ISSN: 2573-9565

Research Article

Journal of Clinical Review & Case Reports

Evaluating the Adherence of Primary Health Care Centers in Gaza Strip to the WHO-PEN Protocol 1: A Cross-Sectional Study

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Submitted: 15 May 2019; **Accepted**: 20 May 2019; **Published**: 27 May 2019

Abstract

Background: *Cardiovascular disease (CVD) is common in the general population, affecting many of adults above 40 years of age. It is a multi-factorial disease. Some risk factors; such as family history, gender, ethnicity and age cannot be changed. Other risk factors are modifiable including high blood pressure, high cholesterol and diabetes. Patients will not necessarily develop cardiovascular disease if they have a risk factor. But the more risk factors they have the greater the likelihood that they will, unless protective measures and actions are taken to modify their risk factors and work to prevent them compromising their heart health.*

Objectives: *The objectives of this study were: to evaluate the adherence of major primary health care centers to the WHO-PEN Protocol 1, Package of essential noncommunicable (PEN) disease interventions for primary health care, recommendations;and to provide more accurate estimate of cardiovascular risk using hypertension, type 2 diabetes mellitus and tobacco use as entry points.*

Methods: *A cross-sectional study involving 200 patients who were already diagnosed with NCDs was conducted atprimary health care centers. Data was collected retrospectively using a self-designed questionnaire based on the WHO- PEN checklist. Patients' files were selected randomly.*

Results: *Based on the analysis of whole cohort (200 cases). The prevalence of type 2 diabetes was 39% and hypertension was 28.5%, whereas 32.5% had both. There were only 17 smokers among patients representing 8.5% of the sample. Using WHO/ISH, WHO/International Society of Hypertension, Risk prediction charts; half of patients were in the ten-year cardiovascular risk category of less than 10%. On the other hand, 5% had a ten-year cardiovascular risk over 40%.49% of patients had a first-degree family history of heart disease? All patients were counseled on diet, exercise and smoking cessation.*

Conclusion: *These results demonstrate high adherence to the WHO-PEN protocol in these two centers reflecting a high quality of care and follow-up. Furthermore, the medical records were fully filled with adequate information for each item. However, there were some deficiencies in the risk estimation, which should be documented for better counseling for patients with high risk.*

Keywords: Cardiovascular disease (CVD), Risk Assessment, Hypertension, Type 2 Diabetes, WHO/ISH Risk Prediction Charts, Smoking, Non-Communicable Disease (NCD), Gaza Strip

Introduction

Cardiovascular disease is the leading cause of death worldwide. It accounts for almost half of all NCD-related deaths [1]. CVD deaths are mainly due to myocardial infarction, stroke and cardiac failure, caused by one or more major CVD risk factors, including genetic predisposition, smoking, hypertension, hypercholesterolemia and diabetes [2].

The same was in Palestine, 30.6% of all deaths in 2016 were due to CVD. Half of them had type 2 diabetes or hypertension [3].

Research from several countries has previously stated that treatments of established CVD explain less of the decline than reductions in risk factors to prevent development of cardiovascular disease. Between 42% and 60% of the decline in CVD deaths has been attributed to changes in risk factors including reduction in total cholesterol, systolic blood pressure and smoking prevalence, while 23% to 47% was attributed to treatments including secondary preventive therapies [4-7].

A reduction of CVD morbidity and premature mortality has been accomplished through a combination of three strategies: use of WHO/ISH risk charts for accurate estimate of patients' risk level; individual-based primary prevention strategies through proper counseling; and secondarytreatment to NCD in order to prevent disease progression in patients with established CVD.

The use of WHO/ISH risk charts, for evaluating patients' status of which risk level category is he/she, is of great benefit for effective management of NCD. The charts provide approximate estimates of cardiovascular disease (CVD) risk in people who do not have established coronary heart disease, stroke or other atherosclerotic disease. Simultaneously, WHO PEN protocol 1 provides step-wise manner instructions for each risk level using hypertension, type 2 diabetes and tobacco use as entry points. In other words, it provides an individual-based proper counseling (behavioral and pharmacological) to minimize their risk factors. Moreover, it guides the practice of health care providers for convenient choice of medications [8, 9]. Indeed, this leads to suitable management of patients' risk. Thus, declining CVD deaths.

Properly functioning health systems are vital for prevention and control of NCDs, and for improving health outcomes in general. For equity and efficacy of primary health care centers, they have implemented these tools to strengthen the service delivered to NCDs patients. However, there is paucity of evidence on the use of WHO/ISH risk prediction chart in Gaza. Therefore, this study aimed to evaluate the estimation of total 10-year CVD risk documented in patients' medical records and the medical care they receive compared against the instructions of WHO PEN protocol 1.

Methods

Study design and settings

This cross-sectional study was carried out in two major primary health care centers in Gaza. The study involved 200 patients diagnosed with either hypertension or type 2 diabetes or both who underwent screening at these centers in April 2018.

All eligible men and women were included as the study population. Eligible criteria were age 40–80 years, pregnant women, mentally retarded and bed-ridden patients were excluded from the study.

CVD Risk Assessment

We utilized WHO/ISH risk prediction charts to compare the risk documented in patients' medical record to the one we calculate according to patients' test values in the record. Two sets of WHO/ISH risk prediction charts for Eastern Mediterranean, with and without cholesterol, were used to classify cardiovascular risk (figure 1 and 2) [10]. Both sets use age (40–49, 50–59, 60–69 and ≥70 years), sex (male, female), smoking (no, yes, ex-smoker <12 months), systolic blood pressure (<140 mmHg; 140–160 mmHg, 160–180 mmHg and ≥180 mmHg), and presence or absence of diabetes (defined by fasting blood glucose ≥7 mmol/L) to grade cardiovascular risk. The chart developed for settings where blood cholesterol can be measured also uses blood cholesterol (total cholesterol in five categories: <5 mmol/L, 5 to <6 mmol/L, 6 to <7 mmol/L, 7–<8 mmol/L and ≥8 mmol/L).

Data Collection

Fourmedical students were trained for one week on study protocol, tools and data collection techniques of the study. Data were collected usinga self-designed questionnaire based on the WHO-PEN checklist. The survey tool encompassed questions related to demography and socio-economy, tobacco, dietary intake, physical activity level and history of high blood pressure and diabetes. The questionnaires were revised after conducting a pilot survey among 15 medical records. The data were collected retrospectively choosing the first completed 200 files, in case the file was not completed, we skipped it to the next one.

Definitions of variables

Education status was categorized as no schooling and attended school [10]. A smoker was the one who has smoked currently and who quit smoking less than one year before the assessment [11]. Systolic blood pressure was mean of last two readings. A respondent with diabetes mellitus was defined as the one who had fasting venous blood sugar level 7 mmol/l or who was taking oral hypoglycemic drug or insulin [10- 12]. For occupation, respondent working in paid governmental and nongovernmental organization was labeled as employed, running own business as self-employed, and student or housemaker or non-paid worker as unemployed [13].

Statistical Analysis

The collected data were entered in Microsoft Excel. Data were analyzed by the SPSS version 23.0. Frequency distributions and percentages were computed for all the variables.

Ethical Consideration

Ethical clearance was obtained from Directorate General of Human Resources Developmentat Ministry of Health, State of Palestine. Written consent was gained form primary health care centers' heads to enable us to review medical records. Study objectives, data collection procedures, benefits and risks of the study, confidentiality, and anticipated use of the results were explained to research committee in the ministry in detail before executing our work.

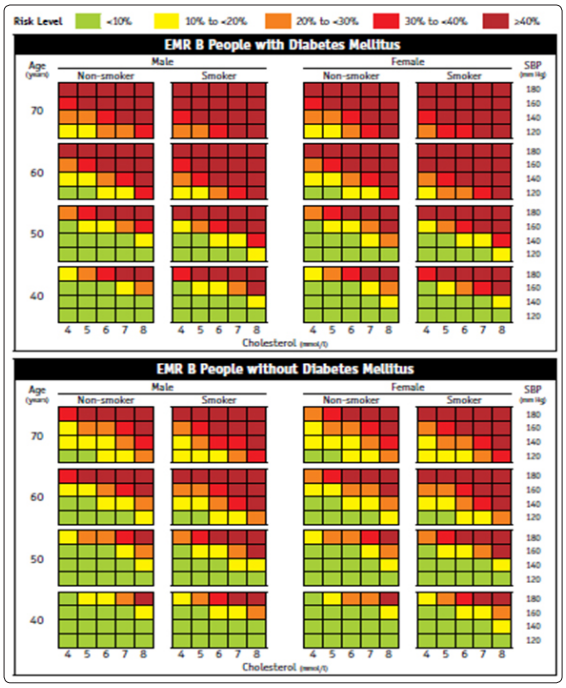

Figure 1: 10-year CVD risk prediction chart by gender, age, systolic blood pressure, smoking status and presence or absence of diabetes mellitus, where cholesterol is measured

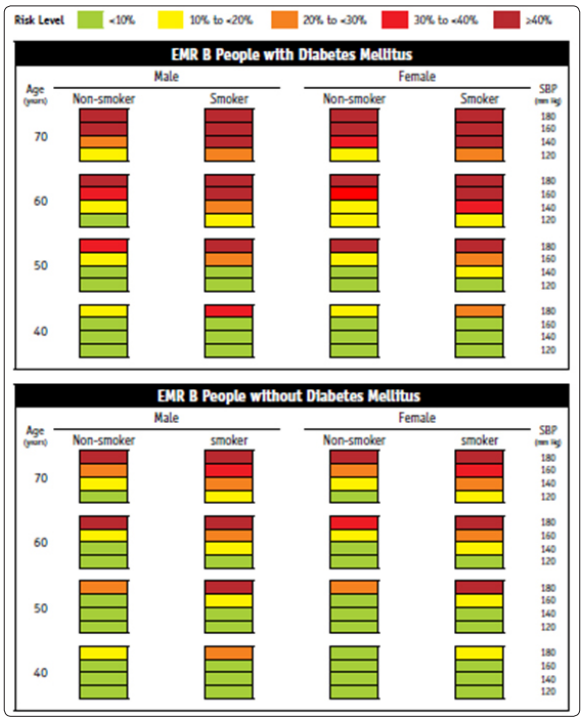

Figure 2: 10-year CVD risk prediction chart by gender, age, systolic blood pressure, smoking status and presence or absence of diabetes mellitus, where cholesterol is not measured.

Results

Baseline Characteristics

The mean age of the subjects was 57.6 (±15.2) years with 60.5% subjects being women. Table 1 reveals the association between different socio-demographic/study variables and the gender of the study subjects. Most of the study sample, (36.5%) were from the age group of 50–59 years, followed by (28%) of the 60–69 years. The higher proportion of women did not attend the school and were non-worker as compared to the men. One-third of the subjects were obese with no gender preponderance. In addition, abdominal obesity was present in (19%) of women compared to (25.3%) of men.

Associated co-morbidities

Study subjects didn't suffer only from hypertension or type 2 diabetes, but also, they had some associated co-morbidities. Heart diseases such as; ischemic heart disease, congestive heart failure and transient ischemic attack were on top of co-morbidities. Interestingly, we found that two thirds of patients, who have heart disease, had a first-degree family history that also experienced a heart disease. On the other hand, some patients had nephropathy as co-morbidity. However, as a consequence of relatively uncontrolled diabetes, patients were referred due to many reasons. Mostly they were referred for eye exam because of deterioration of vision. Table 2 and 3 summarize the associated co-morbidities patients suffered from and most frequent causes for referral.

CVD risk categories by WHO/ISH

As we reviewed patients' records, the risk category was documented for each patient. However, we re-assessed all patients according to results in their records. Strikingly, 20% of risk assessment mismatched with what we had calculated. Otherwise, half of subjects were categorized at risk <10. Furthermore, only 5% had a risk more than 40. Risk evaluation is of great importance as it helps the clinicians whether to start prescribing drugs or not. Moreover, which drug to choose and if there is any need for drug combination. The bar chart compares between the documented risk in patients' records and the one we have calculated at reassessment.

Proportion of Population Who Need Immediate Drug Therapy

We followed WHO PEN protocol 1 to decide if the subject required pharmacological intervention or not according to their CVD risk estimation [see ref. 14 for these instructions]. Then, we compared it with what have been prescribed in his/her drug sheet. WHO PEN protocol 1 gives certain criteria of patients and suitable recommendations for drug prescriptions [14]. The proportion of population who needed actual drug intervention for CVD prevention, whom CVD risk is 30-40 or over 40, was 18%. Nevertheless, we found that 30% of patients received a pharmacological intervention. This means that there is overuse of some drugs that are not required. Table 4 spots light on drug prescription and combinations, either for management of DM and hypertension or for CVD prevention, were used at primary health care centers.

Table 1: Characteristics of study subjects

Study variables	Men	Women	Total
Gender	79	121	200
Age in years			
40-49	7	16	23
50-59	33	40	73
60-61	22	34	56
≤70	19	29	48
Educational status			
Not schooling	29	34	63
Primary	45	36	81
≥ Secondary	32	24	56
Occupation			
Employed	22	12	34
Self employed	68	10	78
Unemployed	24	38	62
Retired	20	6	26
Physical activity status			
Inactive	53	101	154
Active	25	21	46
Waist circumference[a] (cm)			
Normal	40	34	74
High risk	46	80	126
Blood pressure[b] (mm Hg)			
Normal	54	94	148
Above normal	24	28	52
Diabetes[c]			
Absent	19	38	57
Present	59	84	143
Total cholesterol (mg/dl)			
> 200 mg/dl	52	62	114

≥ 200 mg/dl	26	60	86

[a]Normal (<102 cm for males and <88 cm for females).
[b] Normal (systolic blood pressure <139 mm Hg and diastolic blood pressure <89 mm Hg).
[c]Present (fasting blood sugar (>125 mg/dl).

Table 2: Prevalence of co-morbidities in study subjects

Cause of referral*	No. of patients
DM with recent deterioration of vision or no eye exam in 2 years	151
BP ≥140 or ≥ 90 mmHg in people < 40 years	21
Total cholesterol >8mmol/l	40
High cardiovascular risk	10

* A patient may be referred due to more than one cause.

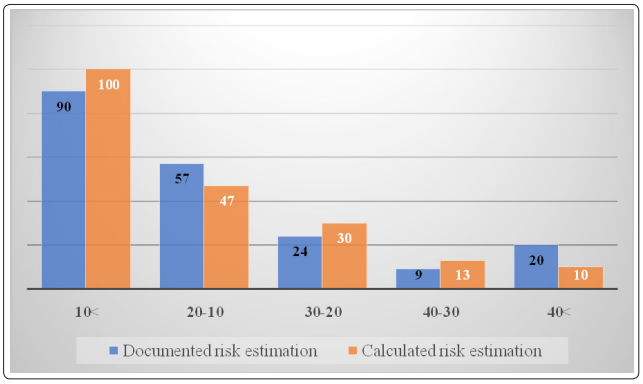

Figure 3: CVD risk distribution

Figure 4: Classification of drug prescription and combinations

Type of treatment	No. of patients
Metformin, antihypertensive and baby aspirin	60
Metformin, antihypertensive and statins	50
Antihypertensive and β-blockers	23
Antihypertensive and diuretics	18
Antihypertensive and statins	31
Antihypertensive and baby aspirin	15
Not stated	3

Discussion

This study is the first one to compare the practice at primary health care centers and management of CVD risk in Gaza strip with WHO/ISH risk charts. It has been well documented that the definitiveconsequence of myocardial infarction/stroke/death rarely precipitates from a single potential risk factor, but more often because of the combined effect of several risk factors [15, 16].

Utilization of WHO/ISH chart aids to categorize population into different risk levels. Population-based lifestyle modification strategy can be applied to low-risk population (categories less than 10 and 10-20) while individual counseling and frequent follow-up assessment need to be added for moderate risk population (category 20-30). However, more rigorous treatment strategies would be needed for the population at high (category 30-40) and very high-risk (category more than 40) groups [10].

In the present study, different socio-demographic and biochemical parameters have been assessed to identify their association with the study population. It has been found that level of physical activity, BMI measurement and waist circumference of the study participants was statistically associated with the gender of the study subjects. Although we found marked differences between estimates with and without cholesterol in the moderate and high-risk groups, this was not so for the low-risk group, precisely the group for which drug therapy would not be indicated. The basic purpose of these charts is to detect those at high risk who need immediate intervention. That was achieved in our study with suitable assessment for subjects where cholesterol is not measured. This indeed should lead to appropriate drug selection.

As explained in the WHO/PEN protocol 1instructions for assessment and management of cardiovascular disease, individuals who have blood pressure of ≥140/100 mm Hg need appropriate drug therapy even though they are in low and moderate CVD risk category. However, drug treatment was not initiated [14]. This was justified by health care providers that these individuals had a low risk according to their estimation and the absence of associated risk factors. This can be prevented by modifying the threshold for treatment initiation from a risk category of 30 to 20. Our results demonstrated that 12% would be treated by drug if a risk of 20 was considered as a threshold while about 9% would require drug at threshold of 30 as a risk level.

In the current study, tobacco use (17%) was recorded as a risk factor with highest prevalence in the category of 20-30 and 30-40 risk level, respectively. While in the more than 40 risk group, prevalence was higher for low HDL (30%) and hypertension (26%). The probable reason for such results is because of the sedentary lifestyle and higher prevalence of central obesity among them.

Level of education had a great impact on CVD risk. A study conducted in Vienna echoed a similar finding that educationallevel is significantly related to risk factors understanding [17]. As a result, increasing knowledge on risk factors can strongly motivate people for changing their attitudes toward risk factors [18]. This fact suggests that we need to enhance awareness and knowledge about prevention of cardiovascular diseases. Occupation was significantly associated with elevated CVD risk. A higher proportion of unemployed and retired subjects had raised risk. A study from Mauritius Island in India also confirmed the relation between occupation and cardiovascular risk, mostly related to physical activities and economic status [19]. These findings provide the evidence that we should concentrate on unemployed population for early prevention of cardiovascular disease. As expected, age-related increase in CVD risk was associated with an increase in risk factor level [20].

Since the present study was conducted in two primary health care centers in Gaza and thus findings of the study cannot be generalized to the other centers.

Conclusion

Use of a WHO/ISH risk tool with or without cholesterol would enable better targeting of those more likely to develop CVD without introducing excessive use of drugs for CVD prevention. Risk scores that estimate an individual's total CVD risk can help ensure that individuals with higher total CVD risk, especially men and older people, do not go without essential preventive treatment because of the absence of single significantly elevated risk factors. This cross-

sectional study indicates that there is considerable burden of CVD risk in Gaza strip as assessed by WHO/ ISH risk prediction charts. We recommend adopting these charts and thoroughly following WHO PEN protocol 1 instructions for better management of CVD risk. In addition, providing training to all health providers accordingly.

Authors' Contribution

Afifi T and Alwali A designed the study questionnaire. Afifi T, Alwali A, Dwekat D and Alyazouri H collected and analyzed the data. Afifi T wrote the first draft of the manuscript. Dwekat D reviewed it for grammatical and statistical mistakes. Elessi K supervised the overall process and reviewed the final draft. All authors approved the final version of the manuscript.

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