

Survey on Knowledge of Cardiovascular Disease Risk Factors in the Dakar Region

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Abstract

Introduction: Non-communicable diseases constitute a major public health problem, due to their morbi-mortality. The aim was to study knowledge of cardiovascular risk factors among residents of Dakar. **Patients and Methods:** This was a descriptive cross-sectional study. Our investigations were recruited over a six-month period (October 17, 2021 to March 21, 2022). **Results:** Two hundred and twenty-six (226) patients were enrolled. The mean age was 45.9 years. The under-40 age group was the most represented with 37.2%. There were 129 men (57.1%), giving a male/female sex ratio of 1.33. The highest level was represented by 159 people (70.4%). Those who responded (heart disease) were in the majority (38.1%). Hypertension was the most common CVD for 101 people (44.7%). One hundred and ninety (190) people (84%) knew the risk factors for CVD. Good knowledge of risk factors concerned 103 people (54.2%). Obesity was the best-known risk factor in 156 cases (69%). The media was the most important source of information for 121 people (53.5%). Hypertensives were the most represented with 8.4%. One hundred and thirty (130) people (57.5%) had previously paid attention to these FDRCVs. Awareness campaigns were the most effective means of communication for 170 cases (75.2%). Sixteen (16) people (35.6%) were taking antihypertensive medication. Walking was the most popular physical activity for 102 people (45%). People with a balanced diet were in the majority, with 174 respondents (77.0%). **Conclusion:** NCDs are a major cause of morbidity and mortality. It is essential to develop and implement a prevention and management program.

Keywords

Hypertension, Diabetes, Risk Factors, Senegal

1. Introduction

Cardiovascular disease is a group of disorders affecting the heart and blood vessels [1]. According to the World Health Organization, 17.9 million people worldwide die each year from cardiovascular disease (CVD), accounting for around 32% of all deaths [1] [2]. Cardiovascular disease (CVD) is a NCD that also includes diabetes, cancer and chronic respiratory diseases. This alarming situation has become a real public health problem due to rising mortality rates in Africa and Senegal. Non-communicable diseases (NCDs) are long-term pathologies that generally progress slowly. In Senegal, health statistics show that the proportion of deaths due to these diseases is rising relatively fast. From 28% in 2000, this proportion rose to 47% in 2015. [3]. This figure is set to rise inexorably with progressive urbanization, changes in eating habits and the adoption of a new, increasingly Western lifestyle, all of which add up to cardiovascular risk factors [4]. Cardiovascular risk factors increase cardiovascular morbidity and mortality. It is necessary for a population to know its CVD risk factors, to be able to identify and prevent them in order to reduce morbi-mortality. We therefore decided to carry out this study with the main aim of assessing the level of knowledge and attitudes of the population of the Dakar region regarding risk factors and CVD.

2. Patients and Methods

The study took place in the Dakar region. It is home to almost a quarter of Senegal's population (3,732,282 inhabitants, or 23% in 2019).

2.1. Type of Study

This is a prospective cross-sectional descriptive study. Our surveys were recruited over a six-month period (October 17, 2021 to March 21, 2022).

2.2. Study Population

The study population consisted of people aged over 30 living in the Dakar region.

2.3. Inclusion Criteria

All people aged over 30 from the Dakar region and consenting to the study were included.

2.4. Non-Inclusion Criteria

Not included: All persons under 30 years of age who agreed to participate, all non-consenting persons.

2.5. Data Collection Procedure

A paper questionnaire was used as the database for this study. It covered marital status, knowledge of risk factors, attitude to cardiovascular disease risk factors

and practice. Of the 270 questionnaires drawn, 226 were retained, giving a response rate of 83.7%. The remaining questionnaires were not retained, as some were incomplete, and were completed by the respondents under the supervision of the interviewer. For those not attending school, the questionnaire was completed by the interviewer.

2.6. Study Variables

The data collected concerned:

- Socio-demographic data: age, gender, address, nationality, ethnicity, marital status, level of education, profession, employment status.
- Personal and family history.
- Anthropometric data: height, weight and waist circumference.
- Knowledge of risk factors:

The study began by looking at the significance of cardiovascular disease, known CVD, knowledge of risk factors for cardiovascular disease, and a better understanding of the risk factors for CVD.

Types of risk factors, the duration of knowledge of the risk factors and how they are communicated. Then we talked about known complications and risk factors, such as hypertension, diabetes and smoking.

- Attitudes towards cardiovascular disease risk factors:

In this part of the study, we'll be looking at the attention paid by the subject and those around him with regard to risk factors and the means that will be used to raise awareness among as many people as possible.

- Physical activity: In this last section, we collected data on the physical activity practised, the frequency of physical activity and the type of diet of the people surveyed.

- Risk factors for cardiovascular disease:

In this study, those considered as risk factors were: age (in men > 60 years in women), sex, sedentary lifestyle, stress, obesity, diabetes, alcoholism, oral contraception, poor dietary habits, dyslipidemia, arterial hypertension, high waist circumference, heredity, long-term corticosteroid therapy.

- Risk factor knowledge score:

Cardiovascular risk factors: We assigned the following scores to the people surveyed: Insufficient: for those who knew less than 3 risk factors; Average: for those who knew 4 or 6 risk factors; Good: for those who knew 7 to 13 risk factors; Excellent: for those who knew all risk factors.

- Anthropometric data:

The body mass index is a measure of the body's overall weight.

A person's corpulence. This index is calculated on the basis of height and weight.

Weight according to the formula: $BMI = \text{Weight (in kg)} / [\text{Height (in m)}^2]$. An individual is considered lean if the BMI is < 18 kg/m², normal if the BMI is between 18 and 25 kg/m², overweight if the BMI is between 25 and 30 kg/m² and

obese if the BMI ≥ 30 kg/m².

2.7. Data Capture and Analysis

Data were entered into Microsoft office Excel 2013 and a descriptive analysis was carried out using SPSS (statistical packages for social science) version 2018.

3. Results

3.1. Socio-Demographic Aspects

Two hundred and twenty-six (226) patients were enrolled during the study period. The mean age was 45.9 ± 11.74 years, with extremes of 30 and 85 years. The under-40 age group was the most represented, with 84 people (37.2%). The male gender was the most represented, with 129 people (57.1%). The male/female sex ratio was 1.33. The Wolof ethnic group was the most represented, with 60 people (26.6%). Married people were in the majority, with 172 cases (76.1%). Single people numbered 47 (20.8%). Workers in the private sector were the most represented at 74%. Those in active employment made up the majority with 183 cases (81.0%). Hypertensive volunteers accounted for 25 cases (11.06%) (**Table 1**).

3.2. Clinical Data

A family history of hypertension was noted in 81 volunteers (36%). A family history of diabetes was noted in 49 cases (21.6%). Mean BMI was $23.88 \text{ kg/m}^2 \pm 3.618 \text{ kg/m}^2$, with extremes ranging from 15 kg/m^2 to 38 kg/m^2 . Eleven (11) people (4.8%) were obese. Forty-eight (48) people (21.2%) were overweight.

3.2.1. Knowledge of Risk Factors

The meaning of “cardiovascular disease” people who responded with (heart disease) made up the majority (86 people) or 38.1%. Seventy-two (72) people (31.9%) responded by CVD (heart and vessel disease) (**Table 2**).

Table 1. Distribution of respondents according to personal history.

Personal history	Workforce	Percentage (%)
Stress	60	27
Hypertension	25	11.06
Smoking	18	7.9
Diabetes	14	6.1
Obesity	12	5.3
Dyslipidemia	7	3
Alcoholism	6	2.6
Taking contraception	10	4.4
Long-term corticosteroid therapy	3	1.3

Table 2. Distribution of respondents according to their ability to define cardiovascular disease.

Significance of cardiovascular disease	Workforce	Percentage (%)
MC	86	38.1
MCV	72	31.9
No answer	57	25.2
Blocked arteries	1	0.4
Blood clots	4	1.8
Paralysis	1	0.4
HTA	6	2.7
Hypotension	1	0.4
Vein diseases	2	0.9
AVC	4	1.8
Cardiac arrest	1	0.4
Muscles	1	0.4
Atherosclerosis	1	0.4

Knowledge of cardiovascular diseases: One hundred and eighty-one (181) people (80.1%) knew of at least one or more cardiovascular diseases.

Known cardiovascular diseases: Hypertension was the most well-known cardiovascular disease for 101 people (44.7%). Stroke (cardiovascular accident) was known to 85 people (37.6%). MI (myocardial infarction) was known in 37 people (16.4%) (**Table 3**).

Knowledge of CVD risk factors: One hundred and ninety (190) people, or 84%, knew about CVD risk factors. The media was the most important source of information for 121 people (53.5%). Social networks were the source of information for 71 people (31.4%). Awareness campaigns were sources of information for 66 people (29.2%). Obesity was the most well-known risk factor for 156 people (69.0%). Smoking was known by 151 people (66.8%). Alcoholism was known by 147 people (65.0%). Hypertension was known by 146 people (64.6%) (**Table 4**). Good knowledge of FRCVs was found in 103 people (54.2%). Fifty-two (52) people (27.3%) had average knowledge. Twenty-eight (28) people (14.7%) had insufficient knowledge. Thirty-nine (39) people (17.2%) suffered from CVD.

Known complications: Nephropathy was the best-known complication of diabetes for 23 people (10.2%). Limb amputation was known for 17 people (7.5%). Retinopathy was known to 15 people (6.6%). Cardiovascular accident (CVA) was the most common complication of hypertension for 49 people (21.7%). Myocardial infarction (MI) was known in 13 cases (5.7%).

3.2.2. Attitude to Risk Factors

One hundred and thirty (130) people (57.5%) had previously paid attention to

Table 3. Distribution of respondents according to known CVDs.

Known CVD	Workforce	Percentage (%)
No answer	59	26.1
AVC	85	37.6
IDM	37	16.4
HTA	101	44.7
Hypotension	10	4.4
Congenital heart defect	1	0.4
Thrombosis	6	2.7
TACHYCARDIA	4	1.8
Arrhythmia	12	5.3
Spasms	1	0.4
Atherosclerosis	7	3.1
Heart failure	28	12.4
Angina	11	4.9
Cardiac	5	2.2
Cardiac arrest	13	5.8
Heart disease	4	1.8
Obesity	2	0.9
Diabetes	12	5.3
Bronchitis, asthma, respiratory insufficiency	1	0.4
Heart disease	3	1.3
Stress	1	0.4
Cardiomyopathies	1	0.4
Arteriosclerosis	1	0.4
Heart cancer	1	0.4
I.R	3	1.3
Ailments	1	0.4

Table 4. Distribution of risk factors.

Risk factors	Workforce	Percentage (%)
Long-term corticosteroid therapy	12	5.3
Smoking	151	66.8
Stress	144	63.4
Obesity	156	69.0
Sedentary lifestyle	115	50.9

Continued

HTA	146	64.6
Diabetes	109	48.2
Alcoholism	147	65.0
Age	82	36.3
Gender	22	9.7
Heredity	69	30.5
High waist circumference	18	8.0
Poor eating habits	142	62.8
Taking birth control pills	35	15.5
Dyslipidemias	37	16.4
Poorly treated hypothyroidism	18	8.0

these risk factors. One hundred and seventy-four (174) people (77%) were aware of CVD risk factors.

Effective means of communication to raise awareness

Awareness campaigns would be the most effective means of communication for 170 people, or 75.2%. Social networks were effective for 167 people (73.9%). Two hundred and five (205) people (90.7%) thought that awareness-raising was effective.

3.2.3. Practice

Sixty-three (63) people, or 27.8%, were undergoing treatment. Nineteen (19) people (30.1%) were taking antihypertensives. Thirteen (13) people (20.6%) were taking anti-diabetics. Ten (10) people (15.8%) were taking oral contraceptives. One hundred and sixty-seven (167) people (73.9%) were physically active. Walking was the most common physical activity for 70 people (31%). Those who took part in daily physical activity were the most represented (70 people), *i.e.* 31%. Thirty-seven (37) people (16.3%) were physically active once a week. Forty-four (44) people (19.4%) were physically active 2 to 3 times a week.

A majority of 174 people (77%) had a balanced diet. Sixteen people (16) or 7% had a salty diet. Twelve (12) people (5.3%) had a sweet diet. Eight (8) people (3.5%) had a fatty diet (**Table 5**).

4. Discussion

Our study has certain limitations, as few solutions were proposed to prevent cardiovascular risk factors, and some respondents were not very cooperative. In our study, the rate of good knowledge of cardiovascular risk factors was very high (54.2%), followed by those with an average level of knowledge of risk factors (27.3%) and those who had no idea about risk factors (16%). In the Kamdem study in Cameroon, the rate of good knowledge in the population (4 or more risk factors) was 73.3%; 6% knew no risk factors at all, while 2.7% knew all risk factors [5].

Table 5. Distribution of respondents according to their diet.

Power supply	Workforce	Percentage (%)
Balanced	174	77
Salty	16	7
Sweet	12	5.3
Grasse	8	3.5
Fatty, sweet, salty	7	3.1
Savoury, sweet	7	3.1
Salty, oily	1	0.4
Sweet, oily	1	0.4
Total	226	100

In another study, 71.1% had good knowledge of cardiovascular disease, and 28.9% had moderate or poor knowledge of cardiovascular disease [6]. The good level of knowledge of cardiovascular risk factors observed in our study can be explained by the high level of education in our population (70% higher education). Comparable results were obtained elsewhere, where higher and secondary education levels were 47.84% and 31.48% respectively [7]. Overall, the predominance of higher education in our study is due to the urban setting of the study. On the other hand, in a study by F Kamdem *et al*, secondary (36.6%) and higher education (56.5%) were more prevalent [5].

In our study, when asked what cardiovascular disease means, those who answered heart disease made up the majority (38.1%).

Some 32% responded with CVD (heart and vascular disease). Only 2% responded by HTA (hypertension). In P Zabsonré's study Hypertension was ranked after alcohol, smoking and obesity as the fourth risk factor [8]. 80.1% of our subjects had at least one or more cardiovascular diseases. The most frequently identified type of CVD was coronary artery disease (29.0%), followed by congenital heart disease (27.8%), deep vein thrombosis and pulmonary embolism (24.5%) [9]. In our study, 84% were aware of CVD risk factors. Nearly 60% were unaware of any type of cardiovascular disease (403). In terms of risk factors, the best known were obesity (69.0%), followed by smoking (66.8%), alcoholism (65.0%), and high blood pressure (64.6%). In A Sanuade's study, the majority of respondents (92.8%) knew that smoking increased the risk of cardiovascular disease [6]. 46.0%, on the other hand, said that cardiovascular disease could not be affected by heavy alcohol consumption [6]. Smoking was identified as the most common risk factor in this study. This is consistent with that reported in Pakistan [10], but higher than that indicated in previous studies in the Gulf States and Nepal [11] [12].

Stress was mentioned in 27% of cases. A third (33.3%) of participants reported a very stressful or stressful lifestyle [9]. This result is close to that reported in

Iran, Jordan and South Africa [13] [14] [15]. Stress is increasingly regarded as an important and potentially modifiable risk factor for cardiovascular disease. The best-known complications of hypertension were cardiovascular accident (CVA) at 21.7%, followed by myocardial infarction (MI) at 5.7% and chronic renal failure (CRF) at 3.5%. These complications call for proper management of hypertensive patients to reduce morbidity and mortality. A family history of hypertension was noted in 36% of cases. Mbaye *et al*, the prevalence of a family history of hypertension was similar to ours: 37.6% [4]. A family history of diabetes was observed in 21.6% of respondents. This result is similar to that obtained in a study by Mbaye *et al* in Senegal (21.4%) [4]. Diabetes is also a known risk factor in the population. In contrast, only 287 subjects (19.7%) were aware that diabetes was a cardiovascular risk factor [16]. A family history of diabetes was found in 16.1% (n = 247) of those surveyed. In our survey, 96.3% of the population had heard the word “diabetes” [16]. However, 80.3% of these subjects did not consider diabetes to be a risk factor [16]. In a study in the Congo, 35.3% claimed to have comprehensive knowledge of diabetes [17]. In our study, those who took part in daily physical activity accounted for 31%. In KOWEIT 13.0% reported exercising for 30 minutes, 5 or more times a week [9]. Those with a balanced diet were in the majority, with 174 people (77%). Sixteen people (16) or 7% had a salty diet. Twelve (12) people (5.3%) had a sweet diet. Eight (8) people (3.5%) had a fatty diet. Elsewhere, 27.2% declared that they ate healthy foods every day. Limiting dietary salt intake is therefore in the public health interest. The impact of fats on cardiovascular disease depends more on their composition [18] [19]. The main deleterious effect of saturated fats on the cardiovascular system is to increase LDL cholesterol. This effect is linked to a decrease in the activity of LDL cholesterol receptors, which reduce the cellular uptake of cholesterol [20], rather than to their quantity [18]. The media play an important role in raising awareness of CD. The media was the main source of information, with 53.5%, while awareness campaigns came last, with 29.2%. The use of the media (radio/television) was a source of better knowledge about these risk factors in 82.6% of cases [20].

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- [1] Farley, A., McLafferty, E. and Hendry, C. (2012) The Cardiovascular System. *Nurses' Stand*, **27**, 35-39.
- [2] Roth, G.A., Johnson, C., Ababibir, A., Abd-Allah, F., Abera, S.F., *et al.* (2017) Global, Regional and National Burden of Cardiovascular Disease for 10 Causes, 1990 to 2015. *Journal of the American College of Cardiology*, **70**, 1-25. <https://doi.org/10.1016/j.jacc.2017.04.052>
- [3] Mane, P.Y., Diagne, A. and Kpegli, Y.T. (2019) Modeling the Macroeconomic Ef-

- fects of Disease: Extension and Application in the context of Senegal. *International Journal of Economics and Financial*, **9**, 116-120.
- [4] Mbaye, M.-N., Niang, K., Sarr, A., Mbaye, A., Diedhiou, D., et al. (2011) Kane Epidemiological Aspects of Diabetes in Senegal: Results of a Survey of Cardiovascular risk Factors in the City of Saint-Louis.
- [5] Kamdem, F., Djomou, F.A., Hamadou, B., Ngonsala, S., et al. (2018) Connaissance des Facteurs de Risque Cardiovasculaires et Attitudes de Prévention par la Population du District de Santé de Deido-Cameroun. *Health Sciences and Disease*, **19**, 36-41.
- [6] Sanuade, A., Kushitor, M.K., Awuah, R.B., Asante, P.Y., et al. (2021) Lay knowledge of cardiovascular disease and risk factors in three communities in Accra, Ghana: A Cross-Sectional Survey. *BMJ Open*, **11**, 1-9. <https://doi.org/10.1136/bmjopen-2021-049451>
- [7] El Ghazi, I., Berni, I., Menouni, A., Kestemont, M.P., Amane, M. and El Jaafari, S. (2021) Epidemiological Profile of Cardiovascular Diseases in the City of Meknes (Morocco). *European Scientific Journal*, **14**, 41-55.
- [8] Zabsonré, P., Sanou, G., Avanzini, F. and Tognoni, G. (2002) Knowledge and Perception of Cardiovascular Risk Factors in Sub-Saharan Africa. *Archives des Maladies du Coeur et des Vaisseaux*, **95**, 23-28.
- [9] Awad, A. and Al-Nafisi, Hala. (2014) Public Knowledge of Cardiovascular Disease and Its Risk Factors in Kuwait: A Cross-Sectional Survey. *BMC Public Health*, **14**, Article 1131. <https://doi.org/10.1186/1471-2458-14-1131>
- [10] Khan, M.S., Jafary, F.H., Jafar, T.H., Faruqui, A.M., Rasool, S.I., et al. (2006) Knowledge of Modifiable Risk Factors for Heart Disease in Patients Presenting with Acute Myocardial Infarction in Karachi, Pakistan: A Cross-Sectional Study. *Cardiovascular Disorder BMC*, **6**, Article No. 18. <https://doi.org/10.1186/1471-2261-6-18>
- [11] Kamran, S., Bener, A.B., Deleu, D., Khoja, W., Jumma, M., Al Shubali, A., Inshashi, J., et al. (2007) The Level of Awareness of Stroke Risk Factors and Symptoms in Gulf Cooperation Council Countries: Gulf Cooperation Council Stroke Awareness Study. *Neuroepidemiology*, **29**, 235-242. <https://doi.org/10.1159/000112856>
- [12] Arau, V. and Krettek, A. (2013) Cardiovascular Health Knowledge, Attitudes and Practices/Behaviours in an Urbanized Community in Nepal: A Population-Based Cross-Sectional Study of the Jhaukhel-Duwakot Demographic Health Surveillance Site. *BMJ Open*, **3**, 1-11. <https://doi.org/10.1136/bmjopen-2013-002976>
- [13] Mazloomi, S.S., Baghianimoghadam, M.H., Ehrampoush, M.H., Baghianimoghadam, B., Mazidi, M. and Mozayan, M.R. (2014) A Study of the Knowledge, Attitudes and Practices (KAP) of Women Referred to Health Centers for Cardiovascular Disease (CVD) and Their Risk Factors. *Health Care for Women International*, **35**, 50-59. <https://doi.org/10.1080/07399332.2012.755980>
- [14] Mukattash, T.L., Shara, M., Jarab, A.S., Al-Azzam, S.I., Almaaytah, A. and Al Hamarneh, Y.N. (2012) Public Knowledge and Awareness of Cardiovascular Disease and Its Risk Factors: A Cross-Sectional Study of 1000 Jordanians. *International Journal of Pharmacy Practice*, **20**, 367-376. <https://doi.org/10.1111/j.2042-7174.2012.00208.x>
- [15] Li, Y.Q. and Wright, S.C. (2007) Risk Factors for Cardiovascular Disease in the Ga-Rankuwa Community. *Curations*, **30**, 79-87. <https://doi.org/10.4102/curationis.v30i4.1120>
- [16] Millogo, G.R.C., Yaméogo, C., Samandoulougou, A., Yaméogo, N.V., Kologo, K.J., et al. (2015) Diabetes in Urban Ouagadougou, Burkina Faso: Epidemiological Pro-

- file and Level of Perception of the Adult Population. The Pan African Medical Journal, **20**, Article 146. <https://doi.org/10.11604/pamj.2015.20.146.3249>
- [17] Katchunga, P.B., Malanda, B., Mweze, M.C., Dupont, B., M'Buyamba-Kabangu, J.R., Kashongwe, Z., Kabinda, J.M. and Buyschaert, M. (2012) Connaissances de la population générale sur l'hypertension artérielle et le diabète sucre' au Sud-Kivu, République démocratique du Congo. *Revue d'Épidémiologie et de Santé Publique*, **60**, 41-147. <https://doi.org/10.1016/j.respe.2011.10.005>
- [18] Cordain, L., Eaton, S.B., Sebastian, A., Mann, N., Lindeberg, S., Watkins, B.A., et al (2005) Origins and Evolution of the Western Diet: Health Implications for the 21st Century. *The American Journal of Clinical Nutrition*, **81**, 341-354. <https://doi.org/10.1093/ajcn.81.2.341>
- [19] Nelson, G.J., Schmidt, P.C., Kelley, D.S. (1995) Low-Fat Diets Do Not Lower Plasma Cholesterol Levels in Healthy Men Compared to High-Fat Diets with Similar Fatty Acid Composition at Constant Caloric Intake. *Lipids*, **30**, 969-976. <https://doi.org/10.1007/BF02536280>
- [20] Knopp, R.H. (2000) Introduction: Low-Saturated Fat, High-Carbohydrate Diets: Effects on Triglyceride and LDL Synthesis, the LDL Receptor, and Cardiovascular Disease Risk. *Proceedings of the Society for Experimental Biology and Medicine*, **225**, 175-177. <https://doi.org/10.1111/j.1525-1373.2000.22520.x>