

Assessment of Prevalence of Noncommunicable Diseases among Faculty Staff at University of Gezira, and Associated Risk Factors, Sudan, 2023

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Abstract

Background: Noncommunicable diseases (NCDs), including diabetes mellitus (DM), hypertension (HTN), cardiovascular diseases, cancers, and chronic respiratory diseases, are significant public health concerns worldwide. They account for a substantial portion of global morbidity and mortality, with a particularly sharp rise in prevalence observed in low- and middle-income countries over the past few decades. This study aimed to assess the prevalence of NCDs among faculty staff, the associated risk factors and the impact of these diseases on job performance at University of Gezira, Sudan.

Materials and methods: A cross-sectional study conducted among faculty staff of some of Alrazie campus faculties (Faculty of Medicine, Dentistry, and Pharmacy). A questionnaire was designed by the authors based on previous similar studies, it consisted of various domains that included, demographic data, presence of any chronic diseases (DM, HTN, cardiac disease, cancers, respiratory disease, others), duration of the disease, compliance, diet, complications, risk factors (smoking, obesity, alcohol consumption, tobacco), taking regular exercise or not and the effect of the chronic disease on the job, e.g. absenteeism from work). The questionnaire was distributed to the study population via goggle forum during the period of October-November 2023. A total of 69 staff members responded to the questionnaire. The data was analyzed using SPSS version 22.

Results: The demographic distribution was as follows: The majority 22(31,9%) were in the age group 40-50 years with equal distribution of male and female participants. Most participants were married. Most of the respondents were assistant professors;28 (40.5%). Prevalence rates of chronic diseases was as follows: Diabetes mellitus (DM): 11 (15.9%), hypertension (HTN): 20 (28.9%), cancers:1 (1.4%), respiratory diseases: 10 (14.5%), others: 10 (14.5%). Associated risk factors were: smoking: 7 (10%), obesity: 14 (20%), alcohol consumption:4 (5.8%), tobacco use:11 (15.9%), and irregular exercise:45 (65.2%), only 24 (35%) do regular exercise.

Conclusion: The increasing prevalence of NCDs among faculty staff in academic institutions is a reflection of broader global and national trends. Factors such as aging, lifestyle changes, and urbanization contribute significantly to this rise. There is a need for targeted interventions to address the specific risk factors associated with NCDs in academic settings. Future research should focus on identifying effective strategies for prevention and management of NCDs among faculty members to improve their health outcomes and productivity.

Keywords: Noncommunicable Diseases, Faculty staff, Gezira, Sudan.

Introduction

Noncommunicable diseases (NCDs) are chronic conditions that pose a significant public health challenge globally, especially in low- and middle-income countries. NCDs, including hypertension (HTN) and other cardiovascular diseases, diabetes mellitus (DM), cancer, and chronic respiratory diseases, are responsible for the majority of deaths worldwide [1]. The increasing prevalence of NCDs in these regions is attributed to a combination of aging populations, urbanization, and lifestyle changes [2]. The World Health Organization (WHO) reports that NCDs account for approximately 71% of all deaths globally, with cardiovascular diseases being the leading cause, followed by cancers, respiratory diseases, and diabetes [3]. The burden of NCDs is particularly high in low- and middle-income

countries, where more than three-quarters of NCD-related deaths occur [4]. These conditions not only affect the quality of life but also place a significant economic burden on individuals and health systems [5, 6]. In many low- and middle-income countries, including Sudan, the prevalence of NCDs has been rising steadily. This increase is attributed to factors such as rapid urbanization, changes in dietary habits, reduced physical activity, and increased tobacco and alcohol consumption [7, 8]. Studies have shown that urbanization leads to lifestyle changes that favour the development of NCDs, such as sedentary behaviours and increased intake of processed foods high in sugar and fat [9, 10]. Several risk factors contribute to the development of NCDs, including behavioural, metabolic, and environmental factors. Behavioural risk factors such as

smoking, unhealthy diet, physical inactivity, and harmful use of alcohol are well-established contributors to NCDs [11]. Metabolic risk factors include hypertension, obesity, hyperglycaemia, and hyperlipidemia, which increase the likelihood of developing chronic conditions [12]. Environmental factors, such as air pollution and exposure to hazardous chemicals, also play a role in the aetiology of NCDs [13, 14]. Sudan, like many other low-income countries, faces a dual burden of communicable and noncommunicable diseases. Studies have reported an increasing prevalence of hypertension and diabetes among the Sudanese population reflecting global trends. A study in Khartoum found that the prevalence of hypertension was 24%, while diabetes prevalence was approximately 19% highlighting the impact of lifestyle changes and urbanization. These figures underscore the need for targeted interventions and policies to address the growing burden of NCDs in Sudan (15). A study conducted among the urban population of Wad-Medani city in Gezira state by Sawsan A. Omer et.al. reported high rates of NCDs (20%), out of these, HTN prevalence was 40% and DM prevalence was 35% (16). Another study in the Gezira state found that lifestyle factors such as diet, physical inactivity, and tobacco use were significant contributors to the prevalence of NCDs [17]. Additionally, research has shown that the prevalence of hypertension and diabetes is high among Sudanese adults, with significant implications for public health policy [18]. The rising burden of NCDs in Sudan underscores the need for comprehensive public health strategies to address these conditions [19].

Prevalence of NCDs Among Faculty Staff

There is limited research on the prevalence of NCDs among faculty staff in academic institutions, particularly in low- and middle-income countries. However, available studies suggest that faculty members are not immune to the global trends of rising NCD prevalence. For instance, a study conducted in Nigeria reported a high prevalence of hypertension and diabetes among university staff, attributed to stress, sedentary lifestyle, and dietary habits [20]. Similarly, research in India found that faculty staff exhibited significant rates of obesity, hypertension, and diabetes, emphasizing the need for targeted health interventions in academic settings [21, 22]. In Saudi Arabia, a study reported a prevalence of metabolic syndrome among university employees, highlighting the importance of workplace health programs [23]. The increasing prevalence of NCDs among faculty staff in academic institutions reflects broader global and national trends. Factors such as aging, lifestyle changes, and urbanization contribute significantly to this rise. There is a need for targeted interventions to address the specific risk factors associated with NCDs in academic settings. This study aimed to assess the prevalence and risk factors associated with NCDs, among faculty staff in some of Alrazia campus faculties, University of Gezira, Sudan.

Materials and methods

Study Design and Setting

A cross-sectional study conducted among faculty staff of some of Alrazia campus faculties (Faculty of Medicine, Dentistry and Pharmacy). Alrazia campus is one of the University Gezira (The second largest governmental universities in Sudan) campuses that lies in the centre of Wad-Medani city where Gezira University lies. It consists of faculties of Medicine, Dentistry, Pharmacy, Applied medical sciences, Laboratory Medical Sciences and Computer Sciences.

Study population and Data Collection

The study included all faculty staff from Alrazia campus willing to participate. Exclusion criteria included faculty staff from other campuses and those unwilling to participate. A structured questionnaire was designed by the authors based on previous similar studies.

The questionnaire covered: Demographic Data: Age, sex, residence, marital status, job title, and place of work. Chronic Diseases: Presence of diabetes mellitus (DM), hypertension (HTN), cardiac disease, cancers, respiratory diseases, and others. Disease Details: Duration of the disease, compliance with medication, regular follow-up, diet, and complications. Risk Factors: Smoking, obesity, alcohol consumption, tobacco use, and regular exercise and impact on Job: Effect on job performance, such as absenteeism from work. The questionnaire was distributed via Google Forms in October-November 2023, with faculty representatives responsible for dissemination. A total of 80 responses were received and analyzed using SPSS version 22. A total of 80 staff members responded to the questionnaire. The data was analyzed by using SPSS version 22. Descriptive Statistics was used to calculate the prevalence rates of each chronic disease among faculty staff as well as Logistic Regression to identify any significant associations.

Ethical consideration

Ethical approval was obtained from the ethical committee of the Faculty of Medicine and written informed consent from all respondents and they were assured that all responses will be kept confidential and used solely for the purposes of this study and the anonymity will be maintained throughout the research process.

Results

This cross sectional study was conducted among faculty staff members at Alrazia campus in the University of Gezira, enrolled 69 staff members from faculties of Medicine, Dentistry, and Pharmacy, with response rate of around 30%. The demographic distribution was as follows: The majority 22(31.9%) were in the age group 40-50 years with equal distribution of male and female participants. Most participants were married. Job titles: Included professors, associate professors, assistant professors, and lecturers, most of them were assistant professors;28 (40.5%).

Prevalence Rates of Chronic Diseases

Diabetes mellitus (DM): 11 (15.9%), hypertension (HTN): 20 (28.9%), cancers:1 (1.4%), respiratory diseases: 10 (14.5%), others: 10 (14.5%) as shown in figure 1.

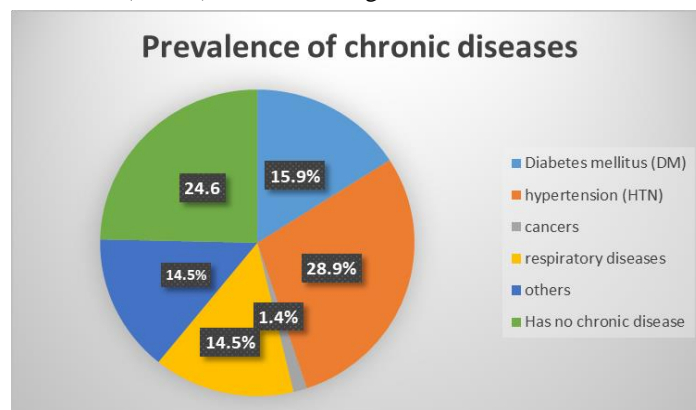


Figure 1: shows the prevalence rates of chronic diseases among participants.

Risk Factors: Smoking: 7 (10%), Obesity: 14 (20%), Alcohol Consumption: 4 (5.8%), Tobacco Use: 11 (15.9%), and irregular exercise: 45 (65.2%), only 24 (35%) do regular exercise as shown in figure 2.

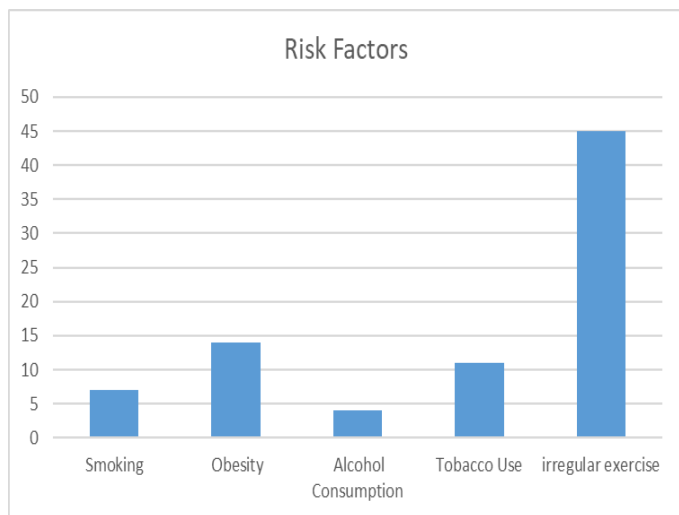


Figure 2: shows associated risk factors with NCDs in the participants.

Correlation Analysis Results

Age and chronic diseases: There is a strong negative correlation between age and the presence of diabetes mellitus, with a correlation coefficient of (-0.66) . This indicates that as age increases, the likelihood of having diabetes mellitus decreases by 66%. There is also a moderate negative correlation between age and the presence of hypertension, with a correlation coefficient of (-0.55) . This indicates that as age increases, the likelihood of having hypertension decreases by 55%.

Compliance and Chronic Diseases: The correlation between diabetes mellitus and medication compliance is weakly positive, with a correlation coefficient of (0.08) . This suggests that patients with diabetes mellitus are 8% more likely to comply with their medication regimen.

The correlation between hypertension and medication compliance is also positive, with a correlation coefficient of (0.17) . This indicates that patients with hypertension are 17% more likely to comply with their medication regimen. The majority (70%) follow-up compliance rates among participants has irregular follow up as shown in figure 3.

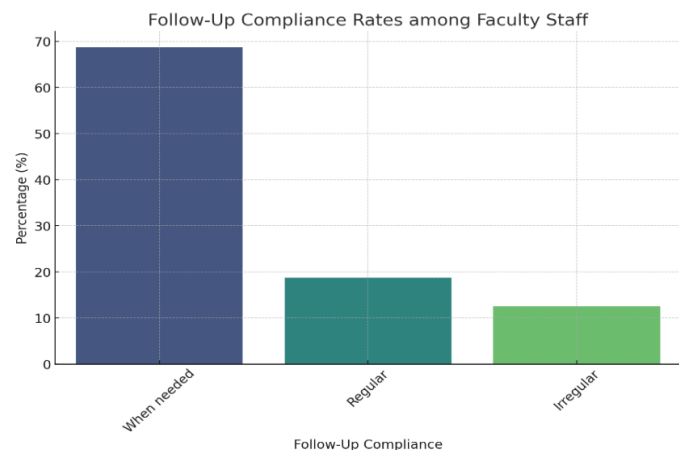


Figure 3: shows follow-up compliance rates among participants.

Exercise and chronic diseases: There is a moderate negative correlation between regular exercise and the presence of diabetes mellitus, with a correlation coefficient of (-0.28) . This indicates that regular exercise reduces the likelihood of having diabetes mellitus by 28%. There is a weak negative correlation between regular exercise and the presence of hypertension, with a correlation coefficient of (-0.19) . This indicates that regular exercise reduces the likelihood of having hypertension by 19%.

Diet Compliance and Chronic Diseases: There is a moderate positive correlation between the intake of fruits and vegetables and the presence of diabetes mellitus, with a correlation coefficient of (0.43) . This suggests that patients with diabetes mellitus are 43% more likely to include fruits and vegetables in their daily diet. There is a moderate negative correlation between the intake of fruits and vegetables and the presence of hypertension, with a correlation coefficient of (-0.30) . This indicates that higher intake of fruits and vegetables reduces the likelihood of having hypertension by 30%.

Compliance and Health Outcomes

Regular Follow-up and Complications: There is a negative correlation between regular follow-up and the presence of complications, with a correlation coefficient of (-0.13) . This suggests that patients who follow up regularly are 13% less likely to report complications.

Medication Compliance and Regular Follow-up: There is a positive correlation between medication compliance and regular follow-up, with a correlation coefficient of (0.19) . This indicates that patients who comply with their medication regimen are 19% more likely to follow up regularly.

Chronic Diseases and Work Performance: There is a strong negative correlation between the presence of diabetes mellitus and its impact on work performance, with a correlation coefficient of (-0.66) . This indicates that the presence of diabetes mellitus is associated with a 66% likelihood of affecting work performance negatively. There is a strong negative correlation between the presence of hypertension and its impact on work performance, with a correlation coefficient of (-0.60) . This suggests that hypertension is associated with a 60% likelihood of affecting work performance negatively. There is a moderate positive correlation between the presence of cancer and its impact on work performance, with a correlation coefficient of (0.36) . This indicates that cancer is associated with a 36% likelihood of affecting work performance negatively. There is a moderate negative correlation between the presence of respiratory disease and its impact on work performance, with a correlation coefficient of (-0.19) . This suggests that respiratory disease is associated with a 19% likelihood of affecting work performance negatively.

Discussion

The study found that the prevalence of noncommunicable diseases (NCDs) among faculty staff at the University of Gezira was significant, with hypertension (28.9%) and diabetes mellitus (15.9%) being the most common conditions. These findings align with global trends where hypertension and diabetes are prevalent among middle-aged and older populations, particularly in low and middle-income countries [24, 25].

University faculty members are a unique population that may experience different stressors and lifestyle factors compared to the general population. Studies in various countries have shown that academic staff are at risk for NCDs due to sedentary lifestyles, high levels of job stress, and irregular eating habits and when comparing the results of this study with similar studies, several interesting observations emerge:

Hypertension Prevalence: A study conducted among university staff in Nigeria reported a hypertension prevalence of 21.3%, which is lower than the 28.9% observed in this study [26]. This discrepancy could be due to differences in lifestyle, dietary habits, and genetic predispositions between the populations.

Diabetes Prevalence: The diabetes prevalence of 15.9% among the faculty staff at the University of Gezira is higher to the findings from a study in Egypt, which reported a prevalence of 9.3% among university employees [27]. Both studies highlight the growing burden of diabetes in African countries, emphasizing the need for targeted interventions to manage this chronic disease. **Cardiac Disease and Other NCDs:** The study found no cases of cardiac disease among the respondents. In contrast, a study among university staff in Kenya reported a prevalence of 3.5% for cardiac diseases [28]. This difference might be attributed to sample size, age distribution, and health awareness levels among the faculty staff.

Regarding Risk Factors: Smoking: The smoking prevalence of 10% in this study is lower than the 15% reported among university staff in Saudi Arabia [29]. This lower prevalence could be due to cultural and religious factors influencing smoking habits in Sudan. **Obesity:** With 20% of the respondents being obese, the prevalence is slightly lower than the 25% reported in a similar study conducted in India among university employees [30]. This difference could be related to varying dietary patterns and physical activity levels. Several risk factors contribute to the development of NCDs among university faculty staff. These include: **Sedentary Lifestyle:** Academic staff often engage in prolonged periods of sitting, contributing to physical inactivity, a known risk factor for NCDs. **Dietary Habits:** Irregular meal patterns and reliance on fast food can increase the risk of obesity, hypertension, and diabetes. **Stress:** Job-related stress is prevalent among university staff, and chronic stress is associated with hypertension and other cardiovascular diseases. **Smoking and Alcohol Consumption:** Tobacco use and excessive alcohol consumption are significant risk factors for various NCDs, including cancers and cardiovascular diseases.

Correlation with Age: The moderate positive correlation between age and the prevalence of hypertension and diabetes indicates that older faculty members are at a higher risk of developing these conditions. This finding is consistent with numerous studies that highlight age as a significant risk factor for NCDs [31, 32].

Compliance and Complications

The study observed that regular medication adherence and dietary compliance were associated with fewer complications and better job performance among the respondents. This emphasizes the importance of continuous medical follow-up and lifestyle modifications in managing NCDs effectively. Similar observations were made in a study conducted in South Africa, where compliance with treatment regimens significantly reduced the incidence of complications among diabetic patients [33].

Impact on Job Performance: NCDs were found to impact job performance, with affected faculty members reporting higher absenteeism rates. This finding is supported by a study in Malaysia, which demonstrated that employees with chronic diseases had higher rates of absenteeism and reduced work productivity [34]. NCDs can significantly impact job performance due to absenteeism, reduced productivity, and increased healthcare costs. Faculty members with chronic diseases may experience frequent medical appointments and illness-related absences, affecting their teaching and research responsibilities. Furthermore, the physical and mental burden of managing chronic diseases can reduce overall job satisfaction and performance. This underscores the need for workplace wellness programs and supportive policies to help manage the health of university staff.

Conclusion

The study found significant prevalence rates of NCDs among faculty staff at the University of Gezira, with hypertension and diabetes being the most common. Age was a significant risk factor, and lifestyle factors such as smoking and obesity contributed to the burden of NCDs. Effective strategies for prevention and management are essential to reduce the impact of NCDs on faculty staff's health and job performance.

Recommendations

Preventive measures and interventions are crucial to managing the burden of NCDs among university faculty. These include:

- **Health Promotion Programs:** Implementing wellness programs that encourage physical activity, healthy eating, and regular health screenings can help mitigate the risk of NCDs.
- **Stress Management:** Providing resources for stress management, such as counselling services and stress reduction workshops, can help faculty members cope with job-related stress.
- **Policy Interventions:** Developing and enforcing policies that promote a healthy work environment, such as smoke-free campuses and access to healthy food options, can support the overall well-being of faculty staff.

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Disclosure of conflict of interest

All authors have no conflict of interest

Ethical approval

Ethical approval was obtained from faculty of Medicine, University of Gezira ethical committee as well as informed written consent from all participants.

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