

Factors Associated with Overweight among Workers of the Ministry of Labor and Public Service in Benin in 2023

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Abstract

Introduction: The problem of excess weight is pandemic and affects the majority of nations, regardless of their level of development. However, the prevalence of overweight among workers in Benin is very poorly documented. To fill this gap, the present study aimed to determine the prevalence and factors associated with overweight among workers of the Ministry of Labor and Public Service (MTFP) in 2023 in Benin. **Materials and Methods:** This is a descriptive cross-sectional study with analytical purposes carried out from August 16 to December 17, 2023, among MINISTRY OF LABOR AND PUBLIC SERVICE staff. The variables studied were overweight, sociodemographic, occupational and dietary characteristics, lifestyle, anthropometric factors and family history of obesity. An exhaustive recruitment of workers meeting our inclusion criteria and a questionnaire survey was carried out. Data were analyzed using R 4.0.4 software. A bivariate analysis followed by a multivariable analysis made it possible to identify the factors associated with overweight at the $p < 0.05$ threshold. **Results:** In total, 379 workers were included in our study. The average age of the surveyed workers was 44.86 years \pm 7.67 years, with 202 (53.30%) workers at least 45 years old. Men predominated with a number of 228 (60.16%). The prevalence of overweight was 63.32% (95% CI: [58.23 - 68.15]) and the associated factors after multivariate analysis were: female sex (ORa = 4.00; 95% CI [2.11 - 7.76]; $p < 0.001$), traveling to the service by car (ORa = 10.40; 95% CI [1.56 - 75.50]; $p = 0.019$), generally obese family members (ORa = 3.49; 95% CI [1.70 - 7.46]; $p < 0.001$), frequent con-

sumption of poultry (ORa = 2.01; 95% CI [1.09 - 3.76]; p = 0.025), frequent consumption of dough (ORa = 3.94; 95% CI [1.72 - 9.57]; p = 0.001), snacking (ORa = 2.83; 95% CI [1.33 - 6.30]; p < 0.007), high blood pressure (ORa = 7.65; 95% CI [3.46 - 18.50]; p < 0.001) and diabetes (ORa = 24.50; 95% CI [9.74 - 76.60]; p < 0.001). **Conclusion:** The prevalence of overweight is high among ministry of labor and public service workers. Education and awareness in the professional environment on the prevention and management of risk factors are essential for a long-term impact on a notable regression of this public health phenomenon.

Keywords

Overweight, Associated Factors, Workers-Benin

1. Introduction

Overweight is the result of weight gain and includes overweight and obesity. These are global problems that are increasing at an alarming and uncontrollable rate. According to recent global estimates from the World Health Organization (WHO) in 2020, the number of obesity cases has almost tripled since 1975. 39% of adults aged 18 and over were overweight in 2016 and 13% were obese. The global burden of excess weight is estimated at 2.8 billion deaths per year [1]. Obesity, therefore, constitutes a real public health problem [2]. Associated with increased risks of morbidities such as non-insulin-dependent diabetes or “type 2 diabetes”, high blood pressure, cardiovascular diseases, musculoskeletal disorders as well as several types of cancers, obesity would reduce life expectancy by two to three years and extreme obesity would reduce it by more than eight years [3]. The prevalence of overweight is estimated at 20% - 50% by 2025 in Africa [4]. Studies show that in adult populations, 20.8% of Nigerians are overweight, 31.3% of South Africans are obese, and 37.1% and 27.8% of Ghanaians are overweight and obese respectively [5] [6].

In Benin, the results of the fight against obesity remain below expectations. Indeed, certain studies carried out in Ouidah, Cotonou and rural areas have noted obesity prevalence far higher than the national average: 28.2% in rural areas and 52.5% in metropolitan areas; women are the most affected, with a prevalence four times larger than that of men. These high prevalences of MS may be linked to food processing, in which the consumption of natural foods has decreased and the consumption of processed foods has increased very significantly, leading to an unbalanced food intake in terms of nutrients [7]. In addition, the reduction in meals made at home, the increase in consumption of fast food and the brevity of meal periods [8], socioeconomic status, low level of physical activity, consumption of beverages sweet or energetic meals and environmental factors [9] are also contributing factors.

To our knowledge, few studies have been carried out in the workplace on this

topic. Given the lack of data on overweight among workers and in order to contribute to better prevention of this emerging risk, we carried out a study to determine the prevalence of overweight and its associated factors among workers of the Ministry of Labor and Civil Service in 2023.

2. Materials and Methods

2.1. Framework of the Study

The study was carried out on the various sites housing Ministry of Labor and Public Service (MTFP) workers and spread across all departments. Constituting one of the twenty-four ministries of the Government of the Republic of Benin, this ministry is composed of:

- Structures directly attached to the minister;
- People and services directly attached to the minister;
- Minister's office;
- General Secretariat of the Ministry;
- Central management;
- Technical directions;
- Organization under supervision.

2.2. Study Methods

1) Type and period of study

This was a descriptive cross-sectional study with analytical purposes. The investigation took place over a period of four (04) months, from August 16 to December 17, 2023.

2) Study population

The study population consisted of the Ministry of Labor and Public Service civil servants.

3) Inclusion criteria

Be an employee of the Ministry of Labor and Civil Service in 2023 and have given informed consent to participate in the study.

4) Non-inclusion criteria

Be admitted to retirement or be a worker on mission or be a worker on leave.

5) Sampling

Sample size

The sample size was calculated with the following Schwartz formula:

$$n = (Z_{\alpha}^2 pq) / i^2$$

$p = 77.7\%$ (Prevalence of overweight among bankers in the city of Arusha, Tanzania) [10],

$n =$ sample size,

$Z_{\alpha} = 1.96$, which is the reduced deviation for a risk of error $\alpha = 5\%$,

$q = 100 - p$ and $p = 77.7\%$,

$i = 0.05$ (desired precision),

$n = 266$ workers,

A margin of 10% was applied to this size; hence, N = 292 workers.

Sampling technique

The sampling used is non-probabilistic, with exhaustive selection of all subjects meeting the inclusion criteria.

6) Variables

Overweight: is considered overweight any worker with a Body Mass Index (BMI) greater than or equal to 25 kg/m² (BMI ≥ 25 kg/m²).

Overweight includes overweight (25 kg/m², BMI ≥ 30 kg/m²) and obese (BMI > 30 kg/m²).

Overweight was dichotomized into yes and no for the purposes of analysis.

The independent variables were related to:

Socio-demographic characteristics (age, gender, marital status, number of children);

Occupational characteristics (workstation, sedentary work, means of travel to work). Workstations were subdivided into three (03) categories:

Execution position;

Design level A: design, management and senior management positions;

Design level B: middle management, application and drafting positions.

Lifestyle characteristics (smoking, alcohol consumption, physical activity, sleep duration). Physical activity was classified into three (03) categories: intense physical activity (at least 30 min of activity per day), moderate physical activity (physical activity two to three times per week), low physical activity (one or no physical activity per week).

Sleep duration was divided into two phases: less than eight (08) hours and greater than or equal to eight (08) hours (Simon R. *et al.*, 2005).

Characteristics related to workers' diet (daily eating practices, meal frequency, type of meal). For these last two types of characteristics, two criteria were used: frequently, which corresponds to several times a week, and rarely, which represents at most once a week.

Anthropometric characteristics (weight, height, BMI);

Family history of overweight (overweight ascendants, overweight collaterals. Ascendants refer to siblings, while collaterals refer to brothers and sisters, cousins and aunts and uncles. The term "generally" refers to more than half the people concerned.

2.3. Data Collection Techniques and Tools

1) Data collection tools

The data was collected using a structured questionnaire administered to the respondents.

A pre-test of the questionnaire was carried out to ensure clarity and make adjustments if necessary in order to have a definitive interview guide. The author had to test the validity and reliability of the questionnaire with a sample of around ten workers.

Anthropometric data was collected using physical measuring instruments

such as mechanical scales for adults [model 761, SECA] and mobile measuring rods graduated, respectively for weight and height measurements.

The other data was collected by declaration from the worker.

The questionnaire contained 76 items divided into six (06) sections. The data collected concerned sociodemographic, professional, anthropometric, behavioral, sociocultural characteristics and medical history.

2) Data collection techniques

Prerequisites for data collection.

The collection phase was preceded by training of interviewers on questionnaire administration techniques so that they are able to properly explain the different questions to the workers selected as part of our study to collect the right information.

Contact was made with the authorities at various levels to explain the objectives of the study to them. A work schedule has been drawn up for the project.

3) Performing data collection

The investigators collected the information at the different sites in the study setting.

At the end of each working day, the completeness and consistency of the data were checked.

2.4. Statistical Analysis

The data were analyzed with R 4.0.4 software. Proportions and their confidence intervals were calculated for qualitative variables. Quantitative variables were expressed as mean and standard deviation. The normality of the distribution was checked with the Shapiro test.

A bivariate analysis followed by a multivariate analysis by binary logistic regression was carried out to search for associated factors. The choice of variables to enter into the initial model was made on the basis of the literature review and statistical tests. The initial model included the variables at the 20% conservation threshold after the bivariate analyses, as well as the interaction terms with the main explanatory variable. The adjusted odds ratio (aOR) and its 95% confidence interval [95% CI] were used as a measure of association. The significance level was less than 0.05.

2.5. Considerations Ethical

Authorization was requested and obtained from the Minister of Labor and Civil Service before the start of the study. Individual informed consent was obtained from each participant. The data was collected and processed with respect for confidentiality and human rights.

3. Results

3.1. Sociodemographic and Professional Characteristics

A total of 379 workers participated in the study. The sociodemographic charac-

teristics of the workers surveyed were as follows: an average age of 44.86 years \pm 7.67 years, with 202 (53.30%) workers at least 45 years old; a male predominance with 228 (60.16%) men; a married life among 231 (60.95%) workers; a number of children of at least three among 243 (64.12%) workers.

As for the professional characteristics, they were as follows: 260 (68.60%) of the 379 workers surveyed were in level B design positions (middle management, application and writing positions), while 188 (49.60%) of them traveled by car to get to the service.

3.2. Behavioral Characteristics

Table 1 presents the distribution of workers interviewed according to their lifestyle.

Of the 379 workers surveyed, 9 (2.37%) consumed tobacco; 248 (65.44%) took alcoholic beverages; 215 (56.72%) had low physical activity practice, and 329 (86.81%) had a sleep duration of at least 10 hours.

Table 1. Distribution of workers surveyed in Benin in 2023 at the Ministry of Labor and Public Service according to lifestyle (n = 379).

	n	%
Taking alcoholic beverages (beer, sodabi, wine)		
No	131	34.56
Yes	248	65.44
Tobacco consumption		
No	370	97.63
Yes	9	2.37
Physical activity		
Weak	215	56.72
Moderate	139	36.68
Intense	25	6.60
Sleep duration		
<8	50	13.19
\geq 8	329	86.81

3.3. Family History of Obesity

Table 2 presents the distribution of workers interviewed according to their family history of obesity.

The family history of obesity among workers was as follows: 141 (37.20%) workers had obese parents, and 98 (25.86%) had obese family members.

Table 2. Distribution of workers surveyed in 2023 at the Ministry of Labor and Public service according to family history of obesity (n = 379).

	n	%
Obese parents		
No	238	62.80
Yes	141	37.20
Members of your family who are generally obese		
No	281	74.14
Yes	98	25.86

3.4. Power-Related Features

Table 3 presents the distribution of workers interviewed according to their diet.

Among the workers surveyed, 157 (41.42%) frequently consumed poultry, 136 (35.88%) frequently ingested dairy products (milk, yogurt, cheese), and 106 (27.97%) frequently took sweet foods.

Table 3. Distribution of workers surveyed in 2022 at the Ministry of Labor and Public Service according to diet (n = 379).

	n	%
Vegetable consumption		
Frequently	248	65.44
Rarely	131	34.56
Fruit consumption		
Frequently	341	89.97
Rarely	38	10.03
Consumption of sweet foods		
Rarely	273	72.03
Frequently	106	27.97
Consumption of sugary drinks		
Frequently	321	84.70
Rarely	58	15.30
Poultry consumption		
Frequently	157	41.42
Rarely	222	58.58
Consumption of red meat		
Frequently	126	33.25
Rarely	253	66.75
Consumption of corn dough		

Continued

Rarely	321	84.70
Frequently	58	15.30
Consumption of dairy products		
Frequently	136	35.88
Rarely	243	64.12
Snacking		
No	68	17.94
Yes	311	82.06

3.5. Medical Background

The medical history of the workers surveyed was distributed as follows: high blood pressure (29.29%), diabetes (34.56%), spinal pain (6.60%), and respiratory failure (2.11%).

Figure 1 below shows the distribution of medical histories among the workers surveyed.

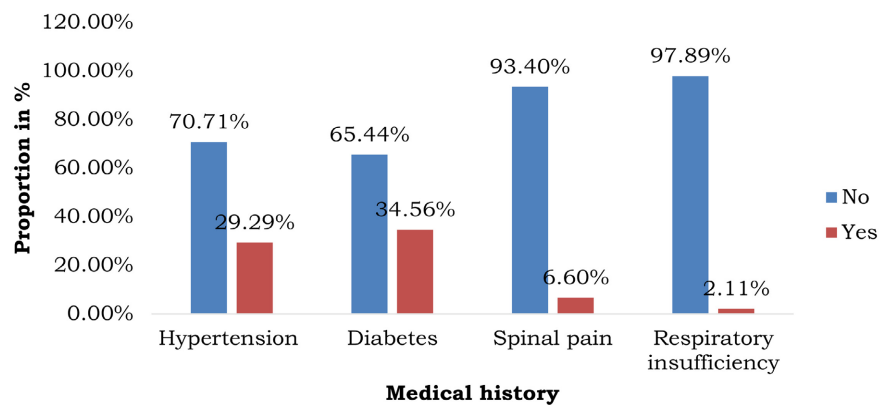


Figure 1. Distribution of workers surveyed at the Ministry of Labor and Public Service in 2023 according to their medical history (n = 379).

3.6. Prevalence of Overweight

Table 4 presents the distribution of workers interviewed according to overweight.

Among the 379 workers surveyed, 240, or 63.32%, 95% CI: [58.23 - 68.15] were overweight.

Table 4. Distribution of workers surveyed in Benin in 2023 at the Ministry of Labor and Public Service according to overweight (n = 379).

BMI	n	%
Thinness	6	1.59
Normal	133	35.09
Overweight	240	63.32

3.7. Factors Associated with Being Overweight among Workers Surveyed in Benin in 2023 at the Ministry of Labor and Public Service in Bivariate Analysis

3.7.1. Overweight and Sociodemographic and Professional Characteristics

Table 5 presents the relationships between the sociodemographic and professional characteristics of the workers surveyed and overweight.

According to this table, there is a statistically significant association between overweight and sex ($p < 0.001$). Likewise, the use of a means of transportation was significantly associated with being overweight ($p = 0.034$). Age, number of children and marital status were not significantly associated with overweight ($p > 0.05$).

Table 5. Overweight and sociodemographic characteristics and professional workers surveyed in Benin in 2023 at the Ministry of Labor and Public Service ($n = 379$).

	Overweight		Total	p-value
	Yes n (%)	No n (%)		
Age				0.789
[25, 35)	22 (9.17)	13 (9.35)	35	
[35, 45)	93 (38.75)	49 (35.25)	142	
[45, 100]	125 (52.08)	77 (55.40)	202	
Sex				<0.001
Male	114 (47.50)	114 (82.01)	228	
Feminine	126 (52.50)	25 (17.99)	151	
Number of children				0.078
<3	94 (39.17)	42 (30.22)	136	
≥3	146 (60.83)	97 (69.78)	243	
Marital status				0.362
Bachelor	94 (39.17)	53 (38.13)	147	
Married	146 (60.83)	85 (61.15)	231	
Widowed/Divorced	0 (0.00)	1 (0.72)	1	
Workplace				0.465
Execution station	49 (20.42)	35 (25.18)	84	
Level A design position	21 (8.75)	14 (10.07)	35	
Level B design position	170 (70.83)	90 (64.75)	260	
Moving means				0.034
Walk	6 (2.50)	8 (5.76)	14	
Motorbike	104 (43.33)	73 (52.52)	177	
Car	130 (54.17)	58 (41.73)	188	

3.7.2. Overweight and Medical Background

Table 6 presents the association between the medical history of the workers surveyed and overweight.

According to this table, there is a statistically significant association between being overweight and high blood pressure as well as with diabetes ($p < 0.001$).

Table 6. Association between the medical histories of the workers surveyed at Benin in 2023 at the Ministry of Labor and Public Service and overweight (n = 379).

	Overweight		Total	p-value
	Yes n (%)	No n (%)		
High blood pressure				<0.001
No	139 (57.92)	129 (92.81)	268	
Yes	101 (42.08)	10 (7.19)	111	
Diabetes				<0.001
No	114 (47.50)	134 (96.40)	248	
Yes	126 (52.50)	5 (3.60)	131	
Spinal pain				0.723
No	225 (93.75)	129 (92.81)	354	
Yes	15 (6.25)	10 (7.19)	25	
Respiratory failure				0.476
No	234 (97.50)	137 (98.56)	371	
Yes	6 (2.50)	2 (1.44)	8	

3.7.3. Overweight and Family History of Obesity

Table 7 shows the family history of obesity associated with overweight in the workers surveyed.

The association is statistically significant between overweight and family history of obesity in the workers surveyed ($p < 0.001$).

Table 7. Association between family history of obesity of workers surveyed in Benin in 2023 at the Ministry of Labor and Public Service and overweight (n = 379).

	Overweight		Total	p-value
	Yes n (%)	No n (%)		
Obese parents				<0.001
No	131 (54.58)	107 (76.98)	238	
Yes	109 (45.42)	32 (23.02)	141	
Family members generally obese				<0.001
No	159 (66.25)	122 (87.77)	281	
Yes	81 (33.75)	17 (12.23)	98	

3.7.4. Overweight and Lifestyle

Table 8 presents the behavioral factors related to the lifestyle of the workers surveyed associated with being overweight.

According to this table, there is a statistically significant association between overweight and physical activity ($p < 0.001$) and sleep duration ($p < 0.001$).

Table 8. Association between healthy lifestyle workers surveyed in Benin in 2023 at the Ministry of Labor and Public Service and overweight (n = 379).

	Overweight		Total	p-value
	Yes n (%)	No n (%)		
Drinking alcoholic beverages				0.831
No	82 (34.17)	49 (35.25)	131	
Yes	158 (65.83)	90 (64.75)	248	
Tobacco consumption				0.832
No	234 (97.50)	136 (97.84)	370	
Yes	6 (2.50)	3 (2.16)	9	
Coffee consumption				0.142
No	163 (67.92)	84 (60.43)	247	
Yes	77 (32.08)	55 (39.57)	132	
Physical activity				<0.001
Intense	11 (4.58)	14 (10.07)	25	
Moderate	74 (30.83)	65 (46.76)	139	
Weak	155 (64.58)	60 (43.17)	215	
Sleep duration				<0.001
<8 hrs	21 (8.75)	29 (20.86)	50	
≥8 hrs	219 (91.25)	110 (79.14)	329	

3.7.5. Overweight and Dietary Practices of Workers Surveyed at the Ministry of Labor and Public Service in Benin in 2023

Table 9 presents the eating habits of the workers surveyed associated with being overweight.

According to this table, it appears that there is a statistically significant association between overweight and the consumption of sugary foods ($p = 0.033$). Likewise, consumption of corn dough ($p = 0.004$) and snacking ($p < 0.001$) were significantly associated with being overweight ($p < 0.001$). Consumption of vegetables, fruit, sugary drinks, poultry, red meat, and dairy products was not significantly associated with being overweight ($p > 0.05$).

Table 9. Association between workers' eating habits surveyed in Benin in 2023 at the Ministry of Labor and Public Service and overweight (n = 379).

	Overweight		Total	p-value
	Yes n (%)	No n (%)		
Vegetable consumption				0.662
Frequently	159 (66.25)	89 (64.03)	248	
Rarely	81 (33.75)	50 (35.97)	131	
Fruit consumption				0.077
Frequently	221 (92.08)	120 (86.33)	341	
Rarely	19 (7.92)	19 (13.67)	38	
Consumption of sweet foods				0.033
Rarely	164 (68.33)	109 (78.42)	273	
Frequently	76 (31.67)	30 (21.58)	106	
Consumption of sugary drinks				0.706
Frequently	202 (84.17)	119 (85.61)	321	
Rarely	38 (15.83)	20 (14.39)	58	
Poultry consumption				0.062
Frequently	108 (45.00)	49 (35.25)	157	
Rarely	132 (55.00)	90 (64.75)	222	
Consumption of red meat				0.236
Frequently	85 (35.42)	41 (29.50)	126	
Rarely	155 (64.58)	98 (70.50)	253	
Consumption of corn dough				0.004
Rarely	194 (80.83)	127 (91.37)	321	
Frequently	46 (19.17)	12 (8.63)	58	
Consumption of dairy products				0.277
Frequently	91 (37.92)	45 (32.37)	136	
Rarely	149 (62.08)	94 (67.63)	243	
Snacking				<0.001
No	28 (11.67)	40 (28.78)	68	
Yes	212 (88.33)	99 (71.22)	311	

3.8. Factors Associated with Being Overweight among Workers Surveyed in Benin in 2023 at the Ministry of Labor and Public Service in Multivariate Analysis

At the end of the multivariable analysis, female gender (ORa = 4.00; 95% CI

[2.11 - 7.76]; $p < 0.001$), travel for the service by car (ORa = 10.40; 95% CI [1.56 - 75.50]; $p = 0.019$), generally obese family members (ORa = 3.49; 95% CI [1.70 - 7.46]; $p < 0.001$), frequent consumption of poultry (ORa = 2.01; 95% CI [1.09 - 3.76]; $p = 0.025$), frequent consumption of corn paste (ORa = 3.94; 95% CI [1.72 - 9.57]; $p = 0.001$), snacking (ORa = 2.83; 95% CI [1.33 - 6.30]; $p < 0.007$), high blood pressure (ORa = 7.65; 95% CI [3.46 - 18.50]; $p < 0.001$) and diabetes (ORa = 24.50; 95% CI [9.74 - 76.60]; $p < 0.001$) were associated with being overweight among ministry of labor and public service workers.

Table 10 presents the results of the multivariable analysis.

Table 10. Potential predictive factors associated with overweight among workers surveyed at the Ministry of Labor and Public Service in Benin in 2023 (n = 379).

	ORa	[95% CI]	p
Sex			<0.001
Male	1	-	
Feminine	4.00	2.11 - 7.76	
Moving means			0.019
Walk	1	-	
Motorbike	6.01	0.90 - 43.8	
Car	10.4	1.56 - 75.5	
Family members are usually obese			<0.001
No	1	-	
Yes	3.49	1.70 - 7.46	
Poultry consumption			0.025
Rarely	1	-	
Frequently	2.01	1.09 - 3.76	
Consumption of corn dough			0.001
Rarely	1	-	
Frequently	3.94	1.72 - 9.57	
Snacking			0.007
No	1	-	
Yes	2.83	1.33 - 6.30	
High blood pressure			<0.001
No	1	-	
Yes	7.65	3.46 - 18.5	
Diabetes			<0.001
No	1	-	
Yes	24.5	9.74 - 76.6	

4. Discussion

The objective of the present study was to determine the prevalence of overweight and its associated factors among workers of the Ministry of Labor and Public Service in 2023.

The results of this study provide valuable insight into the prevalence of overweight and associated risk factors among workers in the Ministry of Labor and Civil Service in 2023. The high prevalence of overweight (63.32%) is alarming, although it is lower than that observed in other professional contexts, such as those reported by Zubery *et al.* [10] and Richard GK *et al.* [11]. These differences can be attributed to various variables, including environmental differences, dietary habits, and physical activity levels specific to each group of workers.

The prevalence of overweight in our study, although high, is lower than that reported by Zubery *et al.* [10] among health workers, teachers and bankers in Tanzania, as well as by Richard GK *et al.* [11] among nurses in Scotland. These occupations, particularly those related to healthcare and banking, are often associated with high levels of stress, a sedentary lifestyle, and irregular work schedules, which could explain the higher rates of overweight in these populations. On the other hand, the prevalence observed in our study is higher than that reported by Addo PNO *et al.* [12] among employees of financial institutions in Ghana. This difference could be due to the relatively more stressful and less active working conditions in the ministry context compared to financial institutions or to cultural and dietary variations.

At the end of the multivariate analysis, the potential predictive factors associated with overweight found among agents of the Ministry of Labor and Civil Service were sex, means of travel to get to the service, family members generally obese, poultry consumption, corn dough consumption, snacking, high blood pressure and diabetes. The association between sex and overweight in our study is in line with the results of several previous studies [12] [13]. Women, in particular, tend to be more affected by excess weight, which could be linked to biological, hormonal, but also sociocultural factors. Social norms and gender roles, which influence physical activity, diet and weight management, could explain this difference.

The mode of travel to work, particularly car use, was significantly associated with being overweight. This result corroborates the observations of Zubery *et al.* [10], who demonstrated that workers using cars or public transport were more likely to be overweight ($p = 0.029$). Driving to work is often associated with a reduction in daily physical activity, which contributes to the accumulation of excess weight. Additionally, stress related to car travel could also play a role in this association.

The strong link between being overweight and having generally obese family members ($p < 0.001$) highlights the importance of genetic and environmental factors in the predisposition to overweight. This result is consistent with the study by Barbadoro P *et al.* [14], which showed that individuals with a family

history of obesity were significantly more likely to be overweight themselves ($p = 0.002$). This inheritance could be explained by shared eating habits and lifestyles within families, as well as genetic factors. Dietary habits such as frequent consumption of corn dough, poultry and snacking were strongly associated with overweight. These results are in line with those of Mbochi R.W. *et al.* [15], who also found that diets rich in cereals, dairy products and meat were associated with increased overweight ($p < 0.001$). These eating behaviors, often observed among workers with relatively high incomes, could be linked to greater availability of these foods and to food choices influenced by sedentary lifestyles and cultural habits. The significant association between overweight, high blood pressure, and diabetes ($p < 0.001$) reflects the deleterious effects of excess weight on metabolic health. As reported by Addo PNO *et al.* [12], being overweight exacerbates the risk of developing these conditions, creating a vicious cycle where being overweight leads to metabolic diseases, which in turn makes being overweight worse.

5. Limit of the Study

The study does not include certain potentially important variables, such as stress level, quality and quantity of food ingested, which could influence the relationship between the identified risk factors and excess weight.

Indeed, diet quality, for example, can have a significant impact on body weight, regardless of total calorie consumption or the specific types of foods consumed. Similarly, chronic stress is a contributing factor to being overweight, but it was not assessed in this study. The inclusion of these variables could have allowed a more complete understanding of the determinants of overweight in this population.

6. Conclusion

Female gender, work-related car travel, generally obese family members, frequent consumption of corn dough, snacking, high blood pressure and diabetes significantly increase the risk of overweight among Ministry of Health workers. Work and public services. These factors should be the focus of workplace prevention programs to reduce the burden of overweight among this category of workers.

Conflicts of Interest

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

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Appendix

SURVEY ON THE DETERMINANTS OF OVERWEIGHT AND ASSOCIATED MORBIDITY IN THE PROFESSIONAL ENVIRONMENT IN BENIN IN 2023: CASE OF THE MINISTRY OF LABOR AND PUBLIC SERVICE

QUIZ

1) Name of the investigator: _____

2) N° socket: /___/___/___/

3) Date: /___/___/ /___/___/ /___/___/ ___/___/

4) N° IT: /___/___/___/ /___/___/___/

I. SOCIODEMOGRAPHIC INFORMATION

5) Date of birth: /___/___/ /___/___/ /___/___/___/

6) Age: /___/___/ years (completed age)

7) Gender: Male /___/ Female /___/

8) Ethnic origin: _____

9) Marital status: Single /___/ Cohabitation /___/ Married /___/ Divorced /___/ Widowed /___/

10) Number of children: /___/___/

II. PROFESSIONAL INFORMATION

11) Professional qualification

12) Orientation

13) Workstation

III. ANTHROPOMETRIC MEASUREMENTS

14) Weight: /___/___/___/kg

15) Size: /___/___/___/ m

16) Blood pressure: /___/___/___/ /___/___/___/ mmHg

17) Waist measurement: /___/___/___/ m

IV. BEHAVIORAL INFORMATION

A. Eating habits

18) *How often do you eat peanuts and peanut products (roasted peanuts, kluiklui, nouga, konkada)?*

Every day /___/ Several times a week /___/ Once a week /___/

Several times a month /___/ Once a month /___/ Rarely/never /___/

19) *How often do you eat poultry (chicken, duck, turkey, guinea fowl)?*

Every day /___/ Several times a week /___/ Once a week /___/

Several times a month /___/ Once a month /___/ Rarely/never /___/

20) *How often do you eat red meat (beef, mutton, goat, pork)?*

Every day /___/ Several times a week /___/ Once a week /___/

Several times a month /___/ Once a month /___/ Rarely/never /___/

21) *How often do you eat eggs?*

Every day /___/ Several times a week /___/ Once a week /___/
Several times a month /___/ Once a month /___/ Rarely/never /___/

22) How often do you consume dairy products (milk, yogurt, cheese)?

Every day /___/ Several times a week /___/ Once a week /___/
Several times a month /___/ Once a month /___/ Rarely/never /___/

23) How often do you eat vegetables (amaranth, nightshade, fôtètè, lettuce, eggplant, cucumber, cabbage, carrot)?

Every day /___/ Several times a week /___/ Once a week /___/
Several times a month /___/ Once a month /___/ Rarely/never /___/

24) How often do you eat fruits (orange, papaya, mango, guava, pineapple, tangerine, apple, etc.)?

Every day /___/ Several times a week /___/ Once a week /___/
Several times a month /___/ Once a month /___/ Rarely/never /___/

25) How often do you eat pasta (corn, yam, millet, spaghetti, etc.)?

Every day /___/ Several times a week /___/ Once a week /___/
Several times a month /___/ Once a month /___/ Rarely/never /___/

26) How often do you consume soft drinks (coca-cola, Pepsi, Fizzi, Fanta, spirits, mocha)?

Every day /___/ Several times a week /___/ Once a week /___/
Several times a month /___/ Once a month /___/ Rarely/never /___/

27) How often do you consume sugary drinks (coca-cola, Pepsi, Fizzi, Fanta, Sprite, Mocha, syrup, fruit juice)?

Every day /___/ Several times a week /___/ Once a week /___/
Several times a month /___/ Once a month /___/ Rarely/never /___/

28) How often do you add sugar to your food or drinks?

Every day /___/ Several times a week /___/ Once a week /___/
Several times a month /___/ Once a month /___/ Rarely/never /___/

29) How often do you eat sweet foods (candy, nougat, sweet snacks, sweet bread, sweet biscuits, cakes)?

Every day /___/ Several times a week /___/ Once a week /___/
Several times a month /___/ Once a month /___/ Rarely/never /___/

30) How often do you eat chocolate?

Every day /___/ Several times a week /___/ Once a week /___/
Several times a month /___/ Once a month /___/ Rarely/never /___/

31) How many meals do you eat per day? /___/

32) Where do you eat these meals? (home, canteen, outside)

33) Do you ever snack? yes /___/ no /___/

34) If yes, what?

35) How often?

B. Physical activities

36) Here are five levels of activities; check the box that suits you best, *i.e.*, what you do most often (single choice).

Profile	Example	Level of activities	Choice
Extremely inactive	No physical activity	1	
Sedentary	Less than 30 minutes of activity per day	2	
Moderately active	Walking, gardening or equivalent, gymnastics, yoga	3	
Vigorously active	Person doing two hours of swimming or other physical activities each day	4	
Very active	Regularly participates in competitions	5	

C. Sedentary lifestyle

37) How many hours do you usually spend watching TV per day? _____

38) How many hours do you usually spend in front of the computer per day? _____

39) How many hours do you spend in a fixed position (sitting, standing, etc.) during the day?

D. Sleep duration

40) At what time do you usually sleep in the evening? _____

41) What time do you usually wake up in the morning? _____

E. Alcoholism

42) Do you drink alcoholic beverages (beer, wine, soda)? Yes /___/ No /___/

43) If yes, how often? Times a day /___/ Times a week /___/

44) How many drinks do you drink per day? _____

F. Smoking

45) Do you use tobacco? Yes /___/ No /___/

46) In what form? Cigarettes /___/ Powdered tobacco /___/

47) How many cigarettes per day?

48) How often do you consume them? Times a day /___/ Times a week /___/

G. Drink coffee

49) Do you drink coffee? Yes /___/ No /___/

50) If yes, how many cups per day? _____

H. Taking medication

51) Do you take any medications? Yes /___/ No /___/

52) If yes, since when? _____

53) Name the medications you are taking:

54) Are you taking medication to prevent pregnancy? Yes /___/ No /___/

55) If yes, which ones? _____

56) Do you take medication to avoid fatigue or work better? Yes /___/ No /___/

57) If yes, which ones? _____

V. SOCIOCULTURAL INFORMATION

58) Do you often feel stressed as a family? Yes /___/ No /___/

59) Do you often feel stressed around your superiors? Yes /___/ No /___/

60) Do you often feel stressed around your colleagues or collaborators? Yes /___/ No /___/

61) Are your professional responsibilities causing you stress? Yes /___/ No /___/

62) If so, what do you do in any of these cases? (nibble, lie down, ...)

63) What do you think about overweight and obesity?

64) Do you know the consequences of being overweight? Yes /___/ No /___/

65) If so, cite them. _____

66) Is one of your parents obese? Yes /___/ No /___/

67) Are your family members generally obese? Yes /___/ No /___/

68) What status do you have in the house where you live? Owner /___/ Tenant /___/ Family home /___/

69) Do you have land? Yes /___/ No /___/

70) What is your lighting source? Electric energy /___/ Battery lamp /___/ Oil lamp /___/

71) What is your source of energy for cooking?

Electricity /___/ Gas /___/ Coal /___/ Wood /___/ Oil stove /___/

72) What is your means of information? Television /___/ Radio /___/ Both /___/ None /___/

73) What is your means of communication? Landline /___/ Mobile phone /___/ Internet /___/ None /___/

74) What is your means of transport? Car /___/ Motorcycle /___/ Bike /___/ Walking /___/

75) What is your source of water supply? SONEB /___/ Well /___/ Drilling /___/

76) What is the floor in your house made of? Cement /___/ Sand /___/ Tiles /___/

77) What type of toilet do you use?

Improved private toilets (flush latrines, ventilated pit latrines) /___/

Basic toilets (facilities shared with others, no toilets, unventilated pit latrines) /___/

VI. MEDICAL INFORMATION

78) Do you suffer from one or more of the following illnesses?

(Circle the letters corresponding to your positive answers):

a) Heart failure or coronary artery disease

b) Respiratory failure

c) Diabetes

d) HIGH BLOOD PRESSURE (HBP)

e) Gonarthrosis or coxarthrosis

f) Spinal pain

g) Depression

h) Paralysis of one (or more) limbs

The designer is the author.