



Community perception and knowledge on the Management and Prevention of Metabolic Syndrome: The Case of Bamenda Health District, North West Region, Cameroon

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Abstract

Introduction: The prevalence of the key determinants of metabolic syndrome (MS); hypertension, diabetes, elevated body mass index, dyslipidaemias, and central obesity are on a steady rise due to the westernization of diets and adoption of more sedentary lifestyles, all favoured by a rural to urban migration.

Objective: The objective of this study was to assess the perception/knowledge of metabolic MS, risk factors, management, and prevention of MS in the Bamenda Health District.

Methods: The study was a cross-sectional study where data was collected at a point in time, from January 2023 to April 2023. The study targeted 565 adults' population aged 18-89 years old living within the Bamenda Health Districts and an interview guide was used for data collection. Data analysis was done using the statistical package for social sciences (SPSS).

Results: Most of the study participants (45.5%) could identify conditions like obesity, hypertension, and high blood sugar, which are risk factors for metabolic syndrome. A majority (48%) of the respondents had no idea about metabolic syndrome and did not know that MS affects someone through the presence of obesity, high blood pressure, and high cholesterol in the blood combined. For gender, age group, and education, the differences were statistically significant ($P < 0.05$). The respondents (49.4%) understand that daily physical activity for a minimum of 30 minutes or 60 minutes if overweight can prevent the risk of getting hypertension, obesity, and diabetes, while others (35%) did not.

Conclusion: The study demonstrated poor knowledge /awareness of MS in the Bamenda Health District, with a representative population of the North West Region of Cameroon. Persuasive education is needed to improve adherence to a healthier to increase awareness and improve the lifestyle of the population on metabolic syndrome and its driving factors.

Keywords: Metabolic Syndrome, perception, community, management, prevention, Bamenda, Cameroon, health district

Introduction

In Cameroon, few studies have been done on Metabolic Syndrome and/or its individual components in (Centre region [1], Littoral region [2], Western Region [3] and Far North Region) but no published research has been done on metabolic syndrome in the North-West Region of Cameroon, especially on knowledge and perception of the population on MS. Clinical identification and management of patients with the MS are important to begin efforts to adequately implementing the treatments to reduce their risk of subsequent diseases [4]. Effective preventive approaches include lifestyle changes, primarily weight loss, diet, and exercise, whereas treatment comprises the appropriate use of pharmacological agents to reduce the specific risk factors. Pharmacological treatment should be considered for those whose risk factors are not adequately reduced with the preventive measures and lifestyle changes [5]. The clinical management of MS is difficult because there is no recognized method to prevent or improve the whole syndrome, the background of which is essentially insulin resistance [6]. Thus, most physicians treat each component of MS separately, laying a particular emphasis on those components that are easily amenable to the drug treatment. In fact, it is easier to prescribe a drug to lower blood pressure, blood glucose, or triglycerides rather than initiating a long-term strategy to change people's lifestyle (exercise more and adopt a healthy diet) in the hope that they will ultimately lose weight and tend to have a lower blood pressure, blood glucose, and triglycerides. For the treatment of risk factors of MS, the physician should follow the current treatment guidelines of the National Cholesterol Education Programme (NCEP) [7], the seventh Joint National Commission (JNC-VII) for blood pressure treatment [8], the American Diabetes Association (ADA) [9], the American Heart Association (AHA) [10], and the National Institute of Health Obesity Initiative [11]. The underlying conditions that promote the development of MS and diabetes mellitus are overweight and obesity, physical inactivity, and an atherogenic diet (12). Therefore, lifestyle modification is first-line therapy to prevent and treat MS. This study was therefore carried out to determine the community perception and knowledge on the management and prevention of MS to develop educational program that could change their mind-set and lifestyle, and therefore reduce the risk of suffering from metabolic syndrome.

Materials and methods

The study area was in the 13 health areas of the Bamenda Health District, where the main activity in the urban area is commerce and other sedentary occupations as opposed to the rural area where the main activity is farming. A population-based cross-sectional home survey was performed from July 2022 to April 2023 in a randomly selected adult urban population of Bamenda, North-West Region of Cameroon, targeted adults aged 18-89 years old living within the Bamenda Health Districts.

The sample size was obtained using the LORENZ formula ($Z^2P(1-P) / e^2$) [13], giving a sample size of 565 participants for the study. Simple random sampling of participants was done from home to home with the use of an interview guide. Data analysis was done using SPSS version 25.0. Descriptive statistics was obtained for different qualitative variables. Chi-square (χ^2) analyses was also conducted to determine any existing relationship with the demographic variables.

For ethical consideration, the study protocol was approved by the University of Bamenda Ethical Committee (2022/0705H/UBa/IRB), as well as administrative clearance from the regional delegation of public health, for North-West Region. Consent of respondents was obtained, and confidentiality was maintained by assigning codes to the participants.

RESULTS

Demographic characteristics of the study population

In total 565 persons were surveyed with 100% participation rate. The mean age of respondents was 30.73. Majority of the respondents were within the age group of 18-27, followed by those aged 28-37.

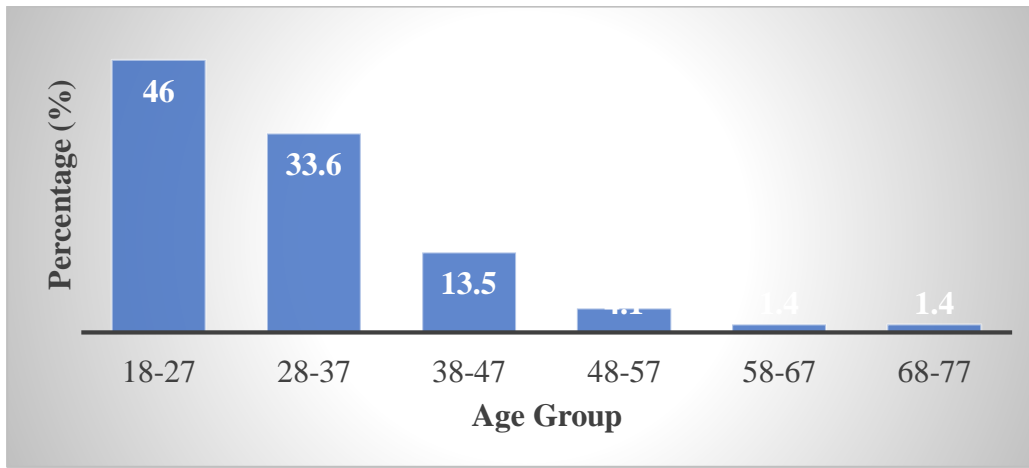


Figure 1: Distribution of age group of respondents

The result of gender distribution shows more females (54.7%) than males (44.2%) respondents who participated in the study ($P < 0.001$).

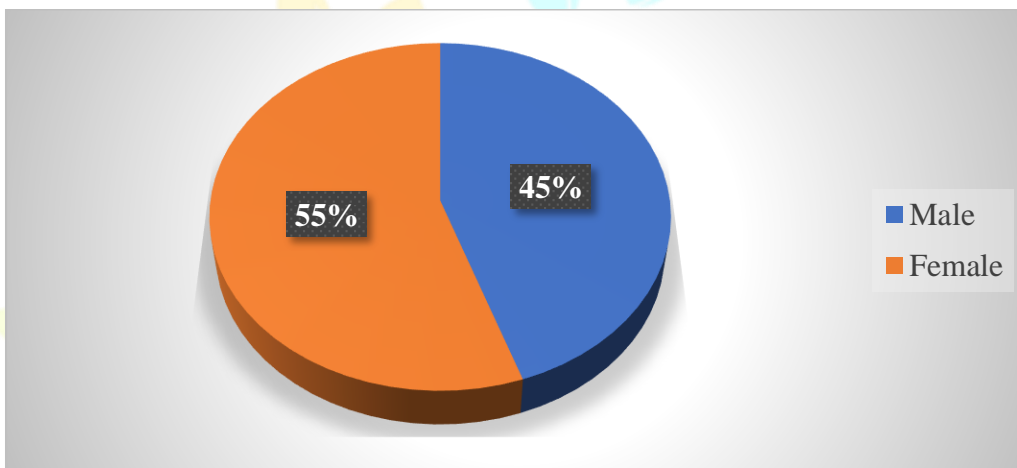


Figure 2: Distribution of respondents by gender

Most of the participants were those with secondary school level of education (42.8%), followed by those with University education (35.2%) ($P < 0.001$). According to the age groups, those aged 18-37 years dominated the study population.

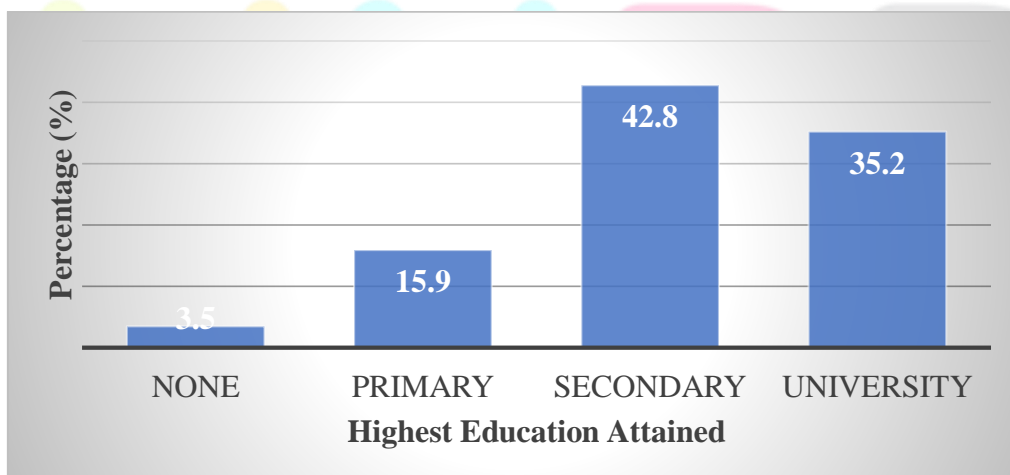


Figure 3: Distribution of respondents by highest level of education

Majority of the participants were businesspersons (38.9%), followed by office workers (16.3%) ($P = 0.001$).

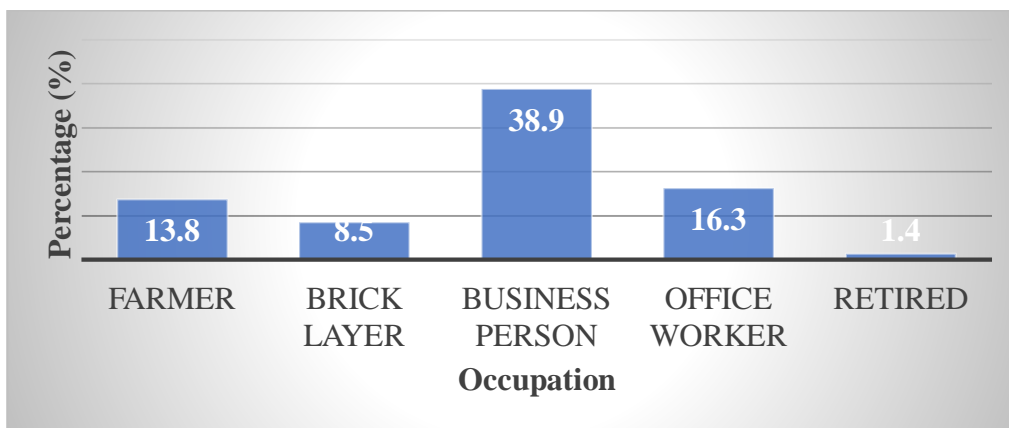


Figure 4: Distribution of occupation of respondents

Perception/knowledge of population on metabolic syndrome and its management

Out of the 565 respondents, 373 (66%) of the respondents had no idea what metabolic syndrome is, and only 84 (14.9%) confirm that metabolic syndrome could be a group of sickness that can lead to heart disease, diabetes, and stroke (Table II). About 48% tried to suggest that MS is equal to the presence of obesity, high blood pressure and high cholesterol in blood all combined. Still 190 (33.6%) of the respondents had no idea about the way MS affects someone. For causes of MS, those who had some ideas (35.9%) were far less than those who had no idea. (41.8%). Only 33.6% of the respondents could identify ethnic groups and age as other factors associated with hypertension, obesity and conditions that are risk factors of MS. Only 38.8% of the respondents thought that the following groups of persons could be at high risk of suffering from metabolic syndrome; elderly persons above 65 years, those with high blood pressure, high blood sugar, and high LDL cholesterol in blood as well as those with obesity. Though 50.4% of the respondents understood why these groups of persons are at risk of metabolic syndrome, as many as 35.4% of them did not understand the reason of those groups being at risk. Majority of the respondents (58.2%) confirmed that too much weight may lead to metabolic diseases in the system like diabetes and other heart diseases (51.2%). Most of the respondents confirmed that there is a close association between physical activity and sickness in our system (50.1%) and that physical activity reduces risk of diseases like diabetes (46.5%).

Table II: Distribution of population perception/knowledge on metabolic syndrome

Variable (n=565)	Frequency	Percentage
Meaning of metabolic syndrome (MS)		
It is a combination of other sickness that can lead to heart disease, diabetes, and stroke	84	14.9
Risk factor of diabetes mellitus	82	14.5
Combination of different chemicals in the body	26	4.6
I don't know about it	373	66.0
The way MS affects someone		
Obesity, high blood pressure and high cholesterol in blood	271	48.0
No symptoms	32	5.7
I do not know	262	46.3
Causes of Metabolic Syndrome		
Increased blood pressure, high blood sugar, excess body fat around the waist	203	35.9
Eating too much	126	22.3
I do not know	236	41.8
Groups of people high risk of MS		
Elderly persons above 65 years	84	14.9

Those with high blood pressure, high blood sugar, high cholesterol in blood	106	18.8
Those with Obesity	28	5.0
All the above	219	38.8
I do not know	128	22.5
Reasons for being at risk		
Those conditions can lead to Diabetes and heart diseases	285	50.4
I do not know	200	35.4
Too much weight lead to Diseases in the system like high blood and obesity		
Am aware of it	329	58.2
I do not know	236	41.8

The relationship between perceptions of metabolic syndrome and demography

In terms of gender, there were more females than males. The difference was statistically significant for the meaning of metabolic syndrome ($P=0.050$), other factors associated with metabolic syndrome ($P=0.038$) and groups of people at high risk of metabolic syndrome ($P=0.001$). For age groups, those aged 18-27 years old were more aware of metabolic syndrome than the other age groups, followed by those aged 28-37. According to the result, the perception on metabolic syndrome decreases with increase age. The difference was statistically significant only for the meaning of metabolic syndrome ($P=0.001$). The differences for other variables were not statistically significant ($P>0.05$). For qualifications, perception/knowledge increases with increased level of education. The differences were statistically significant ($P<0.001$) (Table III).

Table III: Distribution of perception of metabolic syndrome in relation to demographic information

Variable	Gender		P Value
	Male	Female	
Meaning of metabolic syndrome (MS)	98 (49.2%)	97 (48.7%)	0.198
The way MS affect someone	114 (42.1%)	157 (57.9%)	0.052
Causes of Metabolic Syndrome	80 (39.4%)	123 (60.6%)	0.111
Other factors associated with MS	82 (43.2%)	106 (55.8%)	0.038*
Groups of people high risk of MS	96 (43.8%)	123 (56.2%)	0.001*

Variable	Age Group						P Value
	18-27	28-37	38-47	48-57	58-67	68-77	
Meaning of metabolic syndrome (MS)	123 (47.9%)	84 (32.7%)	36 (14%)	10 (3.9%)	02 (0.8%)	02 (0.8%)	0.001*
The way MS affect someone	127 (46.9%)	87 (32.1%)	34 (12.5%)	15 (5.5%)	04 (1.5%)	04 (1.5%)	0.080
Causes of Metabolic Syndrome	99 (48.8%)	61 (30%)	29 (14.3%)	8 (3.9%)	04 (2%)	02 (1%)	0.146
Other factors associated with MS	73 (38.4%)	85 (44.7%)	22 (11.6%)	6 (3.2%)	4 (2.1%)	0 (0.0%)	0.058
Groups of people high risk of MS	92 (42%)	85 (38.8%)	24 (11%)	8 (3.7%)	6 (2.7%)	4 (1.8%)	0.252

Variable	Qualification				P Value
	None	Primary	Secondary	University	
Meaning of metabolic syndrome (MS)	2 (0.8%)	26 (10.1%)	102 (39.7%)	119 (46.3%)	<0.001*
The way MS affect someone	6 (2.2%)	24 (8.9%)	108 (39.9%)	131 (48.3%)	<0.001*

Causes of Metabolic Syndrome	4 (2%)	22 (10.8%)	90 (44.3%)	83 (40.9%)	<0.001*
Other factors associated with MS	2 (1.1%)	30 (15.8%)	74 (38.9%)	82 (43.2%)	<0.001*
Groups of people high risk of MS	4 (1.8%)	24 (11%)	104 (47.5%)	83 (37.9%)	<0.001*

* Statistically significant

The results for the management of MS are given in Table IV. According to the respondents, physical activity reduces the health risk associated with metabolic syndrome (56.1%) and that is because it controls diabetes, blood pressure and obesity (40.2%). The respondents also agreed that problem in the system can be managed by controlling your blood glucose, cholesterol, and blood pressure (50.8%), through physical activities (23.7%), though 30.8% had no idea. They also identified losing weight to reduce risk of MS and risk of heart disease (59.3%). According to the respondents, follow up on the advice given on lifestyle reduces the risk and prevent MS (51.9%) and this follow up must be done all the time or continuously (48.7%) and by eating everyday according to the prescribed style (46.9%). The results on Table IV show very limited knowledge and perception on the management of MS.

Table IV: Distribution of population perception on the management of metabolic syndrome

Variable	Frequency	Percentage
Doing physical activity reduces the health risk associated with metabolic syndrome		
Correct	317	56.1
Wrong	48	8.5
Do not Know	200	35.4
If correct, how it helps		
It controls diabetes, blood pressure, and obesity	227	40.2
Makes you slim	62	11.0
Makes you look good	40	7.1
I do not know	236	41.7
Problem in the system can be managed by managing blood glucose, cholesterol, and blood pressure		
Correct	287	50.8
wrong	46	8.1
No idea	232	41.1
If correct, how it works		
Physical activities	134	23.7
Good feeding habit	70	12.4
a and b	119	21.1
I do not know	242	42.8
Follow up on the advice given on lifestyle reduce the risk and prevent metabolic syndrome		
Correct	293	51.9
Not correct	48	8.5
No idea	224	39.6
If correct, when to do follow up		
All the time	275	48.7
Only when I am sick	32	5.7
When I feel like to follow up	40	7.1
I do not know	218	38.5
If correct, how it works		
Eating according to prescribe style everyday	265	46.9
Not eating again	16	2.8

Eat very little	76	13.5
	208	36.8

Perception/knowledge of the population on the prevention of metabolic syndrome

According to the results on Table V, only 49.4%, of the respondents understands that daily physical activity for a minimum of 30 minutes or 60 minutes if overweight, can prevent MS but others had no idea about it (50.6%). According to them, this would reduce body fat and waist circumference (45.5%). Most respondents understood that diseases in the system can be prevented by eating healthily (61.8%) by adapting diet rich in whole grains, fruits, vegetables, skinless poultry, fish, nuts, low-fat or fat-free dairy products (51.9%). In addition, majority of the respondents reported that regular check-up could help reduce the risk of MS especially for those with overweight (54%) like once in a month (29.2%). Only 58.6% of them knew that prevention of metabolic diseases by good lifestyle could help prevent diabetes (58.6%), since MS led to diabetes (54.3%). Overall, the population was very ignorant of MS and its prevention.

Table VI: Distribution of population perception on the prevention of metabolic syndrome

Variable	Frequency	Percentage
Daily physical activity for a minimum of 30 minutes or 60 minutes if overweight, can prevent metabolic syndrome		
Correct	279	49.4
Not correct	22	3.9
Not aware	264	46.7
If correct, how it works		
Reduce body fat and wait circumference	257	45.5
Makes you tired	24	4.3
Makes you relax	38	6.7
I do not know	246	43.5
Diseases in the system can be prevented by eating healthily		
Correct	349	61.8
wrong	26	4.6
Not aware	190	33.6
If correct, how it works		
Adopt a diet rich in whole grains, fruits, vegetables, skinless poultry, fish, nuts, low-fat products	293	51.9
Eating very much	30	5.3
Eating very little	42	7.4
Fasting every week	200	35.4
Regular check-up can help reduce the risk of metabolic syndrome especially for those with overweight		
Correct	305	54.0
Not correct	50	8.8
No idea	210	37.2
If correct, how often		
Once a week	112	19.8
Once a month	165	29.3
Once a year	90	15.9
check-up is not important	198	35.0
Prevention of Metabolic diseases by good lifestyle can help prevent diabetes mellitus		
Correct	331	58.6
Wrong	40	7.1

No idea	194	34.3
If correct, how it works		
Metabolic syndrome can lead to diabetes	307	54.3
Metabolic syndrome has nothing to do with diabetes	24	4.3
I do not know	234	41.4
Reducing intake of fatty food, could prevent Metabolic problem like heart diseases		
Correct	361	63.9
Wrong	38	6.7
No idea	166	29.4
If correct, how		
Fatty food produces high cholesterol which increased risk of MS	345	61.1
Fatty food does not affect metabolic syndrome	44	7.8
I do not know	176	31.1

The relationship between perception on the prevention of metabolic syndrome and demographic information

The results show that there were more females with greater percentage of perception on metabolic syndrome prevention than males. The differences were significant for two variables; regular check-up reduce the risk of metabolic syndrome ($P=0.001$) and prevention of metabolic diseases by good lifestyle to prevent diabetes ($P=0.001$). Age groups shows very little significance in the perception/knowledge on metabolic syndrome prevention, with poor perception as age group increases. Perception/knowledge was directly proportional to educational qualification. The differences between different educational levels were statistically significant for all variables ($P<0.05$)

Table VII: Distribution of perception of metabolic syndrome prevention and demographic information

Variable	Gender		P Value
	Male	Female	
Daily physical activity if overweight, can prevent MS	122 (43.7%)	155 (55.6%)	0.690
Diseases in the system can be prevented by eating healthily	148 (42.4%)	197 (56.4%)	0.335
Regular check-up reduce the risk of MS	118 (38.7%)	187 (61.3%)	0.001*
Prevention of Metabolic diseases by good lifestyle can prevent diabetes	152 (45.9%)	179 (54.1%)	0.001*
Reducing intake of fatty food, could prevent Metabolic problem like heart diseases	154 (42.7%)	205 (56.8%)	0.112

Variable	Age Group						P Value
	18-27	28-37	38-47	48-57	58-67	68-77	
Daily physical activity if overweight, can prevent MS	135 (48.4%)	89 (31.9%)	35 (12.5%)	12 (4.3%)	4 (1.4%)	4 (1.4%)	0.915
Diseases in the system can be prevented by eating healthily	150 (43%)	125 (35.8%)	47 (13.5%)	15 (4.3%)	6 (1.7%)	6 (1.7%)	0.376
Regular check-up reduce the risk of MS	141 (46.2%)	98 (32.1%)	45 (14.8%)	11 (3.6%)	4 (1.3%)	6 (2%)	0.111
Prevention of Metabolic diseases by good lifestyle can prevent diabetes	148 (44.7%)	113 (34.1%)	44 (13.3%)	16 (4.8%)	4 (1.2%)	6 (1.8%)	0.070
Reducing intake of fatty	161	131	48	15	4 (1.1%)	2 (0.6%)	0.012*

food could prevent Metabolic problem.	(44.6%)	(36.3%)	(13.3%)	(4.2%)			
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Variable	Qualification				P Value
	None	Primary	Secondary	University	
Daily physical activity if overweight, can prevent MS	14 (5%)	34 (12.2%)	116 (41.6%)	105 (37.6%)	0.001*
Diseases in the system can be prevented by eating healthily	16 (4.6%)	44 (12.6%)	140 (40.1%)	135 (38.7%)	<0.001*
Regular check-up reduce the risk of MS	12 (3.9%)	44 (14.4%)	124 (40.7%)	117 (38.4%)	0.050*
Prevention of Metabolic diseases by good lifestyle can prevent diabetes	10 (3%)	52 (15.7%)	128 (38.7%)	131 (39.6%)	<0.001*
Reducing intake of fatty food, could prevent Metabolic problem like heart diseases	14 (3.9%)	50 (13.9%)	148 (41%)	141 (39.1%)	0.002*

* Statistically significant

Discussion

To the best of our knowledge the present study is the first survey on metabolic syndrome to be conducted in the Northwest region. It therefore expands and complements earlier studies on this theme in other regions of the country [1-3] as well as provides new insights on the Knowledge and perception of MS on the increasingly urbanized population of the region.

According to the results, up to 45.5% of the respondents had no idea what metabolic syndrome is, and only 84 (14.9%) confirm that metabolic syndrome could be a group of sickness that can lead to heart disease, diabetes, and stroke. Just 48% of respondents confirm that Metabolic Syndrome affect someone by the presence of obesity, high blood pressure and high cholesterol in blood all combined. This was very clear that there is high level of ignorance and lack of awareness concerning MS.

Only 33.6% of the respondents identified ethnic groups and age as other factors associated with hypertension, obesity and conditions that are risk factors of MS. Furthermore, 38.8% of the respondents could think that the following groups of persons could be at high risk of suffering from metabolic syndrome; elderly persons above 65 years, those with high blood pressure, high blood sugar, and high LDL cholesterol in blood as well as those with Obesity. This was in agreement with the results of Part et al. [14], in study titled 'prevalence and associated risk factor findings in the US population from the Third National Health and Nutrition Examination Survey' where prevalence was highest in the elderly military population.

Majority of the respondents confirmed that too much weight led to metabolic diseases in the system like diabetes and other heart diseases. Many of the respondents confirmed that there is a close association between physical activity and sickness in our system and that physical activity reduces risk of diseases like diabetes. This supports another study by Després JP and Lemieux I [15], who stated that Metabolic syndrome is associated with abdominal obesity, blood lipid disorders, inflammation, insulin resistance or full-blown diabetes, and increased risk of developing cardiovascular disease. This was supported by other studies, which showed that increase weight was strongly associated with the development of hypertension, so the effect of weight loss on blood pressure control has been a focus of study [16].

The difference between age groups was not significant statistically, where the result showed a trend with decrease perception/knowledge as age increases ($P>0.05$). This means that the difference, though wide, may not be due to difference in perception, but due to difference in the distribution of the different age groups. There was a statistical significance in terms of age groups as those with the right perception were more of those with higher education. This

therefore means that perception/knowledge increases with increased education. The need to step up educational awareness to increase the knowledge of the population on metabolic syndrome (Table III).

According to the respondents, physical activity reduces the health risk associated with metabolic syndrome and that is because it controls diabetes, blood pressure and obesity, [17]. This could contribute to the management and prevention of metabolic syndrome.

They also identified losing weight to reduce risk of MS and risk of heart disease and that follow up on the advice given on lifestyle reduce the risk and prevent metabolic syndrome. This follow up must be done all the time or continuously and by eating everyday according to the prescribed style [18]. For gender, females were greater than the males in right perception/knowledge. For age groups, younger age groups had better perception/knowledge than those at higher age groups, while those with higher educational level had better perception than those with lower educational level ($P < 0.05$).

Though not enough, few respondents understood that daily physical activity for a minimum of 30 minutes or 60 minutes if overweight can prevent metabolic syndrome. According to them, this would reduce body fat and waist circumference. This was in line with another study, which stated that the first-line therapy to prevent and treat Metabolic Syndrome is lifestyle modification, such as the consumption of a healthy diet and the performance of physical activities [19]. Other literature also emphasises that the most important therapeutic intervention effective in subjects with Metabolic Syndrome should focus on modest weight reduction and regular leisure-time physical activities (20).

Most respondents also understood that diseases in the system can be prevented by eating healthily by adapting diet rich and low-fat products. This is also found in the ATP III recommendations for diet composition for patients with Metabolic Syndrome. In this recommendation, the guidelines for healthy anti-atherogenic diet call for: low intake of saturated fats, trans-fats, and cholesterol; reduced consumption of simple sugars; increased intakes of fruits, vegetables, and whole grains [21].

Conclusions

There is limited knowledge and awareness on the side of the population about metabolic syndrome and its risk factors. Majority of the respondents were not aware of the risk factors of metabolic syndrome, as well the management and prevention strategies.

There is need for increased awareness of the population on management and prevention of metabolic syndrome, the need for regular exercise, healthy diet, and to avoid diet that would increase body fat and obesity.

New methods are needed to improve adherence to a healthier and more active lifestyle such as exposing all strategies in local languages and their outlines put in health centres in communities.

Conflicts of Interests

The authors declare no conflict of interest.

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