

**EDITORIAL****Risk Factors of Non-Communicable Diseases Among Populations in Banat Area, Wad Medani City, Gezira State, Sudan 2013**Daniel Tekie Ghebreselasie <sup>1</sup>, Mohammed Elmukthar <sup>2</sup>, Salwa Elsanousi <sup>3</sup>

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**Correspondence:** Daniel Tekie, MD, E-mail address: danddann@yahoo.com.**Abstract:**

The burden of non-communicable diseases is on the rise in middle and low income countries on top of the existing infectious diseases. In Sudan, non-communicable diseases account for a total of (44%) of all deaths. Moreover, the distribution of the specific risk factors are not systematically identified in the Gezira state, hampering the designing of appropriate preventive and control strategies. The objective of this study was to describe the distribution and prevalence of behavioral risk factors for non-communicable diseases. This cross sectional community based study was conducted in Banat area, Wad-Medani, Gezira State, Sudan, in May 2013. Data were collected using structured questionnaire. A total of 380 individuals over 40 years of age were selected for the study by simple random sampling technique. Data were analyzed using SPSS for Windows version (16.0). The distribution of the various categories of risk factors was identified. Among the behavioral risk factors, the prevalence of smoking for males and females were (25.8%) and (2.1%) respectively, alcohol consumption prevalence (1.1%), consumption of fruits and vegetables below adequate level (52.1.0%), low level physical activity (68.4%). All the risk factors were found more prevalent in males than females. This study showed Cigarette /tobacco use and physical inactivity were associated with personal history of NCDs and were found highly statistically significant (p-value <0.005). The study found, half (50%) of the study participants had family history of NCDs. Forty –two percent(42%) of study population had documented personal history of one of the NCDs, of which a combination of (DM+HTN) accounted for (12.6%) of cases followed by diabetes mellitus alone (11.1%). In conclusion, the magnitude of risk factors for noncommunicable diseases is considerably high in the study population. Appropriate preventive measure should be designed to prevent and control these risk factors.

**Key words:** Risk Factors, NCDs, Wad-Medani, Sudan.**Introduction:**

Non communicable diseases (NCDs) are diseases that are not passed from person to person. They are of long duration and generally slow progression. The four main types of non communicable diseases are cardiovascular diseases (hypertension (HTN), heart attacks and stroke), cancers, chronic respiratory diseases (such as chronic obstructive pulmonary disease (COPD) and asthma) and diabetes. <sup>(1)</sup>

Non-communicable diseases (NCDs) and their associated risk factors have emerged rapidly and are becoming a major public health challenge worldwide. The impact of NCDs is devastating in terms of premature morbidity, mortality, and economic loss. <sup>(2)</sup>

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NCDs are mainly associated with four shared behavioral risk factors including tobacco use, unhealthy diets, insufficient physical activity and the harmful use of alcohol. Up to 80% of heart disease, stroke, and adult onset diabetes and 40% of deaths due to cancers could be prevented by eliminating known lifestyle risk factors. (2, 3)

The burden of non communicable diseases (NCDs) and associated risk factors is evident worldwide. NCDs are already disproportionately affecting developing countries at a faster rate than in developed nations, with about 80% of NCD-related deaths (29 million) – now occurring in low- and middle-income countries (LMICs). (4)

The World health Organization (WHO) report on NCDs in Sudan in 2011 indicated that NCDs mortality rate of cardiovascular disease (CVD) of (23%), Cancers (4%), Respiratory diseases (3%), Diabetes (2%), Injuries (13%), and Other NCDs 11%. Heart diseases are an important cause of morbidity and mortality in Sudan. NCDs account for almost forty-four (44%) of all deaths in hospital based studies in Sudan, among which cardiovascular diseases, stroke and hypertension accounts for the top five causes of age- standardized death rates (5). Despite the huge burden of deaths attributed to NCDs, there are not enough nationwide epidemiological studies documented about the prevalence of all behavioral NCDs risk factors. (6)

The main objective of the study was to determine the prevalence of different behavior risk factors associated with Non-communicable diseases among populations in Banat area, Wad-Medan city, Gezira state, Sudan.

### **Material & Methods:**

This descriptive cross-sectional community based study was conducted at Banat area, in May 2013. Banat, is one of the administrative areas of Wad-Medani city which has a total number of families of 700 households. The economic activities of community mainly depend up on private businesses and governmental works incomes. The area has a health center which provides services to residents as well as people in the catchment area of a population of around 3043. Individuals aged 40 to 64 years from both sexes, who were residents at Banat were studied. The sample size was determined based on the WHO STEPS guideline (7). A total of 380 study subjects of age 40 and above and willing to participate in the study were selected by simple random sampling technique.

Data collection instruments for the study were partially adapted from WHO STEPS instruments and translated to local language (Arabic). The instruments were structured and contained questionnaires. The questionnaires comprised questions about socioeconomic and demographic variables and questions for assessing behavioral risk factors for NCDs including cigarette smoking, alcohol drinking, dietary habit, and level of physical activity. The definitions used for risk factors assessed were classified based on the WHO STEPS manual recommendations. Accordingly, any form of tobacco use or alcohol use was considered as an NCD risk factor. Individuals who consumed less than five servings Vegetables/and fruits per day were considered as the „at risk“ group (one cup of raw leafy vegetables or half cup of other vegetables (cooked) was considered one serving. One medium-sized piece of fruit or half cup of chopped fruit was measured as one serving). Physical activity was classified into three groups: (1) inactive when the individual was inactive at work, transport and leisure time, (2) vigorous when the individual had vigorous activity at work, transport or leisure time, and (3) all other individuals were classified as having moderate activity. (7)

A total of 10 medical student interviewers from the University of Gezira, faculty of medicine were recruited and trained on how to obtain consent, ways of administering and filling of the structured questionnaire.

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The data generated were coded, entered, validated and analyzed using statistical package for social sciences (SPSS) for Windows version 16.0 (SPSS Inc.,

Chicago, IL,USA).Background information of study participants was described and prevalence of risk factors of NCDs were determined and presented in tables and figures by percentages. Chi-square test was used to test for significance and P-values below (0.05) were considered statistically significant.

Ethical clearance was obtained from ethical committee of research of the Gezira University and approval from the head of popular committee of the Banat area was obtained.Verbal consent was obtained for participation in the study and confidentiality of respondents' information was maintained at all times.

**Results:**

**1. Socio-demographic characteristics of participants showed the following:** More than one-third (34.2%) of the study participants were in the age range of (40-49), while the least (17.6%) were in the age range of (60-69).

Sex distribution of participants of the study indicated, 204 (54%) were males and 176 (46%) were females. In the present study more than three-fourth (85%) of participants were married while only (9%) were single in their social status. Regarding educational level, (36%) of the respondents had completed secondary school, while (12%) of the respondents had no any formal schooling. While in regard to employment status of participants, Fifty-eight percent (58%) of the respondents were employed; of which (17.9%) were governments' employees and (6.8%) were non-government employees while thirty percent (30%) were house wives. The study shows more than a quarter (27.9%) of study population were from Ja'al tribe, followed by Magarba (16.3%), Jaafra (8.9%) and Danagla (8.9%).

**2. Risk factors of NCDs**

Behavioral risk factors for NCDs assessed through interview were cigarette smoking, alcohol drinking, dietary habit and physical activities. Accordingly the results are shown in the table below. A total prevalence of cigarette/tobacco smokers at the time of the study was (27.9%); and majority (25.8%) were male smokers. Current alcohol consumption in the study population was found (1.1%) and only males accounts for the whole consumption. Poor dietary habits accounted for (52.1%) of the study population. Majority of respondents (68.4%) were physically inactive.

**Table (1): Age distribution of study participants in Banat area, 2013, (n=380)**

<b>Age(years)</b>	<b>Frequency</b>	<b>Percent</b>
40-49	130	34.2%
50-59	113	29.7%
60-69	67	17.6%
≥70	70	18.4%
Total	380	100.0%

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**Table (2): Prevalence of behavioral risk factors of NCDs by sex, Banat, May, 2013, (n=380)**

Risk factors		Sex		Total
		Male	Female	
Use of cigarettes/ and tobacco	yes	25.8%	2.1%	27.9%
	no	27.9%	44.2%	72.1%
				100.0%
Alcohol consumption	yes	1.1%	0%	1.1%
	no	52.6%	46.3%	98.9%
				100.0%
Dietary habits (fruits/and vegetable intake)	Adequate	24.2%	23.7%	47.9%
	Poor	34.1%	22.6%	52.1%
				100.0%
Physical activities	Yes	15.8%	15.8%	31.6%
	No	37.9%	30.5%	68.4%
				100.0%

**Table (3): Cross tabulation of Cigarette /tobacco use and personal history of NCDs, Banat, May, 2013**

Use of Cigarette/ tobacco			Personal History of NCDs		Total
			Yes	No	
	Yes	Count	32	74	106
		%	8.4%	19.5%	27.9%
	No	Count	126	148	274
		%	33.2%	38.9%	72.1%
	Total	Count	158	222	380
		%	41.6%	58.4%	100.0%

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**Table (4): Cross tabulation between physical activities and NCDs among participants, Banat, May, 2013, (n=380).**

			Personal History of NCDs		Total
			yes	No	
Physical activities	Yes	Count	62	58	120
		%	16.3%	15.3%	31.6%
	No	Count	96	164	260
		%	25.3%	43.2%	68.4%
	Total	Count	158	222	380
		%	41.6%	58.4%	100.0%

Cigarette /tobacco use and personal history of NCDs were associated and were highly statistically significant (p-value <0.005).

Association b/n physical inactivity and history of NCDs was found statistically significant (p-value=0.007).

In the present study, Majority of participants (58.4%) do not have any personal types of NCDs. Out of those with NCDs, a combination of (DM + HTN) accounts for (12.6%) cases followed by diabetes mellitus alone (11.1%). Half (50%) of study population had family history of NCDs.

**Discussion:**

The present study shows current Tobacco smoking prevalence of (25.8%) in males and (2.1%) in females, which is comparable to WHO report (2011) of Sudan, which reported, the prevalence of Current daily tobacco smoking among males (24.5%) and females (2.0%)<sup>(5)</sup>. These findings are similar to the WHO estimated smoking prevalence in Africa where population based studies have been carried out.<sup>(8)</sup>

A study conducted by WHO in 2008 showed, the prevalence of daily tobacco smoking varied widely among the six WHO regions. The highest overall prevalence for smoking is estimated at nearly 29% in the European Region, while the lowest is the African Region (8%). The highest prevalence of smoking among men was in the Western Pacific Region (46%) and among women in the European Region (20%). In all regions, men smoked more than women.<sup>(9)</sup>

The fact that considerable proportion of the community was smoking that puts them at higher risk for NCDs clearly demands prompt action. This study showed Cigarette /tobacco use and personal history of NCDs were associated and was found highly statistically significant (p-value>0.005), hence smokers were found to suffer a greater share of the burden of NCDs than non-smokers.

Current smoking was more prevalent among men (25.8%) compared to women (2.1%). Similarly in this study cigarette /tobacco use and male sex was associated and was found highly statistically significant (p-value=0.0). This finding is consistent with findings of other studies in Africa<sup>[10]</sup>. For

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example Agestandardized adjusted estimates of prevalence of current daily cigarette smoking, in males and females showed, in Eritrea (10.3% vs. 0.4%), Uganda, (12.8% vs.2.3%) and Ethiopia (5.5% vs.0.3%) respectively. <sup>(11)</sup>

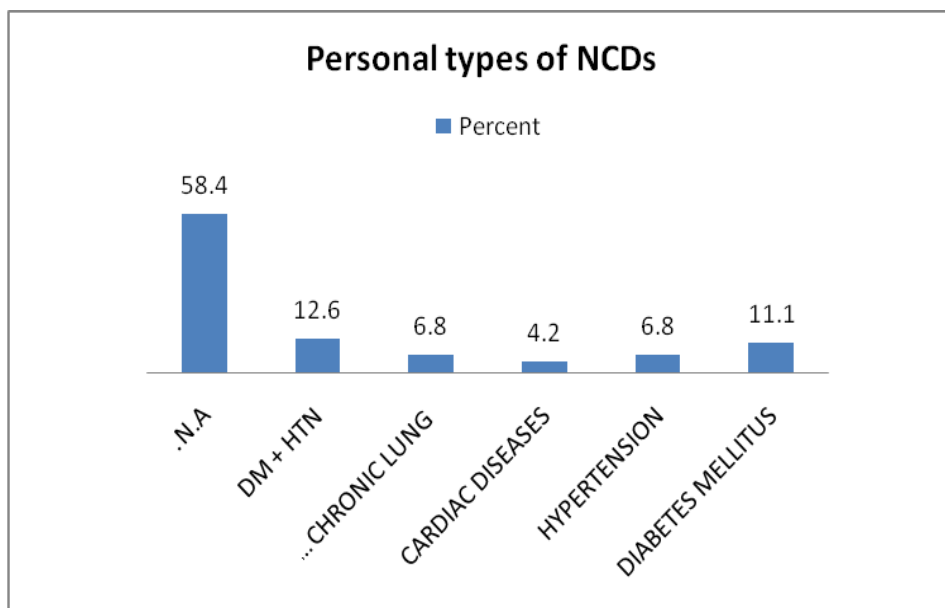


Figure 1: Distribution documented personal History of NCDs among participants, Banat, May 2013, (n=380)

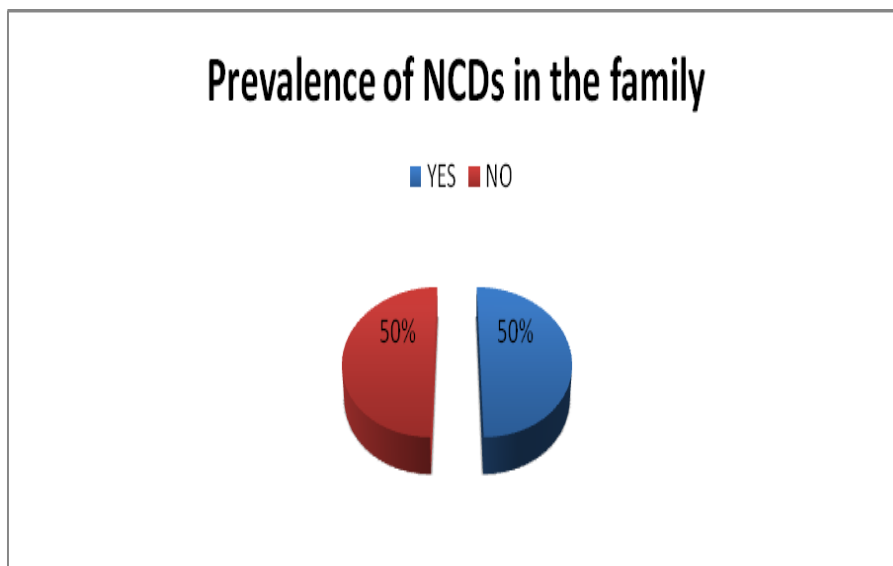


Figure 2: Prevalence of family history of NCDs among participants, Banat, May 2013 (n=380)

Current alcohol consumption in the study population was found very low, prevalence of only (1.1%) and only males account for the whole consumption. A study conducted in Mozambique in the aged group of (25–64) years, it was found that the overall prevalence of current alcohol consumption was (57.7%) among men and (28.9%) in women, indicating a much higher consumption rates than the studied. <sup>(12)</sup>

In a WHO report of comparable projected estimates of adult per capita consumption in liters of pure alcohol in 2008 shows a crude adjusted estimates for both sexes in Sudan of (2.56%). This is much

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lower than the prevalence found in other parts of the world like, Ethiopia (4.10%), Australia(10.21%), china(5.56%), France (12.48%).<sup>(5)</sup>

The lower prevalence of alcohol consumption in the study population could be due to religious beliefs of the participants, in which almost all our respondents were Islam religion followers, in which alcohol consumption is prohibited in the face of holy Quran, as it causes adverse effects to the health of individuals which ultimately leading to chronic illnesses.

Diet and nutrition play a significant role in the prevention of many NCDs such as cardiovascular disease, diabetes, and many forms of cancer. It is suggested that diets high in saturated fat and salt, and low in fruit and vegetables are likely to be associated with the increased risk of heart disease, stroke, obesity and some cancers <sup>(13)</sup>. In the current study, concerning dietary pattern of fruits/ and vegetables, more than half (52.1.0%) of the study population reported to consume fruits and vegetables below adequate level. According to the study conducted by WHO, the prevalence of low fruit and vegetable intake in pooled sample from all the 52 countries of Africa was (78.0%) <sup>(14)</sup>. Another study conducted in South Africa shows the prevalence of a diet low in fruits /and vegetables was (68.5%)<sup>(15)</sup>. In comparison, the figure looks better than the above two studies, but generally more than (50%) the study participants had a lower prevalence of adequate fruit/and vegetable intake. Low consumption of fruits and vegetables probably could be due to the lack of awareness of its benefits especially in urban setting where it is readily available. WHO attributes approximately three million deaths a year from NCDs to inadequate consumption of fruits and vegetable? Consumption of adequate fruits and vegetables not only prevents nutrient deficiency disorders but also reduces the risk of cardiovascular diseases. A study estimated that increased consumption of fruits and vegetables is associated with a (16%) lower risk of cardiovascular disease <sup>(16)</sup>. Dietary habits are often rooted in local and regional traditions. National strategies therefore need to be culturally appropriate and able to challenge cultural influence and to respond change overtime, although promoting healthy diet requires a multi-sectoral approach.

Regarding physical activity, above two-third (68.4%) of study participants were physically inactive. Males account for (37.9%) while females for (30.5%), this study shows male dominance of poor physical activity.

This finding is comparable with other studies done with in the country, although it looks less in number. A recent study in Khartoum showed that (86%) of the population study do not regularly exercise <sup>(17)</sup>. In comparison to other international studies, low level of physical activities is much more prevalent in the current study. A study from Ethiopia in 2009, had found a low level of physical activity (16.9%) among study participants.<sup>(10)</sup> In other similar study, low level of physical activity was reported by (6.8%) of the population in study conducted in India in 2010<sup>(18)</sup>. Hence this puts the study population at higher risk of cardiovascular, strokes and even cancers.

Some of the limitations of this study include, difficulty in gathering some of necessary information about NCDs risk factors due to scarcity of previous researches documented/ published locally, absence of investigations of physical measurement and biochemical analysis for participants, which would otherwise have ascertained the risk factors comprehensively and lack of control groups to compare the cases studied.

## **Conclusion:**

- In conclusion the magnitude of risk factors for NCDs is considerably high in the study population.

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- The magnitude and direction of socioeconomic and demographic inequalities showed different patterns across risk factors.
- The prevalence of risk factors of cigarette smoking and poor physical activities generally increased with age.
- All the risk factors were more common in men than in women.

## **Recommendation:**

- Risk factors for NCDs in this community are high. This study suggests that effective Population based approach programs targeting all age groups and sex using primary health care system for NCDs prevention should be developed.
- The necessity of screening of risk factors among populations using WHO standards and local standards.
- Raise awareness of population about the risk factors and its implications in development of NCDs.
- Importance of developing of family filling system at the health center.
- To conduct further research on determinants of NCDs in the whole city of Wad-Medani.

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