random sampling method was used to select 1816 participants screened for some common NCDs during world's diabetes day activities in collaboration with Upper Egypt Diabetes Association. The screening included history taking, BMI, blood pressure measurement, and blood sugar estimation.
Results: Obesity (BMI ≥30) was detected in 51.8%, diabetes mellitus in 18.2%, hypertension in 25.1%, coronary heart disease in 3.7%, chronic lung disease in 7.4% and cancer history in 1%.

**Corresponding author: E-mail: mam22@fayoum.edu.eg;*

Conclusion: In comparison with previous Egyptian and WHO reports, our study observed higher prevalence of obesity, diabetes mellitus, hypertension and coronary heart disease among the study participants, thus providing a rational basis for designing and implementing more directed healthcare programs at primary and secondary health care levels.

Keywords: NCDs; screening; Egypt.

1. INTRODUCTION

Noncommunicable diseases (NCDs) have been a difficult group to define. Even the term "noncommunicable diseases" is a misnomer, because it includes some diseases — notably, cancers of the liver, stomach, and cervix — that are at least partly caused by infectious organisms, and it usually excludes mental illnesses, despite their large contribution to long-term disability. However, four common behavioral risk factors (tobacco use, excessive alcohol consumption, poor diet, and lack of physical activity) are associated with four disease clusters (cardiovascular diseases, cancers, chronic pulmonary diseases, and diabetes) that account for about 80% of deaths from NCDs. According to WHO estimates, NCDs contributed to 36 million deaths globally in 2008, accounting for 63% of 57 million total deaths. About 80% of deaths related to NCDs occur in low- and middle-income countries, which also have a high proportion of deaths in middle age; such countries account for 90% of the 9 million NCDs–related deaths that occur before 60 years of age [1].

Among NCDs, cardiovascular disease accounts for the highest number of deaths (17 million), followed by cancer (7.6 million), respiratory diseases (4.2 million), and diabetes (1.3 million) [2].

These NCDs share common behavioral risk factors, namely, tobacco use, harmful use of alcohol, unhealthy diet, and physical inactivity, which, if eliminated, could prevent up to 80% of heart disease, stroke, and type 2 diabetes, and more than one-third of cancers. Hence, primary prevention strategies to control the global epidemic of NCDs are a high priority [3].

The absolute number of deaths due to NCDs is higher in the low- and middle-income countries owing to their larger populations. Age standardized rates of death due to NCDs are also higher in these countries than in the high-income countries [4].

In low- and middle-income countries, financial protection from the costs of treatment for NCDs, in the form of public financing or insurance, is limited. The health care infrastructure is also limited, with inadequate facilities for advanced care and shortages of trained medical specialists, nurses, and allied health workers. Paradoxically, some low- and middle-income countries have highly advanced tertiary clinical care facilities in major cities, staffed by very skilled professionals. However, even in such countries, the diagnosis and treatment of NCDs are usually very deficient at the primary and secondary care levels. In general, the health systems are configured to provide episodic care for acute illness and have not yet made the adaptations required to provide continuous care for chronic illness [1].

1.1 The Aim

The aim of this work is to screen for some NCDs and their risk factors in some public gatherings in Upper Egypt.

2. METHODS

Our study is a descriptive cross-sectional study. Sampling of 1816 participants were screened for some common NCDs during world diabetes day activities. The screening program was approved by College of Medicine, Fayoum University. Data were collected from volunteer adult visitors of big shopping centers and users of underground metro stations who accepted to record their data without names. The anonymous screening program was fulfilled by 18 trained young doctor screeners under supervisions of three professors in collaboration with Upper Egypt Diabetes Association and the Egyptian non communicable diseases alliance (EgNCDA). The screeners recorded participants' history regarding epidemiological data (age, race, sex, smoking habits). They recorded participants' history regarding diagnosed common NCDs (diabetes mellitus, hypertension, ischemic heart disease, chronic lung diseases and cancers). The program included measurement of body weight, height, and random blood sugar by

calibrated electronic glucometer and blood pressure by sphygmomanometer. Hypertension status was graded based on each participant's average blood pressure, using the Joint National Committee (JNC 7) classification [5]. Data was represented on Excel sheets. The standard weight status categories associated with BMI ranges for adults according to Centers for Disease Control and Prevention (CDC) are: Underweight below 18.5, Normal (ideal) 18.5 – 24.9, Overweight 25.0 – 29.9, Obese 30.0 and above [6].

3. RESULTS

The age of the total 1816 participants ranged from 18-66 years; 876 of them are < 40 years old (48%) and 743 are between 40 and 55 (41%) and the rest (11%) were between 55 and 66 years. Regarding sex, 44% of participants was males while 56% was females.

The study included mostly Egyptian participants (98.5%), but some Arab volunteers participated (22 Syrian 1.2%, 4 Iraqi and 2 Libyan).

Assessment of obesity as an important risk factor for several NCDs concluded that only 29.3% of participants had the ideal BMI, while 18.8% were overweight, 47% were obese and 4.8% had morbid obesity.

Regarding smoking habits, 48% of participants were cigarettes smokers while 8% were shisha smokers.

Screening for diabetes mellitus showed that 16.8% were actually diagnosed but only 28.5% from them were properly controlled by their medications. Further 1.4% was discovered to be diabetic during the screening.

The study showed that 24.1% was known to have hypertension on treatment with 88.3% of them was under proper control. From the participants, 1% was discovered to have hypertension.

Regarding history of ischemic heart disease in the participants, 67 (3.7%) of them were diagnosed (myocardial infarction 12, Stent insertion 33, hospitalization 22).

About 7.4% of the participants had history of chronic lung diseases (COPD 102, Bronchial asthma 13, Bronchogenic carcinoma 2, Others 18).

Seventeen persons (1%) had history of cancers (Breast 7, Liver 4, Lung 2, Hematologic 2, Thyroid 1, Prostate 1).

4. DISCUSSION

Each year, 16 million people die prematurely before the age of 70 from NCDs. Strikingly, 4 out of 5 of these deaths occur in developing countries, making such diseases one of the major development challenges of the 21st century [7].

Ethnic variations in susceptibility to disease have also been described, such as an increased risk of stroke in East Asian populations and an increased risk of coronary heart disease in South Asians [1].

Table 1. Demographic characteristics of the participants

Characteristic	Details	Frequency	Percentage (total 1816)
Age	Less than 40 years	876	48%
	40-55 years	743	41%
	More than 55 years	197	11%
Sex	Males	803	44%
	Females	1013	56%
Nationality	Egyptian	1788	98.5%
	Syrian	22	1.2%
	Iraqi	4	Less than 1%
	Libyan	2	Less than 1%
Smoking habits	Cigarettes	877	48.3%
	Shisha (narghile)	143	8%
BMI	Less than 25	532	29.3%
	25-30	342	18.8%
	30-35	854	47%
	More than 35	88	4.8%

Table 2. Prevalence of common NCD in the participants

Disease	Details	Frequency	Percentage	Special notes
Diabetes mellitus	Known to have	305	16.8%	
	Controlled	87	28.5% (from 305)	
	Newly diagnosed	26	1.4%	
Hypertension	Known to have	437	24.1%	
	Controlled	386	88.3%	
	Newly diagnosed	19	1%	
Ischemic heart disease	Known to have	67	3.7%	MI 12 Stent 33 Hospitalization 22
Chronic lung disease	Known to have	135	7.4%	COPD 102 Bronchial asthma 13 Bronchogenic carcinoma2 Others 18
Cancer	Known to have	17	1%	Breast 7 Liver 4 Lung 2 Hematologic 2 Thyroid 1 Prostate 1

Modernization, economic development, and technological advances have brought rapid demographic and epidemiological changes to the Arab world. These changes are manifested by increases in death rates from chronic non-communicable diseases, replacing the once dominant infectious diseases [8].

It is well known that chronic diseases represent a major problem and public health burden in developing countries. It represents 73% of mortality and 60% of global morbidity burden. There is emerging evidence that diabetes mellitus, obesity, hypertension and hyperlipidemia contribute to national morbidity & mortality in Egypt as it represents about 26% of all deaths related to chronic diseases [9].

Epidemiology and Surveillance Unit at the Egyptian Ministry of Health and Population has conducted a Community based survey study On Non-communicable diseases and their Risk Factors through 2005-2006 [10]. The survey reported that 2.4% and 4.6% of 10.000 participants had diabetes mellitus on insulin or oral hypoglycemic treatment respectively. It showed the prevalence of diabetes mellitus in Egypt whether diagnosed during the survey or currently on medication for raised blood glucose which was 15.8%. Another survey in 2012 [11] reported that 17.2% of the study population had diabetes mellitus. Our study reported little higher prevalence (16.8% currently on medications, 1.4% diagnosed during the study, total is 18.2%) which means increasing incidence of diabetes mellitus through the last ten years.

Raised blood pressure is estimated to have caused 9.4 million deaths and 7% of disease burden [10]. If left uncontrolled, hypertension causes stroke, myocardial infarction, cardiac failure, dementia, renal failure and blindness. There is strong scientific evidence of the health benefits of lowering blood pressure through population-wide and individual (behavioral and pharmacological) interventions. The global prevalence of raised blood pressure (defined as systolic and/or diastolic blood pressure equal to or above 140/90 mmHg) in adults aged 18 years and over was around 22% in 2014 [9].

The Egyptian survey (2005-2006) [10] reported that 12.2% were diagnosed to have hypertension in the preceding 12months, but only 8.5% from the studied population were on treatment for hypertension, which means great number of the participants may ignore the impact of hypertension on their health. The survey reported that 26.7% of the study population either had hypertension on medication or diagnosed during the survey. The next survey in 2012 [11] reported much higher prevalence of hypertension (39.7 %). Our study reported a prevalence of hypertension 24.1% (Table 3).

Table 3. Prevalence of NCDs and some risk factors in Egypt across the last years

Parameter	2005-2006 survey [10]	2011-2012 survey [11]	The current study
Over weight (BMI from 25)	66%	62.2%	70%
Obesity (BMI from 30)	30.3%	31.3	52%
Smoking	18%	23.5%	48.3%
Diabetes mellitus	15.8%	17.2%	18.2%
Hypertension	26.7%	39.7%	25.1%

Obesity is an important risk factor for several NCDs and it is increasing problem worldwide. In Egypt, Egyptian Ministry of Health survey [10] reported that 21.8% and 39% from males and females participants respectively had BMI more than 30. We recorded higher prevalence (51.8%) in both sexes.

Worldwide, the prevalence of obesity has nearly doubled since 1980. In 2014, 11% of men and 15% of women aged 18 years and older were obese. More than 42 million children under the age of 5 years were overweight in 2013. The global prevalence of diabetes in 2014 was estimated to be 9% [9].

The 2011/12 STEP wise survey, conducted by the Egyptian Ministry of Health and Population, in collaboration with WHO, revealed a significantly high prevalence of risk factors for NCDs among the adult population. The prevalence of smoking and use of shisha tobacco was 24%. Sixty six percent of women were overweight, 42% were obese and almost three quarters of the population were not involved in vigorous activity. Egyptians have an average daily salt intake of 9 grams, nearly double the recommended allowance [11].

In a WHO Saudi report 2008, estimated prevalence of obesity was 33%, raised blood glucose was 17.9%, and raised blood pressure was 33.1% of the population [12].

Rahim and colleagues [8], in 2014 compared the prevalence of daily tobacco smoking, insufficient physical activity and obesity in Arab countries and noted that the 2008 age standardized prevalence of daily tobacco smoking in adults aged 15 years or older varied widely among the Arab countries, from 3·4% in Oman4 to 37·6% in Lebanon3. They reported that in all countries, men reported smoking more than did women, and the largest disparities were in Egypt, Algeria, Morocco, and Libya.

Of the 17.5 million deaths due to cardiovascular disease in 2012, an estimated 7.4 million were due to heart attacks (ischemic heart disease) and 6.7 million were due to strokes [9]. Over the last four decades, the rate of death from cardiovascular diseases has declined in high-income countries, owing to reductions in cardiovascular risk factors and better management of cardiovascular disease. Recent studies indicate that, although the risk-factor burden is lower in low-income countries, the rates of major cardiovascular disease and death are substantially higher in low-income countries than in high-income countries. Currently, over 80% of cardiovascular deaths occur in low- and middle-income countries [9]. Our study reported 3.7% of the participants had history of coronary heart disease.

5. CONCLUSION

In conclusion, higher prevalence of obesity, diabetes mellitus, hypertension and coronary heart disease was observed among the study participants necessitating designing and implementing more directed healthcare programs at primary and secondary health care levels.

CONSENT

All authors declare that written informed consent was obtained from the patient to perform this study.

ETHICAL APPROVAL

All authors hereby declare that all experiments have been examined and approved by the appropriate ethics committee and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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