

Original Research

Risk Behaviors for Proactive Health Promotion

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ABSTRACT

Background

Effective, high quality health promotion policy and practice depends on the availability of sound evidence generated from both quantitative and qualitative methods. This study aimed to identify the reasons leading to inappropriate practices and risk behaviors among target populations, and to determine the knowledge and attitude of communities regarding healthy diet, physical activity and body weight.

Methods

A qualitative study conducted by Non-Communicable Disease Directorate, in association with the Public Health Institute, Federal Ministry of Health, Khartoum, Sudan, and covering three states. After grouping the Sudan 18 States into four geographical zones, the State with poorest indicators from each zone was selected. The participants in each State were selected purposefully based on their knowledge and expertise in the area, and stratified according to the residence to urban and rural. A total of 12 focus group discussions, each of 8-10 persons, were conducted using focus group discussion guide. Ethical clearance was obtained from the National Research Ethical Committee and written informed consent was obtained from all participants.

Results

The consumption of vegetables was on a daily basis; but for fruit, consumption was less and depended on accessibility and price. Consumption of whole grain flour was more than refined flour among the respondents and consumption of vegetable oil was more than margarine/butter. Despite the fact that respondents were identified white meat as better to the health, they were found to consume red meat more. There was also high consumption of both white sugar and salt. Although the respondents aware of the benefit of physical exercise, but only a few of them were engaged in regular physical activities. In addition, the respondents aware of the effect of obesity on the health and it is closely linked with diseases, some women believed that obesity is a marker of beauty. Most of the respondents showed their willingness to change towards healthy lifestyles.

Conclusions

This study had shown a high degree of awareness among the respondents about healthy diet, harmful effects of obesity and the benefits of physical activity on the health, although some of them consumed more red meat, white sugar, salt, less fruit, and few of them only engaged in physical activity. The respondents were willing to change their diet and exercise habits if the need arise and if asked to do that by medical doctors.

Keywords

Non-Communicable Disease (NCDs); Risk behaviors; Unhealthy diet; Physical inactivity; Obesity; Lifestyles change.

INTRODUCTION

Non-Communicable Diseases (NCDs) are by far the leading cause of death worldwide and one of the major health

challenges of the 21st century. In September 2011, at the United Nations General Assembly in New York, USA a political declaration was made to strengthen global and national responses to prevent and control NCDs.¹ In 2016, they were responsible for 71% (41

million) of the 57 million deaths, which occurred globally.²

The major NCDs responsible for these deaths included cardiovascular diseases (17.9 million deaths, accounting for 44% of all NCDs deaths and 31% of all global deaths); cancers (9 million deaths, 22% of all NCDs deaths and 16% of all global deaths); chronic respiratory diseases (3.8 million deaths, 9% of all NCDs deaths and 7% of all global deaths); and diabetes (1.6 million deaths, 4% of all NCDs deaths and 3% of all global deaths). An even higher proportion (75%) of premature adult deaths (occurring in those aged 30-69 years) was caused by NCDs, which meant that NCDs are not a problem for older populations. The global probability of dying from one of the four main NCDs in 2016 was 18%, with a slightly higher risk for males (22%) than for females (15%).²

In addition, they are the main cause of death in all World Health Organization (WHO) regions (with the exception of Africa) and most individual countries.³ Although in some countries of the Eastern Mediterranean Region (EMR) the demographic transition has not yet happened, NCDs are responsible for over fifty percent of all deaths. In the Arab World, NCDs were a cause of 55% of all disability-adjusted life years (DALYs), from 41% in 1990.^{4,5}

In Sudan, NCDs cause 50% of all deaths (150,000 deaths per year). Twenty six percent of the populations have a risk of premature death from targeted NCDs.⁶

As part of the declaration, WHO was given a leadership role, and subsequently established the WHO Global Action Plan for the Prevention and Control of NCDs 2013-2020 (Global NCD Action Plan) adopted by the World Health Assembly in 2013.^{1,7,8}

The Global NCD Action Plan included a global monitoring framework and nine voluntary global targets to be attained by 2025.⁷ These targets are aligned to those for NCDs included in the 2030 Agenda for Sustainable Development adopted at the United Nations Summit on Sustainable Development in September 2015 and the WHO 13th General Programme of Work 2019-2023 (GPW 13) adopted by the World Health Assembly in May 2018.⁹⁻¹²

The available data from Sudan were from the few studies conducted; these are the annual health statistic records of the Federal Ministry of Health.¹³ Sudan Household Health Survey,¹⁴ and the WHO STEPwise was study done in Khartoum State,¹⁵ these studies reveal a rising prevalence and an overwhelming impact of NCDs on the Sudan health system.

Effective, high-quality health promotion policy and practice depend on the availability of information from research and evaluation. In Sudan, currently the health promotion department in the process of developing the five-year strategic plan and it is becoming increasingly apparent that evidence is needed for effective health promotion interventions. Many studies have been conducted by the different health programs to determine the

level of knowledge, practices and behaviors of target populations towards major health issues including NCDs. This is in addition to research on determinants of health problems. However, for designating effective health interventions to promote the health of the population, more deep information is needed through qualitative methods to elicit the reasons behind the risk behaviors. As nutrition and physical activity play an important role in the prevention and control of chronic diseases such as hypertension, diabetes and ischemic heart diseases, therefore, there should first be in-depth study and analysis of the current situation regarding unhealthy diet and physical inactivity.

The main purpose of this study is to identify the reasons leading to inappropriate practices and risk behaviors among target populations, and to determine the knowledge and attitude of communities regarding healthy diet, physical activity and body weight in order to design effective interventions that promote the health of the targeted population.

MATERIALS AND METHODS

Study Design and Settings

Federal Ministry of Health, Khartoum, Sudan (Non-Communicable Disease Directorate, and Public Health Institute), conducted a qualitative study, covering three states. The eighteen States of Sudan were grouped into zonal groups. The States in each zone were ranked according to the group of health indicators describing the health problems targeted by the study. The State with poorest indicators from each zonal group was selected.

The selected states were: Northern, Red Sea and Blue Nile States. They are situated in northern; eastern; and southern part of Sudan respectively.

Study Population and Sampling

According to the specific health topic, study participants were selected purposefully by the aid and permission of the local authorities/leaders. Study populations were stratified by area of residence (rural/urban) and by gender and age. A total of 12 focus group discussions (FGDs) were conducted to identify the knowledge, attitude and practices regarding healthy diet and physical activity. Each group had from eight to ten participants, with age group >18 years for both males and females. Two focus group discussions were held with men, one in an urban area and the other in a rural area; the same was carried out with women, giving four focus group discussions in each State.

Demographic Characteristics of the Study Participants

The table below demonstrates the socio-demographic characteristics of the participants.

Table 1. Demographic Characteristics of the Study Participants

Characteristics	Male		Female	
	No	%	No	%
Age group				
18-29	9	16.3	12	21.8
30-39	17	31	15	27.2
40-49	20	36.3	22	40
50-59	6	11	5	9
60 and above	3	5.4	1	2
Marital status				
Single	16	29.1	12	21.8
Married	31	56.5	37	67.3
Divorced	5	9	4	7.3
Widowed	3	5.4	2	3.6
Education				
Illiterate	7	12.7	15	27.3
Basic	12	21.8	24	43.6
Secondary	27	49.1	14	25.5
University	7	12.8	2	3.6
Post graduate	2	3.6	0	0
Income				
Low	32	58.2	34	61.8
Middle	15	27.3	17	31
High	8	14.5	4	7.2

Technique of Data Collection

All FGD members were informed of the ground rules before starting the discussions. Participants were advised to:

- Respect the privacy of the others;
- Only one allowed to speak at a time to ensure that the opinions of others could be heard;
- Allow everyone an equal time to participate in the discussions;
- Encourage participants to share in the discussion.

The guiding and probing points were developed based on the outcome of the review of the available literature, and they covered all the areas in order to achieve the proposed objectives; The frequency of eating fruit and green salad/vegetables (raw or cooked); the frequency of drinking fruit juices; number of servings of vegetables usually eaten/day; type of meat consumed mostly; type of meat that is better for the health and mention the reasons; type of flour (whole grain or refined) you usually consume in the bread and other types of local food that flour is used in; type of oil used for cooking and the frequency of usage of butter for cooking, and the effect of butter/animal fat on health; opinions on vegetable oil and butter; the amount and the way the white sugar used (in the tea and other drinks); amount of salt in average added to the food per day (in tea-spoons); the frequency of engaging in physical activities/day or /week, and whether it is intentional for exercise or as part of the daily activities. The benefits of physical exercise to health. The effect of obesity on health, and the preferred channels

of information about health issues.

A very simple local and understandable language was used for a structured conversation to obtain in-depth information concerning each participant. The discussions in each group took between 90-120 minutes. With each group, the researcher began by introducing him/herself and explaining carefully and clearly the objectives of the discussion. He/she checked that the participants felt comfortable with what was going to be discussed, and asked them to introduce themselves and ensured that they were willing to participate.

The data collectors coordinated and guided conversations by ensuring that all opinions were reported and that the participants restricted their comments to the desired information.

All varieties of topics were discussed with FGD participants to achieve the objectives of the study.

Data Analysis

The reports of discussions were transcribed verbatim. The results were analyzed manually. The analytical approach involved grouping together similar responses using different colors for the different FGDs for easy comparison of themes across groups. Similar concepts were grouped together to form common themes, and each occurrence was labeled as it occurs. The frequencies of similar words or phrases were noted to assist with identifying important themes.

Ethical clearance for the study was obtained from the National Research Ethical Committee, and written informed consent was obtained from all participants of the study.

RESULTS

Diet

Vegetables and fruit consumption: The pattern of vegetables consumption was similar in the three states, for almost all the respondents are consumed vegetables daily, cooked or in the form of fresh salad. The types of vegetables consumed usually differ according to the season.

For those not consuming vegetables on a daily basis, the reason was unavailability of daily local markets for vegetables.

Regarding fruit consumption, the pattern was also similar in the three states. The consumption varies from daily to rarely. The reason for the low consumption was the high price of fruits compared to vegetables.

Preferred and consumed type of meat: The most consumed types of meat were sheep and beef meet in Northern and Blue Nile States, and goats meet in the Red Sea State, camel meat was commonly used in the Northern and the Red Sea States.

Although respondents in all States identified white meat –fish specifically–as the best type of meat for the health, fish was the least consumed meat even in the Red Sea State.

The type of consumed flour: In the Blue Nile and Red Sea States, households consume whole grain local corn flour in the form of porridge (locally known as Kisra), while in the Northern State; households mainly consume bread made of whole grain wheat flour. Bread made of refined wheat flour was the least consumed type and mainly consumed in the Northern State.

Preferred and consumed type of oil: In all states, vegetable oil is used for cooking and as a salad dressing. Butter or margarine are not used for cooking but are added in small amounts to the dish after it is ready. However, women and men, especially in the Red Sea and Blue Nile States think that butter/margarine is better for the health more than vegetable oil because it is made from milk and it tastes better.

Consumption of white sugar: The majority of respondents from all states add sugar to tea or coffee, the amount added ranged from one teaspoon up to six spoons. Only a few respondents do not add sugar to their drinks. Some of the women add sugar to the pot of tea before serving it to the family members, while some put the sugar in a separate pot and serve the tea without sugar. The majority of the respondents from the Northern State stated that they would never consider drinking tea or coffee without sugar or other types of sweeteners (dates).

Respondent in the Red Sea and Blue Nile States said they would consider having their drinks without sugar if it is not available, or in case of ill health, diabetes or old age.

Consumption of salt: Regarding salt consumption, women in all States do not follow standard measurements; they add salt to the whole food pot in “suitable” amounts depending on their experience. Only when some family members have high blood pressure would they reduce the amount of salt added to the food.

The effect of butter/animal fat on health: In the opinion of all respondents from the Northern State, consumption of butter or margarine is harmful to the health. They think that it leads to high cholesterol level and blockage of arteries in addition to obesity. On the other hand, most of the respondents from the Red Sea and Blue Nile States think that butter and margarine consumption is useful to the body. They think that it improves health, strengthens the body and facilitates childbirth.
“Our ancestors had good health because they used to drink margarine”.

Physical Activity and Exercise

The majority of the respondents from all States did not engage in regular physical activities with the purpose of exercising. However, they considered walking to achieve different work or social tasks as an exercise, they also considered the activities they perform at the house or work place as exercise. Those who engaged in physical activities with the purpose of exercise were entirely males and

mostly from the Red Sea State.

The benefits of physical exercise to the health: In the opinion of the respondents from all states, exercise is useful to the body because *“it improves blood circulation”*, *“makes the person more active”*, *“prevents and reduce obesity”* and *“builds the body muscles”*.

Obesity

It seems that respondents to some extent aware of the effect of obesity on health. Participants mentioned that obese people were less active and easily became tired. As well, the majority of participants linked obesity with diseases of blood vessels, joints and limbs problems, hypertension, diabetes mellitus and to the general appearance of the person. Women (particularly in Red Sea State) believed that obesity is a marker of beauty.

Possible Role

Communities in Sudan are willing to change diet and exercise habits. Yet this commitment seems conditional: *“We are willing to change diet and exercise habits if the need arise”* and *“We are obliged to comply with doctors decisions”*.

The knowledge and skills obtained from the study communities were from different sources. Participants order communication channel as follows: Radio, Television, face-to-face communication, newspapers and pamphlets. They also obtained their knowledge from health care providers and internet and mobile messages. School were listed as a source of knowledge.

DISCUSSION

Sudan does not have a surveillance system for NCDs and NCD risk factors but has only a few scattered studies. This is due to difficulties in the health information system and lack of research resulting from the shortage of human and financial resources.¹⁶

In contributing to an understanding of health risk behaviors in Sudan, the present study examined the distribution of selected health risk behaviors among the communities of the targeted states.

Dietary Pattern

WHO recommended at least 400 g (i.e. five portions) of fruit and vegetables per day excluding starchy roots.¹⁷

In this study, the respondents maintained a daily intake of vegetables either fresh or cooked. However, it was difficult to quantify the amount consumed per person, because eating directly from a common dish, is the traditional practice of many people in Sudan.

Consumption of fruits was not as frequent as that of vegetables and it depended on the seasonally available types of fruit and its price. In these communities due to the lack of facilities

of transport and storage, people depend on locally produced vegetables and fruits.

Researches showed that greater perceived access was associated with higher increases in fruit and vegetable consumption, and the price was a contributing factor in individual food choices.¹⁸

Compared with Sudan STEPwise survey done in 2016, the healthy diet recommendation of consuming 5 portions of vegetables and fruits combined, was not met by 94.7% of the population. Fruits are consumed on average on 1.9 days per week and vegetables on 4.0 days per week. Darfur, Khartoum, Northern and Central regions had a mean number of days of consumption of fruit greater than the national average of 1.9 days.¹⁹

In November 2014, WHO organized, jointly with the Food and Agriculture Organization of the United Nations (FAO), the Second International Conference on Nutrition, adopted Declaration on Nutrition,²⁰ and the Framework for Action,²¹ which promote diversified, safe and healthy diets at all stages of life.

Regarding the red meat, results from two large prospective cohorts of US men and women, found that a higher intake of red meat was associated with a significantly elevated risk of total cardiovascular disease (CVD), and cancer mortality and this association was observed for unprocessed and processed red meat, with a relatively greater risk for processed red meat. Substitution of fish, poultry, nuts, legumes, low-fat dairy products, and whole grains for red meat was associated with a significantly lower risk of mortality. Red meat is a major food source of protein and fat, and its potential associations with risks of diabetes mellitus,²² CVD,²³ Cancer,²⁴ and mortality,²⁵ have attracted much attention.

In addition, CVD mortality, previously reported that red meat intake was associated with an increased risk of coronary heart disease.^{23,26}

In this study, although most of the respondents reported that white meat (fish) is better for the health compared to red meat, the consumption pattern was in favour of red meat. This could possibly be due to availability of the red meat, although white meat has fewer prices than the red one.

Amount and type of oil used: To avoid unhealthy weight gain, total fat should not exceed 30% of total energy intake.^{17,27,28} Intake of saturated fats should be less than 10% of total energy intake, and intake of trans fats less than 1% of total energy intake, with a shift in fat consumption away from saturated fats and trans fats to unsaturated fats,²⁸ and towards the goal of eliminating industrially-produced trans fats.^{29,30}

In this study, despite most of the participants reporting to use vegetable oil, some respondents perceived margarine/ butter to be better to the health than vegetable oil, because it is of animal origin.

Sudan STEPwise survey done in 2016 found that 99.5%

of the participants used vegetable oil for cooking and preparation of meals. No household uses margarine or butter for meal preparation.¹⁹

Whole grains (e.g. unprocessed maize, millet, oats, wheat and brown rice), are part of the healthy diet recommended by WHO, and they are helping to protect against NCDs, such as diabetes, heart disease, stroke and cancer.

Furthermore, refined grain products contain more starch but substantially lower amounts of dietary fiber, essential fatty acids, and phytochemicals.

An important finding in this study, the consumptions of whole grain flour was found to be high, and the refined wheat flour was found to be rarely used.

For the effect of salt, in May 2018, the Health Assembly approved the 13th General Programme of Work (GPW13), which will guide the work of WHO in 2019-2023. Reduction of salt/sodium intake and elimination of industrially-produced trans fats from the food supply are identified as part of WHO's priority actions to achieve the aims of ensuring healthy lives and promote well-being for all at all ages.¹¹

Salt, sodium: Reducing salt intake to the recommended level of less than 5 g per day could prevent 1.7 million deaths each year.³¹

Most people consume too much sodium through salt (corresponding to consuming an average of 9-12 g of salt per day) and not enough potassium (less than 3.5 g). High sodium intake and insufficient potassium intake contribute to high blood pressure, which in turn increases the risk of heart disease and stroke.^{32,33}

In this study, women in all states do not follow standard measurements for the consumption of the salt; they added it to the whole food pot in "suitable" amounts depending on their experience. Only when some family members have high blood pressure, they reduce the amount of salt added to the food.

Compared with Sudan STEPwise survey 2016 for salt consumption, although (87%) of participants thought that consuming too much salt could cause serious health problems and (91.8%) were aware that it was important to reduce salt intake, nevertheless (32.4%) added salt or salty sauce to their food before eating. Measured salt in urine was 8.2 gram of sodium in Khartoum state.¹⁹

Regarding the usage of sugars, there is a recommendation that, less than 10% of total energy intake from free sugars,^{17,34} which is equivalent to 50 g (or about 12 level teaspoons) for a person of healthy body weight consuming about 2000 calories per day, but ideally is less than 5% of total energy intake for additional health benefits.³⁴

Excess calories from foods and drinks high in free sugars also contribute to unhealthy weight gain, which can lead

to overweight and obesity. Recent evidence also shows that free sugars influence blood pressure and serum lipids, and suggests that a reduction in free sugars intake reduces risk factors for cardiovascular diseases.³⁵

Free sugars are all sugars added to foods or drinks by the manufacturer, cook or consumer, as well as sugars naturally present in honey, syrups, fruit juices and fruit juice concentrates.

In this study, the majority of respondents from all states add sugar to tea or coffee, the amount added ranged from one teaspoon up to six spoons. Some of the women add sugar to the pot of tea before serving it to the family members.

The majority of the respondents from the Northern State stated that they would never consider drinking tea or coffee without sugar or other types of sweeteners (dates).

The results of Sudan STEPwise survey 2016 found that the average number of days in which respondents consumed soft drinks and/or manufactured juices is 1.2 days per week. On average all participants and among all age groups, consume 6.3 teaspoons of sugar daily.¹⁹

Physical Activity (PA)

WHO defined physical activity (PA); as any bodily movement produced by skeletal muscles that require energy expenditure. WHO recommends doing at least 150 minutes of moderate-intensity physical activity per week or equivalent.

Studies revealed that lack of PA during childhood and youth may lead to cardiovascular disturbances and progression of atherosclerosis that could contribute to the development of CVD in adulthood. Indeed, organizations and governments have identified a population-wide promotion of a healthy lifestyle including PA in young people as a key priority for primordial prevention of CVD.³⁶

In this study, the respondents were aware of the benefits of exercise on health. Although only a few of the participants claimed to be engaged in physical activity with the purpose of the exercise, the majority of them were not engaged in regular exercise and considered their daily chores at home or the workplace as an exercise.

In addition, physical inactivity is also driving the increasing magnitude of NCDs. People who are insufficiently physically active have an increased risk of all-cause mortality, compared with those who engage in at least 30 minutes of moderate-intensity physical activity most days of the week. Added to these, physical activity lowers the risk of stroke, hypertension and depression.³⁷

Participation in 150 minutes of moderate physical activity each week (or equivalent) is estimated to reduce the risk of ischaemic heart disease by approximately 30%, the risk of diabetes by 27%, and the risk of breast and colon cancer by 21-25%.³⁸

The 2016 Sudan STEPwise survey revealed that overall 14.1% of Sudanese (11.4% men and 17.3%) do not engage in the recommended amount of physical activity. There was a great variation of insufficient PA among the regions (Kordofan 8.1% and Northern 20.8%). Inactivity was higher among urban (18%) than rural (11.6%) respondents.¹⁹

Overweight and Obesity

Other serious risk factors, is overweight and obesity; In 2016, more than 1.9 billion people aged 18 and older were overweight (a person whose BMI is greater than or equal to 25), with more than 650 million considered obese (one with a BMI ≥ 30).

Obesity is not solely an issue for adults: in 2016, 340 million children and adolescents aged 5-19 years, and around 40 million children under the age of 5 years, were considered overweight or obese.³⁹

Gaining excess weight in childhood and adolescence is associated with an increased likelihood of obesity, type 2 diabetes, and premature death in adult life.⁴⁰

Moreover, obesity is linked to an increased risk of hypertension, many NCDs (such as diabetes, coronary heart disease, stroke, and cancers), and conditions including obstructive sleep apnoea and osteoarthritis.⁴⁰ Between 1975 and 2016, the worldwide prevalence of obesity nearly tripled and continues to rise in low- and middle-income countries, although it was once considered a problem of high-income countries.³⁹

In this study, the respondents had shown a high degree of awareness about the harmful effects of obesity on the health, and the majority of them link obesity with diseases of blood vessels, joints and limbs problems, hypertension, diabetes mellitus. In contrast, women (particularly in Red Sea State) saw obesity as a marker of beauty.

Sudan STEPwise survey 2016 results revealed that 28.3% of Sudanese adults are either overweight or obese with the percentage being greatly higher in women (35.6%) than men (22.6%).¹⁹

There is convincing evidence that nutrition and physical activity play an important role in the prevention of chronic diseases such as hypertension, diabetes and ischemic heart diseases.⁴¹

The respondents to this study claimed they would adopt a healthy diet and lifestyle if they developed a health condition that requires this change, which indicated that a health promotion program, is strongly recommended.

In this study, although most of the respondents reported that white meat (fish) is better for health compared to red meat, the consumption pattern was in favor of red meat. This could possibly be due to the availability of red meat, although white meat has fewer prices than the red one.

Study's strengths: Prevention and control of NCDs is one of the policy foundations of Sudan's National Strategic Plan for the health sector (2003-2027), so the results of this study, which elicited the reasons behind the risk behaviors among the targeted group, will be used for designating effective health interventions to promote healthy lifestyles among the population. In addition, we can contribute much to the achievement of Sustainable Development Goals, especially in the area of health system strengthening.

Study's weaknesses: In Sudan, there are many tribes with different cultures and behaviors, in order to develop a strong health promotion program for lifestyle changes, the study should cover all the zones of Sudan, but our main obstacles are the resources (both finance and human) In addition, this study did not cover people below 18 years, although health promotion interventions is extremely needed among this group, so more researches are needed to fill these gaps.

CONCLUSION

This study had shown a high degree of awareness among the respondents about healthy diet, harmful effects of obesity and the benefits of physical activity on the health, although some of them consumed more red meat, white sugar, salt, less fruit, and few of them only engaged in physical activity.

The respondents were willing to change their diet and exercise habits if the need arise and if asked to do that by medical doctors.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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