ORIGINAL ARTICLE

Level of physical activity and eating behavior: Risk factors associated with sedentariness among obese employees of a company in the city of Kinshasa province, Democratic Republic of Congo

Niveau d'activité physique et comportement alimentaire : facteurs de risque associés à la sédentarité chez les employés obèses d'une entreprise de la ville de Kinshasa, République démocratique du Congo

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Summary

Objective. — The objective is to determine the level of physical activity, eating behavior and risk factors associated with sedentariness among obese employees of the Multimodal Freight Management Office of Kinshasa (OGEFREM).

Method. — Cross-sectional study of the 157 obese employees, of which, 76 (48.4%) men and 81 (51.6%) women, aged 18 to 59 years were randomly selected. The level of physical activity was measured by the International Physical Activity Questionnaire (IPAQ) and the eating behavior by the Three-Factor Eating Questionnaire (TFEQ-R 18). The description of the sample was made possible by calculating the proportions and averages. The Student's *t*-test and Chi-square test were used to compare the variables according to level of physical activity and socio-professional status. Logistic regression was used to identify independent determinants of physical inactivity and sedentary behavior. $P < 0.05$ was defined the statistical significance level.

Results. — Of the 157 questionnaires collected, 48.4% of men and 51.6% of women show that 59.2% of the study population has a low level of physical activity, and 58.5% a cognitive

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restriction. The average values of the following parameters: weight, BMI, Waist circumference, systolic blood pressure, diastolic blood pressure, mean arterial pressure, pulsed pressure, blood glucose, total cholesterol, triglyceride, total body fat, visceral fat and lean mass are 85 ± 9.7 kg, 32.6 ± 2.9 kg/m^2, 99 ± 13.0 cm, 135.6 ± 17.0 mmHg, 92.1 ± 14.5 mmHg, 106.6 ± 14.3 mmHg, 43.5 ± 12.0 mmHg, 129 ± 23.9 mg/dl, 228 ± 18.7 mg/dl, 169 ± 19.5 mg/dl, $39.7 \pm 10.8\%$, $8 \pm 8.9\%$ and $28.9 \pm 9.4\%$ respectively. The probability of having a low level of physical activity and sedentary behavior was 5 times higher among employees spending more than three hours of time sitting on the computer (OR aj $= 5.188$; 95% CI (1.389—7.318), $P = 0.006$), 3 times higher among employees over three hours of time sitting in front of the television (OR aj $= 3.042$; 95% CI (1.155—8.012), $P = 0.02$), 3 times higher among employees who spent more than three hours of reading time (OR aj $= 3.456$; 95% CI (1.294—5.677), $P = 0.006$ and with cognitive dietary restriction (OR aj $= 3.188$; 95% CI (1.389—7.318), $P = 0.006$), cognitive dietary restriction (OR $= 3.188$; 95% CI (1.389—7.318), $P = 0.006$) and also 3 times higher among employees with high socio-occupational status (OR aj $= 3.57$; 95% CI (1.77—6.68), $P < 0.015$).

Conclusion. — The obese employees of the Multimodal Freight Management Office of Kinshasa have a low level of physical activity and cognitive food restriction. More than three hours of time spent on the computer increases the risk of becoming inactive and sedentary 5 times. On the other hand, more than three hours of time spent watching television and cognitive restriction as well as the high socio-professional status increases it three times and is positively associated with morphological, physiological, lipidic profiles and body composition. In contrast, they are associated with a decrease in muscle mass and high-density lipoprotein.

MOTS CLÉS
Activités physiques ;
Comportement
alimentaire ;
Régime alimentaire
non-contrôlé ;
Restriction cognitive.

Résumé
Objectif. — L'objectif est de déterminer le niveau d'activité physique, le comportement alimentaire et les facteurs de risque associés à la sédentarité chez les employés du Bureau de gestion du fret multimodal de Kinshasa (OGEFREM) atteints d'obésité.
Méthode. — Étude transversale de 157 employés obèses, dont 76 (48,4 %) hommes et 81 (51,6 %) femmes, âgés de 18 à 59 ans, sélectionnées au hasard. Le niveau d'activité physique a été mesuré à l'aide du questionnaire international d'activité physique (IPAQ) et le comportement alimentaire par le Three-Factor Eating Questionaire (TFEQ-R 18). Le test *t* de Student et le test du Chi^2 ont été utilisés pour comparer les variables en fonction du niveau d'activité physique et de statut socio-professionnel. La régression logistique a été utilisée pour identifier les déterminants d'inactivité physique et du comportement sédentaire.
Résultats. — Sur les 157 questionnaires recueillis, 48,4 % des hommes et 51,6 % des femmes soit 59,2 % de la population étudiée présente un faible niveau d'activité physique, et 58,5 % une restriction cognitive. Les valeurs moyennes des paramètres suivants : poids, IMC, tour de taille, pression artérielle systolique, pression artérielle diastolique, pression artérielle moyenne, pression pulsée, glycémie, cholestérol total, triglycérides, graisse corporelle totale, graisse viscérale et masse maigre sont de $85 \pm 9,7$ kg, $32,6 \pm 2,9$ kg/m^2, $99 \pm 13,0$ cm, $135,6 \pm 17,0$ mmHg, $92,1 \pm 14,5$ mmHg, $106,6 \pm 14,3$ mmHg, $43,5 \pm 12,0$ mmHg, $1,29 \pm 0,24$ g/l, $2,28 \pm 0,19$ g/l, $1,69 \pm 0,19$ g/l, $39,7 \pm 10,8$ %, $8 \pm 8,9$ % et $28,9 \pm 9,4$ % respectivement. La probabilité d'avoir un faible niveau d'activité physique et des comportements sédentaires était cinq fois plus élevée chez les employés qui passaient plus de trois heures assis devant un ordinateur (OU aj $= 5,188$; IC 95 % (1,389—7,318), $p = 0,006$), 3 fois plus élevée parmi les employés qui passaient plus de trois heures assis devant la télévision (OU aj $= 3,042$; IC à 95 % (1,155—8,012), $p = 0,02$), 3 fois plus élevée chez les employés qui ont passé plus de trois heures de lecture (OR ajusté $= 3,4456$; IC 95 % (1,294—5,677), $p = 0,006$ et avec restriction alimentaire cognitive (OR ajusté $= 3,188$; IC 95 % (1,389—7,318), $p = 0,006$), restriction alimentaire cognitive (OR $= 3,188$; IC95 % (1,389—7,318), $p = 0,006$) et aussi 3 fois plus élevée parmi les employés à statut socio-professionnel élevé (OR ajusté $= 3,57$; IC 95 % (1,77—6,68), $p < 0,015$).
Conclusion. — Les employés du bureau de gestion du fret multimodal de Kinshasa ont un faible niveau d'activité physique et une restriction alimentaire cognitive. Le fait de passer plus de trois heures sur ordinateur multiplie par 5 le risque de devenir inactif et sédentaire. Par ailleurs, fait de passer plus de trois heures à regarder la télévision, la restriction cognitive, et le niveau socio-professionnel élevé multiplient ce risque par 5, et sont associés à des perturbations morphologiques, physiologiques, lipidiques et de composition corporelle. Par contre, ces comportements sont associés à une diminution de la masse musculaire et des HDL.

1. Introduction

Physical activity is defined by the World Health Organization (WHO) and the Physical Activity Guidelines Advisory Committee (PAGAC) as ''any body movement produced by the contraction of skeletal muscles that increases energy expenditure over the expenditure of rest''. Physical activity is a complex, multidimensional behavior. For each activity, the characteristics to be taken into account are context, type, duration, frequency and intensity [1,2]. Worldwide, approximately 3.2 million deaths each year are attributed to lack of exercise. The decrease in physical activity occurs during adolescence and continues throughout one's life. It is linked to sedentary work, motorized modes of transport or passive leisure activities (television, video games...). Lack of exercise is considered the fourth leading risk factor for death worldwide [3]. One of the main risk factors for non-communicable diseases (NCDs) is unhealthy dietary behavior, along with excess energy intake [4]. These eating disorders are often underestimated in their severity and their impact on therapeutic possibilities [5]. Repeated failures often lead to loss of confidence, low self-esteem, depression, and increased disease incidence [6]. The framework enables the influence of the behavior of a large number of employees with respect to health. People must have the opportunity to make healthy choices in their workplace to be less at risk. In addition, the cost to the employer of the morbidity attributed to non-communicable diseases is increasing rapidly. The workplace should be used to make healthy eating choices and encourage exercise [7,8]. The change in lifestyle, with the increasingly sedentary nature of professional activities, the motorization of means of transport and household chores, has been accompanied by a decrease in physical expenditure of the population. However, the practice of a regular physical activity adapted in terms of frequency, duration, intensity and nature as well as the limitation of sedentariness, constitute with a healthy eating behavior, major factors of acquisition and maintaining a good state of health. Physical activity, as well as eating habits and behavior, is involved in the prevention of a large number of chronic diseases (cardiovascular diseases, diabetes, obesity, cancers) [9]. Despite the scientific interest in combating physical inactivity, sedentary lifestyle and poor nutritional behavior, as well as their predisposition to chronic noncommunicable diseases, no study has been conducted in the African workplace, particularly in the Republic of Korea and Democratic Republic of Congo. The purpose of this paper is to determine the level of physical activity, eating behavior and risk factors associated with sedentariness among obese employees of the Multimodal Freight Management Office in Kinshasa, Democratic Republic of Congo.

2. Methods

2.1. Type and scope of study

It is a descriptive and analytical cross-sectional study, which took place from 27 November 2013 to 27 January 2014, in thirteen [10] directorates of the so-called firm, Multimodal Freight Management Office of the city of Kinshasa, capital of the Republic of Congo. This industry specializes in the multimodal transport sector. Staffs do most of their work from 7:30 am to 3:00 pm while sitting on the computer.

2.2. Population and sampling

The company's employees, regardless of their rank (command or collaboration executives and enforcement agents) were recruited on a voluntary basis by performing a simple random draw. The population known to us was 400 employees of both sexes. The calculation of the minimum sample size was based on Robert and Daryle's formula [11]. Simple random sampling was used to build the workforce of 157 obese employees in our survey from the company's staff list. The inclusion criterion included being aged 18 and over and in good health, born of two Congolese parents and employed at the Multimodal Freight Office for at least one year of service. All selected participants provided informed consent prior to participating in the study.

2.3. Selection criteria

Included in this study was any agent of the Multimodal Freight Management Board (OGEFREM) who voluntarily and freely gave his informed consent to participate in the study.

2.4. Data collection

Data collected included socio-demographic characteristics (age and sex), occupational status (command frameworks, collaborative settings and enforcement agents), eating behaviors (cognitive restriction, uncontrolled diet and emotional eating) [12] and sedentary behaviors (setting more than three hours watching television, working on the computer and reading). The following anthropometric parameters: height in cm was measured using the Seca brand portable toe, while waist circumference (TT) in cm and hip circumference (TH) in cm by a metric tape. The morbid-mortal risks by the ratio Abdo-hip (RAH) in cm, the weight in kg and the body composition (the total body fat, muscular mass and intra-abdominal fat) by OMRON Brand Balance Inpedancemeter BF-511 Health care Netherlands/the Netherlands (Manufacturer/City/Country). The BMI in kg/m^2 was calculated by the mass (expressed in kilograms) divided by the square of the height of the person (in meters). The following lipid parameters: HDL-C, LDC-C, CT and triglycerides were measured in employees fasting for at least 12 hours on serum by clinical laboratory biologists of MOKOLE Hospital Center of Mont Ngafula in Kinshasa using the method colorimetric enzymatic and Elitech group kits (Sées, France). The physical activity questionnaire used was the IPAQ in its short form in French (Kohl et al., 2012, Hagstromer, Oja and Sjostrom 2006, IPAQ, 2005). There are three sections on high intensity physical activity, moderate intensity physical activity and low intensity physical activity, and four types respectively, physical activity, work, leisure, where employees must specify the number of days per week and the duration of each of these types of activities. It also includes a question about sedentary behavior with questions about the average time spent usually seated daily in sedentary occupations, namely television, computer

or video games and reading. Information on the motivations and factors limiting the practice of physical activity has also been requested [10,13,14]. To diagnose eating behavior, we used the questionnaire TFEQ-R 18 (Three-Factor EatingQuestionaire) with 18 questions [15]. It explores common dietary practices and evaluates three types of eating behavior: cognitive restriction is defined as the tendency to consciously limit food intake to be in good health. It is a voluntary constraint on eating behavior. This restriction is a deliberate choice whose purpose is weight control. The modalities of inhibition of food intake are variable (skipped meals, low calorie diets, fasting), as well as possible health control behaviors [15]. Uncontrolled feeding includes food compulsion and bulimic access. Food compulsion is characterized by the impulsive, sudden consumption of a given food, apart from a meal. In its most common form, the simple compulsion is triggered by a desire to eat and not by a feeling of hunger, and turns towards a food or a group of foods that are appreciated and characteristic for the same subject. Bulimic access is defined by episodes in which the subject, usually alone, consumes, without hunger and with gluttony of important foods. This ingestion takes place beyond any satiety, with no other limit than the gastric capacity of the subject [15,16]. Emotional eating is the ability to eat too much in relation to a negative or positive feeling when the individual feels anxious, depressed alone or happy [15,16]. PA was measured after 5 minutes of relaxation in a sitting position on the left arm carried at the level of the heart using a mercury sphygmomanometer; three consecutive doses in one minute interval were performed and their mean defined the PA of the patient. PAS and PAD corresponded respectively to Korotkoff sounds I and V. Poor body composition was defined as total body fat 20% in men and ^{3} 32% in women, intra-abdominal fat (visceral) > 9% in men and women and lean mass (Muscular) $\leq$ 33.3% for men and ^{3} to 24.4% for women [17,18]. The metabolic syndrome was defined according to the US National Cholesterol Education Program (NCEP-ATPIII, 2001), by the presence of 3 or more of the following risk factors: waist circumference $\geq$ 94 cm in men and 80 cm in women; Arterial pressure $\geq$ 130/85 mmHg; Triglycerides $\geq$ 150 mg/dl; HDL cholesterol < 40 mg/dl in men, < 50 mg/dl in women; Fasting blood glucose $\geq$ 110 g/l [5].

2.5. Statistical analyzes

The study data was encoded on Excel 2010 and analyzed on the SPSS 21.0 software. The data are expressed as mean $\pm$ standard deviation (SD) for normally distributed and median continuous variables (Interquartile Space, EIQ) for non-normally distributed variables. The qualitative variables are expressed as absolute frequency (relative frequency in percent). Student's t-test was used to compare the averages of 2 groups; the Mann-Whitney U test was used to compare the medians of 2 groups. The comparison of proportions was made using the Chi^2. Independent determinants of physical inactivity and sedentary lifestyles were identified using logistic regression, $P < 0.05$ defining the statistical significance threshold.

The protocol of the study was submitted and approved by the Ethics Committee of the Ministry of Public Health of the Democratic Republic of Congo. Respect for the Helsinki
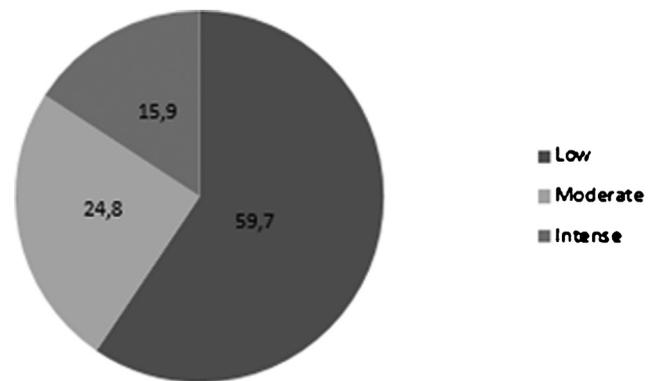

Figure 1   Distribution of study population by level of physical activity.
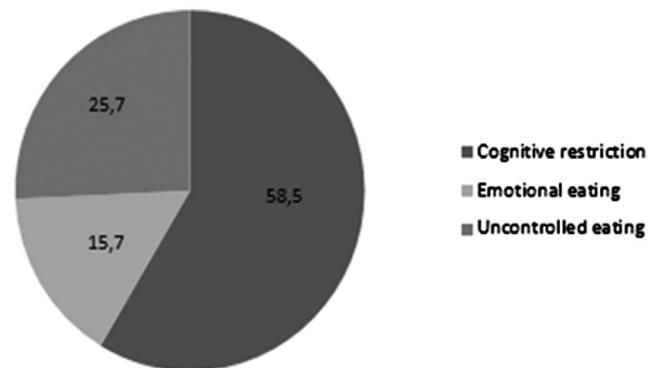

Figure 2   Distribution of the study population according to eating behavior.

principles for research on humans has been respected and the free and informed consent of the participants has been obtained.

3. Results

The overall frequency of physical activity level of employees of the Multimodal Freight Management Office is shown in Fig. 1.

Fig. 1 shows that the majority of the study population has a low level of physical activity (59.2%). Intense physical activity is found in 15.9% of employees while it is moderate in 24.8%. The overall incidence of food behaviors for employees of the Multimodal Freight Management Office is shown in Fig. 2.

Fig. 2 shows that cognitive restriction is found in 58,5% of employees, 25.7% uncontrolled eating and 15.7% in emotional eating. Socio-demographic characteristics by socio-occupational status of employees are presented in Table 1.

The average age of employees was 47 ± 9.54 years. The age of over 40 years predominated, with 71.3%. The female sex was more represented with a frequency of 51.6% and a sex ratio M/F of 1.0. Comparatively, between different socio-professional categories, we noted a significant difference between the level of physical activity ($P = 0.002$), age ($P = 0.012$) and sex ($P = 0.003$), depending on

Table 1 Socio-demographic characteristics by socio-professional status.

Variables	Entire group n = 157	Commanders n = 75	Frames collaborators n = 52	Executives n = 30	P
LPA:Low	93(59.2%)	71(45.2%)	21(13.3%)	1(0.6%)	0.002
Moderate	39(24.8%)	3(1.9%)	24(15.2%)	12(7.6%)	
Intense	25(16%)	1(0.6%)	7(4.4%)	17(10.8%)	
Age (X ± SD)	47 ± 9.54	47.9 ± 9.4	46.8 ± 8.2	46.3 ± 13.6	0.012
< 40 years old	45(28.6%)	28(17.8%)	8(5%)	9(5.7%)	
≥ 40 years	112(71.3%)	47(29.9%)	44(28%)	21(13.3%)	
Sex					
Male	76(48.4%)	33(21%)	29(18.4%)	14(8.9%)	0.003
Female	81(51.6%)	42(26.7%)	23(14.6%)	16(10.1%)	

X: mean; SD: Standard deviation; ±: more or less.

Table 2 Type of physical activity (TPA), limiting factors of physical activities, eating and sedentary behavior according to socio-professional status.

Variables	Entire group n = 157	Commanders n = 75	Frames collaborators n = 52	Executives n = 30	P-value
TPA Low of	100(47.6)	51(24.3)	32(15.2)	17(8,1)	0.004
Work	49(23.3)	34(16.2)	9(4.3)	6(2.8)	
Leisure	61(29)	40(19)	11(5.2)	10(4.7)	
Shifting	47(22.3)	35(16.7)	7(3.3)	5(2.3)	
Powered	14(6.6)	5(2.3)	4(1.9)	5(2.3)	
Factors limited					
Problem of lack time	118(56.1)	54(25.7)	53(25.2)	11(5.2)	0.006
Not want	9(4.3)	2(1)	4(1.9)	3(1.4)	
Health problem	33(15.7)	16(7.6)	9(4.3)	8(3.8)	
Work Problem	50(23.8)	20(9.5)	13(6.2)	17(8.1)	
Comportment eating					
Cognitive restriction	123(58.5)	66(31.4)	39(18.6)	18(8.5)	
Uncontrolled	54(25.7)	35(16.7)	10(4.8)	9(4.2)	0.001
Emotional	33(15.7)	24(11.4)	3(1.4)	6(2.8)	
Sedentariness					
Time spent watching TV	52(24.7)	28(13.3)	14(6.6)	10(4.7)	
Time spent on the computer	141(67.1)	85(40.4)	30(14.2)	26(12.3)	0.0001
Time spent reading	17(8)	7(3.3)	8(3.8)	2(0.9)	

TPA: Type of Physical Activity.

the type of physical activity, motivations, limiting factors, and employee eating behaviors are shown in Table 2.

The type of physical activity that was frequently found among employees was work (47.6%) and leisure, with command executives predominating (24.3%). The dietary behavior observed in command cadres was cognitive restriction (31.4%) and uncontrolled diet (16.7%) while emotional eating accounted for 11.4%. This socio-professional category remains, compared to the other two, more than three hours sitting on the computer (40.4%) and watching television (13.3%). The frequencies of physical activity level and mean plus or minus standard deviation of clinical parameters as a function of nutritional status are presented in Table 3.

The level of low physical activity was significantly higher in obese type I (46.1% vs. 6,3% than in morbid obesity, P = 0.0001). The frequency of obesity type I and obesity II was significantly higher high if total body fat, visceral fat were very high (P = 0.0001). Decreased lean or muscle mass

(P = 0.0001) increased the rate of obesity type I and obesity type II. If the agent became more and more inactive, the rate of obesity type I and obesity type II increased significantly with the level of physical activity. The cardiovascular risk factors related to the metabolic syndrome as a function of the level of physical activity are presented in Table 4.

Cardiovascular risk factors related to the metabolic syndrome were significantly higher among inactive employees (P = 0.0001). If the agent became more active, the cardiovascular risk factors related to the metabolic syndrome increased significantly with the level of physical activity (P < 0.0001). Table 5 presents the determinants of physical inactivity (Low Physical Activity Level) and sedentary behavior.

In univariate analysis, the time spent on the computer, the time spent watching television, cognitive restriction, uncontrolled diet, the female sex, the age of over 40 years and the high socio-professional status are the determinants

Table 3 Frequencies of physical activity level and mean clinical parameters by nutritional status.

Variables	Obesity type I (BMI: 30—34,5 kg/m^2) $n=101$	Obesity type II (BMI: 35—39,5 kg/m^2) $n=50$	Morbid obesity (BMI $\geq$ 40 kg/m^2) $n=13$	P-value
LPA Low, n(%)	97(46.1)	48(22.8)	10(6.3)	0.0001
LPA Moderate, n(%)	3(1.4)	1(0.4)	2(1.2)	0.041
LPA Intense, n(%)	1(0.4)	1(0.4)	1(0,4)	0.035
Weight (kg)	84 ± 12.0	95 ± 10.4	105 ± 8,8	0.036
Height (m)	1,64 ± 0.10	1,63 ± 0.07	1,62 ± 0.07	0.389
BMI (kg/m^2)	32,3 ± 3.5	36,5 ± 2.8	40,3 ± 4.9	0.0001
Total fat (%)	40 ± 12.2	39,6 ± 9.9	38,4 ± 10.4	0.0001
Visceral fat (%)	11,2 ± 9.7	10,8 ± 8.7	9,6 ± 8.3	0,0001
Lean mass (%)	20 ± 6.7	21,7 ± 9.4	31,9 ± 9.4	0.0001

LPA: level of physical activity.

Table 4 Cardiovascular risk factors related to metabolic syndrome by level of physical activity.

FRCV related to SM	Low $n=71$	Moderate $n=53$	Intense $n=33$	P-value
Waist circumference (cm)	99 ± 13.0	79.8 ± 10.8	78.69 ± 10.6	0.0001
Blood glucose (mg/dl)	129 ± 24.8	129 ± 27.0	126 ± 29.0	0.031
CT (mg/dl)	228 ± 18.7	210 ± 17.3	208 ± 18.5	0.057
HDL-C (mg/dl)	38.6 ± 18.5	85 ± 24.0	86 ± 22.9	0.002
LDL-C (mg/dl)	170 ± 13.9	162 ± 14.8	160 ± 14.6	0.381
Triglycerides (mg/dl)	169 ± 19.5	150 ± 19.5	148 ± 17.3	0.001
PAS (mmHg)	135.6 ± 17.0	127.2 ± 15.3	102.3 ± 20.3	0.045
PAD (mmHg)	92.1 ± 14.5	82.5 ± 11.8	73.1 ± 15.9	0.028

FRCV: Cardiovascular Risk Factors; SM: Metabolic Syndrome.

Table 5 Determinants of physical inactivity (low physical activity level) and sedentary behavior.

| Variables			Univariate analysis			Multivariate analysis		
			P	OR Gross	CI 95%	P	OR aj	CI 95%
Sedentary behavior				1				
Timespent watching TV	0.002	2.71	1.171	0.024	3.042	1.155		
Time spent on the computer	0.003	5.064	1.477	0.006	5.188	1.389		
Time spent reading			0.012	2.12	1.183	0.006	3.456	1.294
Total sedentary time			0.039	0.928	0.865	0.044	0.422	0.852
Food behavior				1				
Uncontrolled			0.005	2.874	1,379	0.054	2.19	0.987
Emotional			0.039	0.928	0.865	0.044	0.422	0.852
Food restriction			0.003	3.064	1.477	0.006	3.188	1.389
Sex				1				
Male			0.008	0.998	0.996	0.011	0.697	0.994
Female			0.000	4.756	2.029	0.603	1.334	0.451
Age				1				
< 40 years old			0.000	6.5	2.724	0.881	1.093	0.341
$\geq$ 40 years			0.000	4.926	3.987	0.514	1.599	0.39
Socio-professional status				1				
Commanders	0.034	5.05	1.13	0.015	3.57	1.77		
Collaboration frameworks			0.041	2.288	1.035	0.163	1.89	0.773
Executing agents			0.017	0.962	0.931	0.433	0.986	0.951
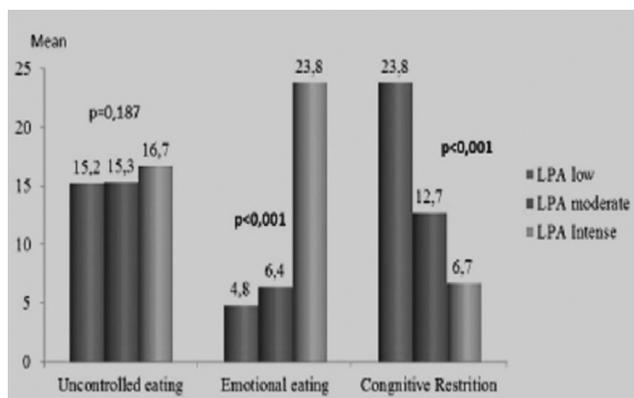
Figure 3 Correlation between level of physical activity and eating behavior of obese workers in Kinshasa.

of physical inactivity and sedentary behavior. After adjustment, the probability of having a low level of physical activity and sedentary behavior was 5 times higher among employees spending more than three hours of time sitting on the computer (OR aj = 5.188; 95% CI (1.389—7.318)), P = 0.006), 3 times higher among those sitting in front of the television (OR aj = 3.042; 95% CI (1.155—8.012), P = 0.024), 2 times higher among employees spending more than three hours of sitting time to read (OR aj = 3.456; 95% CI (1,294—5,677), P = 0.006 and cognitive restriction (OR aj = 3.188; 95% CI (1.389—7.318), P = 0.006) as well as 3-fold higher in those with a high socio-professional status (OR aj = 3.57; 95% CI, 1.77—6.68), P < 0.015). The correlation between level of physical activity and eating behavior of obese workings in Kinshasa is shown in Fig. 3.

Fig. 3 shows that uncontrolled feeding has no influence on the level of physical activity (P = 0.187); emotional eating was significantly significant on average when the level of physical activity was intense, while cognitive restriction decreased when the level of physical activity was intense (P = 0.001).

Discussion

This study was conducted to determine the level of physical activity and eating behavior of obese employees of the Multimodal Freight Management Office in Kinshasa, capital of the Democratic Republic of Congo. The prevalence of low physical activity level (physical inactivity) among obese employees was 59.2%. It is higher than that (10 to 46%) of the study of The International Prevalence Study on Physical Activity: results from 20 countries, carried out from 2002 to 2004 on a population aged 18 to 65 years and used, like us, the same questionnaire IPAQ [19]. The prevalence of eating disorders expressed by cognitive restriction was 58.5% followed by 25.7% for uncontrolled feeding. This result is close to those of Kusuayi et al., 2018 [4,20]. The level of low physical activity or physical inactivity was predominantly among commanders (45,2%) over 40 years (29,9%) females (26,7%), and decreased with age, sex and socio-pressure status. This result is consistent with those of Muller et al. (2006) and INSEE (2003) as well as that of Kantomaa et al. (2007) who observed that, the more one occupies the functions of command and one As age increases, the level of

physical activity decreases and sedentary behavior increases [21—23].

In the Lafay survey (2009), 48.4% of men and 41.3% of women were inactive [23]. This physical inactivity was in the order of 63.9% for men and 29.5% for women in the ENNS national health nutrition study (2006—2007) [24—26]. The majority of responses (47.6%) of employees to the question of type of low physical activity are those related first to work, then to displacement (29%). They are more oriented towards sedentary or motorized movement than active (22.3% against 6.6%). Our results are similar to those obtained by the survey, barometer health nutrition 2010 that is 57.7% [27]. The first reason for physical inactivity advanced by employees is related to lack of time. The higher the function, the poorer the eating behavior (P = 0.001). In our study, cognitive restriction (31.4%) and uncontrolled eating (16.7%) were identified more frequently among commanders, as they are those for whom, leisure motivation is low (6.7%). These are more likely to give health as a reason for motivation. Uncontrolled feeding has no influence on the level of physical activity, as shown in this study; emotional eating was significantly significant on average when the level of physical activity was intense, while cognitive restriction decreased when the level of physical activity was intense. In addition; this study observed that, sedentary employees had a tendency to limit eating more, hence, a clear increase in restriction. This may indicate that sedentary behavior leads to a tendency to eat more, but these workers adopt restrictive strategies to reduce appetite and food intake. These results correspond to those of the Baromètre santé (2000) survey, Brun and Guiraudou et al. (2013) [28—30]. Our study also showed that 40.4% of command executives spend more than three hours of time on the computer and 13.3% watch television. We also observed a positive association between sedentary behavior, eating behavior and high socio-professional status (P = 0.0001). The higher the grade, the more sedentary one becomes and the eating behavior is changed. This finding is consistent with those of Beryman et al., 2008, de Burton et al., 2000 as well as those of Burnette et al., 2008 who noted that high socio-occupational status is intimately associated with physical inactivity, eating behavior and sedentary lifestyle [31—33]. Finally, our investigation showed that working time beyond three hours on the computer, watching television, having cognitive restriction and belonging to high socio-professional status, increased the risk of becoming inactive by 3 to 5 times/or sedentary. A positive relationship was observed between morphological, physiological, lipid profiles, body composition and sedentary behavior (P = 0.001) [34,35]. In contrast, these same profiles are associated with a decrease in muscle mass and high-density lipoprotein (P = 0.002). This result is consistent with those of Beunza et al. (2007), from Ekelund et al. (2009), by Fung et al. (2000), Helmerhorst et al., 2009 who studied the relationship between time sitting on the computer, in front of television and the bio marker of cardiovascular risk factors [36,37]. However, it is easy to emphasize as Gardiner et al. (2011b), Gomez-Cabello et al. (2012), Gao, Nelson and Tucker (2007), Gennuso et al. (2013), Stamatakis et al. (2012) said that sedentary lifestyle is related to an increase in morphological profile, physiological and body composition [38—42].

Conclusion

Obese employees of the Multimodal Freight Management Office in Kinshasa have a low level of physical activity and a cognitive food restriction. The time they spend more than three hours on the computer increases the risk of becoming inactive and sedentary 5 times. On the other hand, this same time increases 3 times to watch television and to read as well as to have the cognitive restriction. It is linked to high socio-professional status. In contrast, the parameters studied are associated with a decrease in muscle mass and high-density lipoprotein. Emotional eating was significantly significant on average when the level of physical activity was intense, while cognitive restriction decreased when the level of physical activity was intense. Obesity and the metabolic syndrome are common pathologies in the workplace where physical inactivity and an unhealthy eating habit are key modifiable risk factors. Awareness raising and the development of a structured exercise intervention program combined with low-calorie, low-salt, high vitamin and fiber nutrition education is urgently needed to improve health in the workplace.

Disclosure of interest

The authors declare that they have no competing interest.

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