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Prevalence of Overweight Among Students at the University of Lubumbashi, DRC

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Abstract: *Introduction:* Overweight among students is a worrying public health problem in student communities in Lubumbashi because of their potential repercussions and their increasing frequency on health. The objective of our study is to identify the prevalence of overweight in a student environment in Lubumbashi. *Methods:* This is a study conducted on 200 subjects whose data comes from students of the University of Lubumbashi living in the home internet of UNILU, academic year 2020-2021, Our work results from a descriptive study transverse. For each UNILU student, weight and height were measured and were used to calculate the body mass index (BMI). Analysis and data collection were performed with Open data kit, Excel 2016 and Stata SE 16. *Results:* In all students aged 17 to 34, of which n = 82 (41%) girls and n = 118 (59%) boys made up our sample. The averages of weight, height and BMI are respectively 61.05kg (i.e., 62.74kg for boys and 58.70kg for girls); height 164.98cm (i.e., 166.35cm for boys and 163.08cm for girls) and BMI is 22.50kg / m^2 (i.e., 22.75kg / m^2 for boys and 22.16kg / m^2 for girls). The prevalence of overweight in our study is 20.5%, n = 200, respectively. *Conclusion:* Overweight among students in a student environment is a reality in the university environment of Lubumbashi. In the absence of national data, our study offers a statistical estimate of the emergence of this phenomenon in students. The figures provided by our study encourage us to be aware of this scourge and reflect the importance of the problem.

Keywords: Prevalence, Overweight, Student Environment

1. Introduction

Since 1997, the World Health Organization has considered overweight to be an epidemic, and thus has defined it as the epidemic of the 21st century. [1]. Overweight has become the most common nutritional pathology in industrialized countries as well as in the rest of the world. According to WHO forecasts in 2015, some 2.3 billion adults aged 18+ are overweight and over 700 million will be obese [2] when?,. The world is now more overweight than malnourished, the World Health Organization says: one billion people are overweight while 800 million people are hungry [3]. Being overweight is a well-known risk factor for various health problems such as: digestive disorder, cancer, bone joint, type II diabetes mellitus, and cardiovascular disease etc. all this condition can lead to premature mortality if care is not wanted at the first stage of treatment [4]. In the African region, many countries have necessarily focused their efforts primarily on undernutrition and food security. As a result, overweight trends have only been documented in a few African populations or countries [5]. From the fragmentary and limited data available on the prevalence of overweight, it appears that the latter exists in both developing and more developed countries in the African region, particularly among

girls [6]. The results of a provincial health survey conducted in the Democratic Republic of the Congo in the city of Lubumbashi January 28, 2019 demonstrated that: the BMI was 18.82 ± 3.15 kg / m^2 (i.e. 19.39 ± 3.39 kg / m^2 for boys and 18.17 ± 2.71 kg / m^2 for girls) and The prevalence of overweight was 8% and that of obesity was 1%. Girls were significantly more affected by overweight (10.7% girls vs. 5% boys) and obesity (1.5% girls vs. 0.4% boys). Worldwide trends in body-mass index, underweight, overweight, and obesity from 1975 to 2016: a pooled analysis of 2416 population-based measurement studies into 128·9 million children, adolescents, and adults [7]. The socioeconomic and cultural flavor also a major cause for overweight, this factor explains the development of overweight in people marginally poor. But what about the persistence of being underweight? It seems obvious that the improvement of the GNP "gross national product" of the inhabitants in the Democratic Republic of Congo, a country in socio-economic transition, does not benefit citizens in an equitable way [8].

The fields of health is more particularly here the problem of overweight is now part of the challenges of public education. The figures show, the way of life, the quality of food and meals is another cause, the lack of physical activities as well [9].

The risks are known, the cost for society is high, especially the well-being and development of students who are often hampered [10]. The state, university schools, universities, institutes of higher education and certain partners have fully understood what is at stake in this issue. However, it is clear that prevention programs come almost from all private sectors, that interventions are very often limited in time, that they are not free and that not all students have access to them. Being overweight is caused by an energy imbalance. In other words, the individual does not expend enough calories in a day, compared to the amount they consume in the form of food, which results in weight gain due to calorie accumulation [11]. But, beyond this definition, are there any factors that could explain why this tendency to imbalance has increased exponentially in recent years?

On the other hand, overweight and obesity of disease conveying together, tend to increase globally [12], This problem makes all the actors and health professionals think. This health disaster at a huge cost in terms of money and human lives [13].

If the causes and consequences are well established at the present time, the means to fight against this scourge will be less. Prevention therefore plays a key role in educating young people today in order to make them responsible people tomorrow [14].

The study of overweight among students is of great interest to our developing country (DRC) in which this risk factor seems to be increasing every year on the national territory. These updated topic is echoing weight fluctuation data associated with an increased prevalence of overweight [15]. Emphasis is placed on prevention and reduction of incidences, assessment of the extent and trend of overweight in a student environment and changes in nutritional as well as cultural behavior in students through a prevalence of overweight in the student environment [16].

This subject is of interest both scientifically and socially. Scientifically: this work contributes to the enrichment of the existing literature on the phenomenon "Overweight"; it also allows other researchers to be able to contribute more on this theme until this global phenomenon is attenuated. In addition, everyone has their level where they find themselves must feel called to work in the direction of the recovery of this global phenomenon. The prerequisites would be: the implementation of sedentary activities in the community. The objectives for this study were to:

Determine the socio-demographic characteristics of overweight among students in a student environment in Lubumbashi;

Identify the prevalence of overweight among students in the Lubumbashi academic year student environment.

2. Patients and Methods

2.1. Study Framework

This study was carried out at the University of Lubumbashi in acronym “UNILU”, in the city of Lubumbashi, province of Haut-Katanga in the Democratic Republic of Congo.

The University was established in 1955 under the name Official University of Congo and Ruanda-Urundi by the Free University of Brusselss (Belgium), and opened in 1956.

In 1960, it was replaced by Elisabethville State University, under the tutelage of the University of Liège, then became the official University of Congo in 1963.

In 1971, following the regrouping of Universities and higher institutes in University Congo National, the site becomes the National University of Congo / Campus of Lubumbashi, and in 1972, by iridescence, the National University of Zaire / Campus de Lubumbashi (UNAZA / Lubumbashi). The students of UNILU are called Kasapards, a name full of sarcasm and humor, taken from the name of the district which shelters the large prison of Kassapa, the military camp and the university cities located all at the level of the city of Lubumbashi [29].

2.2. Study Population and Sampling

The study population consisted of all students from the University of Lubumbashi. Therefore, we had to proceed by simple random sampling.

Included in this study are data from students of the University living on the university campus, from home 1 to 10, as well as all students.

Are not excluded in this study, all the data from the students who live on the campus of this University, but who did not respond to the research protocol, refused to answer the research questionnaire and who will not be present during the days, of the investigation.

2.3. Description of Study Variables

Sociodemographic variable: Gender; home department

number; religion, marital status; profession; level of study; have you ever waited to talk about being overweight; nutritional status, is overweight inherited in your family.

Anthropometric variable: Age, height, weight.

Physical activity: You play sports; Who; How many sessions per week; why you play sports.

Sedentary lifestyle: usually you consume the drink after meals; Who; do you have a balanced food intake; How much time do you spend sitting or lying down on a typical day.

2.4. Estimated Workforce

As we specified previously on the type of simple random sampling chosen previously for our study, it is recommended that we estimate the size of the sample of the University of Lubumbashi on which we are going to ping, it is as we saw fit to define it through the SCHWARTZ formula:

n =sample size;

z = confidence level at 1.96;

& = degree of precision for a risk 0.05;

e= absolute margin of error on the estimate of the expected proportion 0.05;

p: the prevalence of overweight in the DRC in 2018 (0.13), i.e., 13% [7].

$$n = \frac{z^2 \& (1 - \& \div 2) \times p(1-p)}{e^2}$$

APPLICATION:

$$n = \frac{1{,}96^2 (1 - 0{,}05 \div 2) \times 0{,}13(1-0{,}13)}{0{,}05^2}$$

$$n = \frac{3{,}8416 \times 0{,}975 \times 0{,}1131}{0{,}0025} = 169{,}4491 \text{ soit } 169$$

For more precision finally not to fall below our sample, 10% of the size of the sample was added to reach the effective. Which comes down to: n = 169 × 10/100 = 16.9 + 169 = 185.9 ~ 186 students. But in terms of our study, we worked on 200 students. This number was divided by the number of homes (10 homes), so we had 20 students per home for a sample of 200 students.

2.5. Data Collection Technique

It all started with a personal presentation as well as the presentation of the problem. This present work concerns anthropometric, socio-economic, physiological data and modules on food consumption, sedentary activity, psycho-social aspects. The Body Mass Index was calculated by the following formula:

$$\text{IMC} = \frac{\text{poids(kg)}}{(\text{taille(m)})^2}$$

Normal weight if: BMI = 18.5-24.9; Overweight if: BMI = 25-30.

The height and weight threshold were measured according to WHO criteria for detecting overweight.

Regarding weight gain, an "omron" brand digital bathroom scale was used and a tape measure which enabled height measurement.

The investigation protocol was examined and finalized by the director of the manuscript in collaboration with the co-director, The administration of the Lubumbashi public health school of the investigation had made administrative contacts with us, with a view to the obtaining all the authorizations that can allow us to properly conduct our investigation.

2.6. Data Processing and Analysis

A survey sheet was checked in order to look for missing or aberrant data. Data processing was performed using Epi-Info software version 8.04. We had carried out the codification, entry and control of data during the survey using the ODK collect software, It allows to collect data using Android mobile devices and send them to a server online, even without an internet connection or mobile coverage at the time of collection. ODK Collect allows you to simplify the data collection process. Indeed, this solution replaces the traditional paper forms by electronic forms which make it possible to import text, numerical data, graphics, GPS coordinates, photos, videos.

A comparison between the entire sample and the overweight group was made for mean age, weight, height, and BMI.

2.7. Data Source, Period and Type of Study

This work took place at the University of Lubumbashi and more precisely at the University campus. The data collection was carried out over a period of 9 months (ranging from 03/27 to 10/16/2021) and a descriptive cross-sectional study was finally carried out to allow the evaluation of the prevalence of overweight in a student environment in Lubumbashi. from the University of Lubumbashi (UNILU). This study was carried out through a selection of internal homes (2 internal homes for girls and 8 internal homes for boys) from which the students were drawn at random.

3. Results

3.1. Sociodemographic Characteristics

On a population of 200 students aged 18 to 34 years surveyed, we found a prevalence of 99% of both sexes. Male sex was predominantly 59% (n = 118) and 41% female (n = 82).

3.2. Prevalence of Overweight

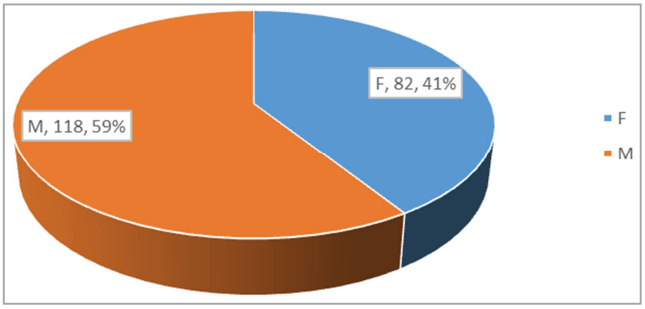

Figure 1. *Distribution of students by sex.*

Table 1. *Breakdown of students by type of home and level of study.*

Promotions	Home types	Effective	Percentage
Graduated	Feminine	62	31
	Male	67	33.50
Licence	Female?	24	12
	Male	47	23.50
Total		200	100

Among our study population 36% had a bachelor's level of study (n = 24 female and 47 male) present 65% those with a university degree of graduate (n = 62 female and 67 male).

Table 2. *Distribution of students by age group by sex.*

Ages	Sex	n (effective)	Percentage	SD
18-22	F	37	19	1.46
	M	50	25	1.19
23-27	F	38	19	1.36
	M	45	23	1.41
28-32	F	5	3	0.55
	M	22	11	1.26
33-37	F	2	1	0.71
	M	1	1	0.46
Total		200	100	7.86

The mean age of our study population was 24 years with a median of 23 years and extremes ranging from 18 to 34 years. 42% of our respondents were between 23 and 27 years old. (19% for girls, n = 38 and 23% for boys, n = 23).

Table 3. *Prevalence of overweight among students by sex and age group.*

AGES	Average BMI	Female		Average BMI	Male	
		Effective	Percentage		Effective	Percentage
18-22	00.00	00.00	00.00	32.43	1.00	0.7
	00.00	00.00	00.00	17.68	4.00	1.56
	21.01	32.00	14.87	21.94	37.00	17.95
	26.90	5.00	2.97	25.87	8.00	4.58
23-27	30.32	2.00	1.34	32.33	3.00	2.14
	17.73	3.00	1.18	17.18	1.00	0.38
	21.81	29.00	13.99	21.12	31.00	14.48
	26.76	4.00	2.37	27.09	10.00	5.99
28-32	00.00	00.00	00.00	30.30	1.00	0.67
	22.88	4.00	2.02	22.11	16.00	7.82
	25.22	1.00	0.56	26.14	5.00	2.89
33-37	17.87	1.00	0.40	00.00	00.00	00.00
	24.95	1.00	0.55	00.00	00.00	00.00
	00.00	00.00	00.00	26.56	1.00	0.59
Total	22.20	82.00	40.24	22.91	118.00	59.76

These results indicate that the prevalence of overweight is higher in boys compared to girls in all age groups. The age group most exposed to overweight in males is 23-27 years with an average BMI of 27.09%, n = 10. 2% of females aged 23-27 had a higher prevalence of overweight compared to all female age groups with an average BMI of 26.76%, n = 4. In our study, there was no shortage of data on obesity 4.87% of our respondents were moderately obese 3.51% were underweight 71.67% had normal weight in our study.

Table 4. *Distribution of average weight by sex in age group.*

Ages	Sex	Weight (kg)	Effective	Percentage
18-22	F	57.78	37.00	17.31
	M	62.86	50.00	25.45
23-27	F	60.34	38.00	18.56
	M	62.00	45.00	22.59
28-32	F	62.40	5.00	2.53
	M	66.86	22.00	11.91
33-37	F	63.50	2.00	1.03
	M	78.00	1.00	0.63
Total		61.76	200.00	100.00

We found that, the average weight across the survey students aged 18 to 34 was 61.76kg with the extremity ranging from 42kg to 93kg. Girls have an average weight of 59 kg; n = 82 (39%) and boys have an average weight of 63 kg; n = 118 (61%).

Table 5. *Distribution of average height by sex in age group.*

Ages	Female			Male		
	Size (cm)	NOT	%	Size (cm)	NOT	%
18-22	163.24	37	18.50	167.42	50	25.00
23-27	164.39	38	19.00	164.47	45	22.50
28-32	163.40	5	2.50	169.55	22	11.00
33-37	173.00	2	1.00	171.00	1	0.50
Total	164.02	82	41.00	166.72	118	59.00

% = percentage, SD = standard deviation, n = actual.

In the sample most of the students of the extreme age of 18 to 34 have an average height of 165.6 cm; SD = 9. The number of girls was n = 82 (41%) students, SD = 9.17 with an average height of 164.02cm and boys were 166.72; (n = 118; 59%).

4. Discussion

As a reminder, the study of overweight still remains of great interest in our developing countries in which its risk factors are still increasing [31]. Our study reveals a sex ratio of 1.43. For 118 subjects in our sample, the male subjects present a prevalence of overweight of 14.50%, this result is similar to that reported in Algeria [32] in a study carried out in an academic setting of which 14.01% male was overweight, this result was due to a massive participation of males compared to females in his study. On the other hand, in the work of Sautait Baguai et al. [33] in India, 33% of students were overweight, this result is explained by a large sample size compared to ours, i.e., 850 subjects. The average BMI in our study is (22.50 kg / m^2) and is comparable to that reported by Feudal N et al. [34] in Algeria (BMI 23.03), in his study, the results show an energy balance between calories consumed and only spent in students, the average weight in our study is (43.78 kg) and height (157.6 cm) this result is different from only reported by the same author (weight 48.42 kg and height 164.7 cm), This proves that the BMI increases with weight for height and height for weight.

The prevalence of overweight in our study is 20.5% respectively, Our results are similar to those reported by different researchers from developing countries: In Ethiopia, the prevalence of overweight among students aged 17 to 30 in Addis -Abeba [35] overweight was respectively 18.6% in girls and 13.9% in boys, this study shows an increase in overweight in girls than boys, which is unlike our study, in this study we found that girls were more represented compared to our study which is less represented 6%. In a study conducted in South Africa [36], 23.5% of students aged 17 to 28 were overweight, this study affirms a lived health problem for students. These results are particularly worrying since they reflect what is usually observed in adulthood for this Age Group in South Africa. This observation remains the same in our study. Sebbani M [37], had found the opposite result than ours with regard to the prevalence of overweight, 24.9% of cases in his study presented overweight. This result shows a gain in weight for height usually observed in students aged 17 to 34 (165.7cm). While Dekkeki IC [38], found the result of the prevalence of overweight inferior to our study or 9.1% according to a study made in public universities in Rabat by the same author, this study shows a slight increase in overweight.

In our study, the prevalence of overweight was higher compared to those found in several studies including that of Leung LC and al. [39], Conducted in a population of young Chinese students of 1500 subjects aged 17 to 35, had reported a prevalence of 11.2% of overweight, the author approved the importance of physical activity in the fight against this phenomenon, tan disc in a study carried out in Lithuanian among adolescents aged 18 to 29 years, Dulskiene V and al [32], had observed a prevalence of overweight and obesity of 12.1% and 2.47% respectively. This study shows a lack of physical activity compared to their culture. Baratina M and al [40], had reported a prevalence of 13% for overweight and 7% for obesity in college-aged adolescents aged 17 to 38 compared to our study, this difference between overweight and obesity could be explained by on the one hand, by the age of the students between 23 and 27 years old, the author asserts that there is an increase in body fat in girls while that of boys decreases and a lack of physical activity in children, girl's students. On the other hand, our study triggers the opposite, because the girls in university environment realize the importance of the physical activity and the control of a daily food report in spite of a low participation of female sex in our study.

5. Conclusion

This research has enabled us to take stock of overweight and the prevalence of overweight among students in university residences (Home). Overweight is real among students at the University of Lubumbashi.

In the absence of national data, our study provides an estimate of the prevalence of overweight among students in student settings at UNILU. The figures provided by the various studies encourage us to become aware of this scourge and reflect the importance of the problem. During our study, the prevalence of overweight in college students was 6.0%, n = 12 in females and 14.5%, n = 29 in males. The sex ratio was 1.43%. The prevalence in the entire student population was high or 20.5%, n = 41.

Abbreviations

SD: Standard deviation; BMI: Body Mass Index, ODK: Open Data kit, WHO: World Health Organization, GNP: Gross national product, UNAZA: National University of Zaire, UNILU: University of Lubumbashi, DRC: Democratic Republic of Congo.

Contributions from the Authors

Design of the study and tools: ANK, MFB, ST, EMS, analysis and interpretation: ANK, GK, PM, AAK, NM; manuscript: All the authors have read.

Ethical Approval and Consent to Participate

Ethics approval was obtained from all participants who provided written informed consent prior to participating.

Competing Interests

The authors declare that they have no competing interests.

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