

Prevalence of non-communicable Diseases (NCDs) in an urban area in Sudan and the role of medical students in health promotion of patients with NCDs

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Abstract

Introduction: Chronic non-communicable diseases are prevalent conditions in developing countries, such as Sudan. The World Health Organization (WHO) recommends ongoing surveillance of non-communicable diseases (NCDs). This study aimed to assess the prevalence of NCDs in urban area in Sudan and the role of medical students in health promotion of patients with NCDs.

Materials and methods: A community-based cross-sectional study, conducted in 2022 among families in Wad-Medani city in central part of Sudan. A structured interviewer-administered questionnaire was used for data collection, it included demographic data, the presence of any type of NCDs. The last part of the questionnaire was filled by medical students about their role in health promotion and health education to patients with NCDs.

Results: The total number of population who participated in this study was 607. The prevalence of NCDs in the study population was 20%. Out of those who had NCDs 35% had diabetes mellitus, 40% had hypertension. Bronchial asthma was found in 12% of the individuals, cardiovascular diseases were found in 4%. There were significant association between the age of the patient and the occurrence of diabetes and hypertension (P-value. 0.000 and 0.001) respectively. Role of medical students in the health promotion of patients with NCDs was health education, advised for regular follow up in PHC centres to 40% of patients.

Conclusion: The prevalence of NCDs among the study population was high with hypertension as the most prevalent chronic condition. Medical students play great role in the health promotion of patients with NCDs.

Keywords: Prevalence; Non-Communicable Diseases; Medical students; Urban area; Sudan

1 Introduction

Non-communicable diseases are mostly chronic diseases such as cardiovascular diseases, cancers, chronic respiratory diseases and diabetes. They are the result of a combination of genetic, physiological, environmental and behavioural factors. Full health is one of the basic human rights and requires a healthy lifestyle (1) and since NCDs tend to be of long

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duration and their incidence is increasing in low- and middle-income countries, health promotion is important for prevention and management of these diseases. Hypertension is an example of the rising incidence of NCDs, were the number of adults with hypertension was estimated to increase by 60% to a total of 1.56 billion in 2025 mainly in developing countries (2). WHO described NCDs as being largely preventable mainly by competent health promotion actions through professional education which is responsive to the priorities of the society. The main elements of health promotion practice include: systematic assessment of global health and health behaviours, people's environmental and social contexts, and targeted interventions; accountability of the health professional and patient; and systematic follow-up [3]. Two-thirds of deaths globally are due to NCDs (4). NCDs have a significant and growing burden on the health care system of both developed and developing countries. At least 25% of economic budget in Europe is spending in the management of the four major NCDs (cardiovascular diseases, cancers, chronic respiratory diseases and diabetes) (5). NCDs pathogenesis is associated with many socioeconomic and educational factors (6). NCDs are chronic diseases and have slow progression (7). There is need for up-to-date international effort to detect NCDs prevalence and their associated risk factors so as to evaluate the effectiveness of ongoing public health policies and to develop further NCDs prevention and control strategies. (8) NCDs and their risk factors are the leading contributors to morbidity and mortality globally, particularly in low- and middle-income countries (9). In Sudan almost one in three individual had three or more NCD risk factors (10). Global health education (GHE) has increasingly been recognized as important part of medical education. One the important tasks of medical institutions is to prepare future doctors to respond to the needs of a globalized world, which include knowledge of global health and sustainable development (11). To increase the global impact of health education and promotion related to NCDs health professionals including medical students who should have role in lifestyle behaviour and health education of the community (3). NCDs becoming a major public health challenge and in near future, it will account for approximately 70% of the mortality in developing countries (12). Double burden of communicable and NCDs has huge effect in the economics of the community and this will lead to social and economic losses (13). Because of the increasing burden of NCDs, it is important to strength the primary healthcare systems to deliver efficient care for patients with NCDs (14). To decrease the burden of NCDs and for better services for patients, management of such patients is mobilized to primary health care centres (PHC) (15). In Africa, mortality due to NCDs is expected to be more than the combined mortality from communicable, maternal, neonatal, and nutritional diseases by 2030 (16). Prevention of NCDs needs policies to address the major risk factors of NCDs like smoking, unhealthy diet, alcohol abuse and physical inactivity (17). For this reason, WHO has set standard Package of Essential Noncommunicable Disease (WHO PEN) Interventions for Primary Health Care in low-resource settings which includes NCDs screening and management services (18). So, this study aimed to assess the prevalence of NCDs in urban area in Sudan and the role of medical students in health promotion of patients with NCDs.

2 Material and methods

A community-based cross-sectional study, conducted from October to December 2022 among families in Wad-Medani city, Alkobra locality in central part of Sudan. Data was collected from 19 PHC catchment area by batch 40 medical students of Gezira University during their course of primary health care practice in health centre and family medicine which is conducted in health centres where they work in primary health care centres (PHC) and with home visits to the families in the catchment area. In order to collect data, the researchers used structured interviewer-administered; questionnaire which included demographic data including age, gender, marital status, job status (employee, unemployed, housekeeper, retired), education status (illiterate, elementary, intermediate, high school, diploma, associate degree, bachelor), the presence of any type of NCDs such as hypertension and other cardiovascular diseases, cancers, chronic respiratory diseases and diabetes. The last part of the questionnaire was filled by the medical student about his role in health promotion and health education or advise to the patients about the importance of regular follow up in primary health care centres or hospital. Data was analyzed using the Statistical Package for the Social Sciences (SPSS) version 22. The prevalence of NCDs was defined as the presence of any studied NCDs among the study population during the study period.

2.1 Ethical considerations

Ethical clearance was obtained from the ethical committee of the faculty of Medicine, University of Gezira before starting the actual data collection. Verbal consent was taken from participants. Moreover, the confidentiality of information was guaranteed by using code numbers and the data was kept securely locked up. Individuals identified as cases of NCDs received health education regarding their diseases and were advised to have regular follow up with their doctors in the nearby health centres and those with complications or who had irregular follow up were referred to the nearby clinic for further treatment and follow-up.

3 Results and discussion

100 families were enrolled in this study in the catchment area of 19 PHC in Wad- Medani city which were covered by batch 40 medical students, and the total number of population who participated in this study was 607. NCDs was found in 73 families (73%). Most of the house- hold of these were employee 24 (24%). The majority of families (69%) had low monthly income (120.000 Sudanese pounds or less) and 31 families had monthly income of 150.000 Sudanese pounds or more. 122 members out of 607 members had NCDs i.e. the prevalence of NCDs in the study population was 20%. Out of those (122) who had NCDs,43 persons (35%) had diabetes mellitus, 50 (40%) had hypertension. Bronchial asthma was found in 15 (12%) of the individuals. Heart diseases were found in 5 persons (4%). Cancer was found in 1 patient (1%). Psychiatric disorders in 1 individual (1%).Obesity in 2 (2%). Dental diseases in 2(2%)and other diseases in 3 (3%) as shown in table 1. Female patients were 68 (55%) and males were 54(45%).The majority of patients (53) (43%) were in the age group 45-60 years. Only 11% of patients were in the age group 1-15years. 73 patients (59%) take their medications regularly while 49 (41%) were not. 88 (60%) patients go for regular follow up in the nearest PHC centre while 44 (40%) individuals had irregular follow up in the PHC centre. 25 patients (20%) had complication of their disease and 97 (80%) had no complications. There were significant association between the age of the patient (age more than 60 years) and the occurrence of diabetes and hypertension. (P-value. 0.000 and 0.001) respectively. No significant association between the sex of the patient and occurrence of diabetes and hypertension. (P-value 0,033, 0.65) respectively. There was no significant difference between family income and presence of NCDs. Role of students in promotion of the health of patients with NCDs was health education to all patients, advised for regular follow up in PHC centres to 40% of patients and 1 patient was advised to go to general hospital.

Table (1) Types of NCDs

| Type of NCDs | Number | Percentage |
|-----------------------|--------|------------|
| Hypertension | 50 | 40% |
| Diabetes mellitus, | 43 | 35% |
| Bronchial asthma | 15 | 12% |
| Heart diseases | 5 | 4% |
| Psychiatric disorders | 1 | 1% |
| Cancer | 1 | 1% |
| Obesity | 2 | 2% |
| Dental diseases | 2 | 2% |
| other diseases | 3 | 3% |
| Total | 122 | 100% |

This community-based cross sectional study enrolled 607 individuals from 100 families in Wad-Medani city in Sudan showed that the majority of the families had NCDs and nearly quarter of the population had NCDs. Hypertension was the most prevalent NCDs (40%) followed by diabetes mellitus (35%), bronchial asthma, cancer, psychiatric disorders, obesity and lastly dental diseases. More than half of the patients were females and the majority of the patients were middle to old age group. This was similar to the study conducted in Sudan which showed increased risk of NCDs in middle and elderly age group (10). It was also similar to the study conducted from the data of the WHO region office in Africa showing the increase prevalence of hypertension to more than 30% as well as increase prevalence of diabetes mellitus (22%) (19). The findings of this study were also similar to several studies carried out in northwest Ethiopia where the prevalence of hypertension was 32.2%, followed by bronchial asthma but the prevalence of diabetes mellitus was low (4.9%) unlike this study (20). In a meta- analysis conducted in Ethiopia, the overall pooled prevalence of hypertension was 21.81% (21). The results in this study were also similar to a meta-analysis done in older prisoners where the prevalence of hypertension was 39%, diabetes 14%, cancer 8%, cardiovascular disease 38%, COPD prevalence estimates ranged from 4% to 18%. Heterogeneity across studies was high (22). In a study carried out in Somaliland they found that, the prevalence of hypertension in both women and men was increased from 15% in the age group 20-34 years to 67% in the age group 50-69 years, and the prevalence of diabetes from 3 to 22% in the same age groups (23). In a meta-analysis study done in Sub-Saharan Africa, they found the prevalence of NCDs and risk factors varied considerably between countries: diabetes mellitus from 0 to 16%, hypertension from 6 to 48%, obesity from 0.4 to 43%.

Hypertension prevalence was consistently similar among men and women which was also found in this study (24). In a study conducted in Uganda, the prevalence of hypertension was 22.1% for men and 20.5% for women, and 9% of participants were diabetic (25). In the Sultanate of Oman, STEPS survey 2017 study found the prevalence of raised blood pressure was 33%, raised blood glucose was 16%, which was more or less similar to this study (8). The findings in this study was similar to a study conducted in Colombia where hypertension was the most prevalent chronic condition (22.2%) followed by diabetes ((5.6%), asthma (2.7%) and cancer (1.2%) and the prevalence of multiple NCDs increased significantly with age and was more common in households with higher income unlike this study where the prevalence of NCDs was the same in both high and low income households (6). The same order of prevalence of NCDs was found in studies carried out in: Nepal (7), China in the Shanghai Changfeng Study (26), Iran (27) and among non-camp Syrian refugees in northern Jordan (28). In a study done in Bangladesh they found the prevalence of overweight/obesity (31.6%,) was higher than hypertension (20.3%) (29). Another study done in Nepal for the prevalence of some selected NCDs, they found that chronic obstructive pulmonary disease was the most prevalent NCDs (11.7%) followed by, diabetes mellitus (8.5%), chronic kidney disease (6.0%) and coronary artery disease (2.9%) (30). The high prevalence of NCDs in this study especially hypertension and diabetes, can be explained by the fact that, the change of lifestyle behaviour such as diets high in saturated fat, salt and sugar and sedentary lifestyles in recent decades in Sudan and globally has played a major role in the occurrence of these diseases. Hence health promotion by health care cadre and even medical students in our faculty during their primary health care courses could play a role in prevention and fighting against NCDs. The high prevalence of NCDs in elderly is well evident in Africa, and in this study, prevalence of NCDs was found to increase with advanced age and this was similar to a study done in Ethiopia and India (20). Old age people are also prone to have increased risk for exposure for risk factors for NCDs and so will have greater risk of developing NCDs. The majority of NCDs patients in this study had regular follow up in the PHC centres and only one fifth of them had complications due to their disease. This may be attributed to the fact that, the health centres are near to their homes and they are keen for their health, in addition to the role of medical students of Gezira University in the promotion of the family health via health education and advise to families regarding the importance of regular visits to their doctors and taking their medication as prescribed by health professional. Since NCDs are among the most common medical problems seen in medical practice, medical student needs to be aware of the importance health promotion and how to practise it. As it is well known that there is a global epidemic of NCDs, it has been documented that lifestyle behaviour change with initiatives for smoking cessation and physical exercise will reduce risks for NCDs (3). So the role of medical students and other health professional in promotion of people health is essential and will reduce the burden of NCDs on health system.

4 Conclusion

The prevalence of NCDs among the study population was found to be high with hypertension as the most prevalent chronic condition followed by diabetes mellitus and their prevalence was significantly increased with age. The majority of patients had regular follow up in PHC centres and had no complications. There was no significant difference in occurrence of NCDs between males and females in this study. There was no significant difference between family income and presence of NCDs. Medical students had great role in the promotion of health of patients with NCDs by giving health education and advise to patients. The findings of this study may help the authorities in health system in the plans for prevention and control of NCDs in Sudan. Funding to improve the strategy of the PHC courses for the medical students in Gezira university should be encouraged so as to play an effective role in health promotion of patients with NCDs.

Strengths of the study

This is the first community-based study assessing the prevalence of NCDs in Wad-Medani city in central part of Sudan.

Limitations of the study

The study used self-reported of NCDs which may introduce recall and social desirability biases and hence psychiatric and some other diseases like cancer may be hidden by study population as it is considered as social stigma by some people in Sudan.

Compliance with ethical standards

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Disclosure of conflict of interest

All authors have no conflict of interest

Statement of ethical approval

Ethical clearance was obtained from the ethical committee of the faculty of Medicine, University of Gezira before starting the actual data collection.

Statement of informed consent

Verbal consent was taken from participants. Moreover, the confidentiality of information was guaranteed by using code numbers and the data was kept securely locked up. Individuals identified as cases of NCDs received health education regarding their diseases and were advised to have regular follow up with their doctors in the nearby health centres and those with complications or who had irregular follow up were referred to the nearby clinic for further treatment and follow-up.

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