

Prevalence of Malnutrition and Trends in Academic Settings: A Case of the National Pedagogical University of Kinshasa

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Abstract

This cross-sectional study screened 614 newly enrolled UPN students using a questionnaire and anthropometric measurements to estimate BMI-based nutritional-status prevalence. Most participants were classified within the normal BMI range, while 9.93% had BMI below 18.5 and 10.11%: (4.56%) overweight (28/614) and (5.55%) obesity (34/614) had BMI ≥ 25 “overnutrition” (62/614). The results showed statistically significant differences (p -value < 0.05) for gender among newly enrolled students. The paper concludes that both undernutrition and excess weight occur in this student population and recommends institutional nutrition initiatives.

Keywords

Prevalence, Malnutrition, Body Mass Index, National Pedagogical University

1. Introduction

Nutrition is a science of the exchanges of energy and matter between a living organism and its environment; it is also a set of processes by which organisms use food for their growth and development [1]. Malnutrition is a nutritional state that deviates from the normal nutrition described by physiologists and is the consequence of a poorly balanced diet in quality and/or quantity, with malnutrition encompassing undernutrition, overnutrition, and poor assimilation [2]. Malnutrition is a pathological condition resulting from an imbalance between the nutritional needs of the body and the intake or use of nutrients. This imbalance can be due to an insufficient, excessive, or inadequate intake of energy, proteins, or other

nutrients. There are two main forms: undernutrition, which is an insufficiency of energy and/or nutrient intake, and overnutrition, which is an excess of nutritional intake, potentially leading to overweight, obesity, and other metabolic diseases. [1] [2].

Globally, malnutrition still constitutes a major public health problem. It is not only about the lack of food: it includes malnutrition, micronutrient deficiencies, and overweight and obesity. Thus, all countries are affected, but with different forms and levels. For example, among children under 5 years old, the main forms of malnutrition are stunting, wasting, and underweight. According to the World Health Organization in 2022, 149 million children under the age of 5 suffered from stunting; 45 million suffered from wasting; 37 million were overweight or obese [3]. This growth retardation generally indicates chronic or repeated malnutrition and can compromise the child's physical and cognitive development. Emaciation, on the other hand, is often associated with recent and significant weight loss and increases the risk of complications and death. Obesity caused by overnutrition also constitutes another form of malnutrition [3] [4]. In 2022, approximately 2.5 billion adults were overweight, of which 890 million lived with obesity. This represented approximately 43% of adults worldwide for overweight and 16% for obesity. Among children, the problem is also progressing: in 2024, approximately 35 million children under the age of 5 were overweight. This situation illustrates what is called the double burden of malnutrition: the same country, the same community, or even the same household can simultaneously face undernutrition and overweight/obesity. In 2022, approximately 2.5 billion adults were overweight, of which 890 million lived with obesity. This represented approximately 43% of adults worldwide for overweight and 16% for obesity. In children, the problem is also progressing: in 2024, approximately 35 million children under the age of 5 were overweight. This situation illustrates what is called the double burden of malnutrition: a single country, community, or household can simultaneously face undernutrition and overweight/obesity. Micronutrient deficiency is another case of malnutrition that should not be overlooked, as it has been shown that deficiencies in iron, vitamin A, iodine, zinc, and other micronutrients also constitute an important component of global malnutrition. They can affect growth, learning abilities, immunity, and overall health [4]. At the level of Africa, malnutrition remains a major public health issue. It mainly manifests through malnutrition, particularly stunting and wasting, micronutrient deficiencies, but also through overweight and obesity. Recent data show that Africa remains particularly exposed to food insecurity and all forms of shortages. Sub-Saharan Africa accounts for a significant portion of children suffering from stunting. Joint estimates from UNICEF-WHO-World Bank indicate that approximately 62 million children under the age of 5 suffering from stunting live in sub-Saharan Africa. Stunting is generally the result of chronic and repeated malnutrition, often associated with poverty, inadequate diet, recurrent infections, and insufficient access to Essential Public Health Services (EPHS) [5]. Emaciation, which corresponds to acute malnutrition, remains a concern as well. It is particularly

dangerous in young children as it significantly increases their vulnerability to diseases and the risk of death. At the level of the Democratic Republic of the Congo, the situation is similar to that of low-income countries where malnutrition takes several forms, including acute malnutrition, stunting, micronutrient deficiencies, as well as overweight and obesity. The situation is particularly concerning among children under five and pregnant or breastfeeding women [4]-[6]. If we consider only the most recent data from the IPC (Integrated Food Security Phase Classification), it shows that between July 2025 and June 2026, approximately 4.18 million children aged 6 to 59 months in the DRC suffer or are likely to suffer from acute malnutrition and require prevention or treatment services. Among them, more than 1.35 million are affected by severe acute malnutrition. Furthermore, the same analysis estimates that approximately 1.54 million pregnant or breastfeeding women are likely to be affected by malnutrition and in need of care during this period [6].

In the city of Kinshasa, the capital of the D.R. Congo, the main forms of malnutrition are manifested as: stunting, an indicator of chronic malnutrition; wasting, which generally indicates acute malnutrition; underweight; micronutrient deficiencies, particularly in iron and vitamin A; as well as overweight and obesity, constituting a growing form of malnutrition [7]. In the Binza-Météo health zone, located in the western part of the city-province of Kinshasa and which constitutes our study area, available data indicate that it is organized into 11 health districts and 70 health posts. In 2024, its population was estimated to be around 586,615 inhabitants, over an area of approximately 36 km². Malnutrition has been a public health concern in this area for several years [8]. Since 2017, local data had shown a concerning situation of chronic malnutrition among children under five years old. A survey reported at the time found prevalences of 16% and 15% in certain areas of Binza Météo. This situation had led UNICEF and the NGO Magna to support community-based nutrition activities in the area [8] [9]. Based on the above situation, we thought of contributing to the fight and control of nutritional problems among newly enrolled students at the National Pedagogical University (UPN) by screening for cases of malnutrition.

2. Presentation of the Study Area

The study area is located at the corner of the Matadi Road and Liberation Road (**Figure 1**), specifically between latitude 4°24'15" South and eastern longitude 15°15'30" East and 514 m of latitude.

3. Materials and Methods

3.1. Materials

For the collection of data related to this research, we used materials such as: a ball-point pen, some duplicating paper, a laptop computer, a scale with a height measure up to 150 kg, which were useful for the creation of the survey questionnaire, a calculator, a measuring tape, and the body mass index (BMI) tables, referencing

the World Health Organization standards from 2006.

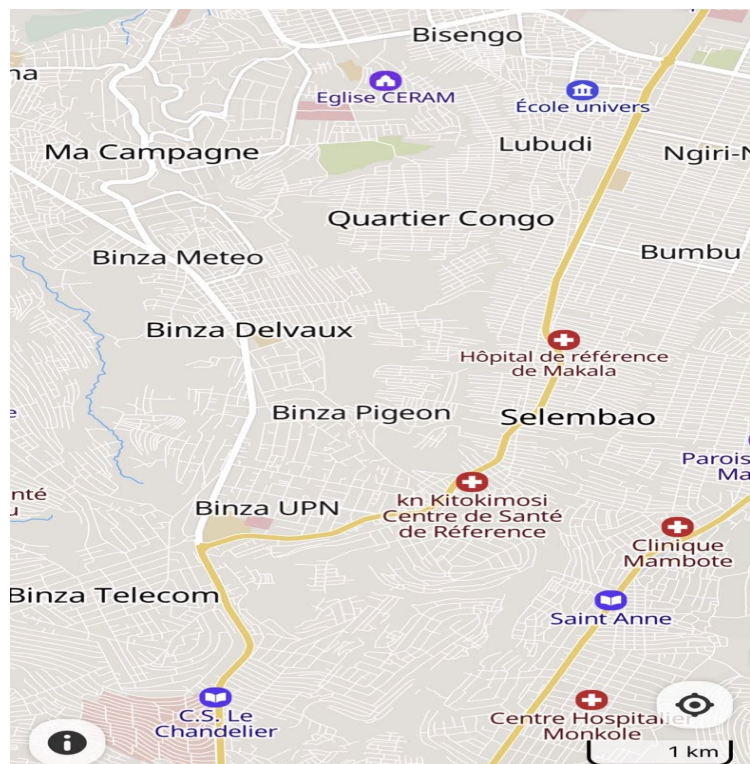


Figure 1. Overview of the Binza Pigeon health area.

3.2. Methods

During this research, which concerns the 2025 academic year newly enrolled students of the Faculty of Health Sciences, we conducted surveys among 1358 students of this faculty from 13th to 29th September 2025. These students were supposed to respond to a questionnaire of 13 questions. 614 students responded, 359 submitted unfulfilled papers and 385 remaining, refused to submit their papers. All newly enrolled students of the Faculty of Health Sciences have been concerned by this study. Furthermore, we proceeded to analyze their responses. The sample consisted of 614 students of all genders. The following parameters were measured: weight, height, and body mass index, which determines the nutritional status of the respondents. The software Microsoft Word and Excel were used, respectively, for transforming the data into tables and for the statistical analysis of the results to verify the hypotheses using the Chi-square test at 5% level of significance.

4. Results

During this study, we obtained following results. The table below shows the number of respondents by gender.

Table 1 shows that the total number of our sample was 614 first-year undergraduate students (Bachelor's, Master's, Doctorate: LMD) at the National

Pedagogical University, of which 311 were men (50.6%) and 303 were women (49.4%). The results of this table show that there are more male students than female students, which is normal because in all university institutions in the Democratic Republic of the Congo, the number of boys has always been higher than that of girls. The results of this table lead us to a sex ratio of 311/303, which is 1.026 or 1026 per 1000; this means that for every 1000 women enrolled at the National Pedagogical University, 1026 men were recorded. The distribution of respondents according to the age and gender of surveyed students is recorded in **Table 2**.

Table 1. Distribution of respondents according to the gender of the surveyed students.

Gender	Number	Percentage
Women	303	49.4%
Men	311	50.6%
Total	614	100%

Table 2. Distribution of respondents according to age and gender of surveyed students.

Age	Men		Women	
	Number	Percentage	Number	Percentage
<20 years	91	14.8%	51	8.3%
20 - 25 years	137	22.3%	135	22.0%
26 - 31 years	33	5.4%	85	13.8%
>32 years	50	8.1%	32	5.3%
Total	311	50.6%	303	49.4%

Table 3. Distribution of respondents according to the body mass index and gender.

Indicator	Undernutrition (BMI < 18.5)		Good nutritional health (18.5 ≤ BMI < 25)		Overnutrition (BMI ≥ 25)		Total
Number (n)	61		491		62		614
Gender	Men	Women	Men	Women	Men	Women	
Number	23	38	247	244	41	21	614
(%)/Gender	3.75%	6.18%	40.22%	39.74%	6.68%	3.43%	100%
(%)	9.93%		79.96%		10.11%		100%

Generally speaking, for all age groups, boys were better represented compared to girls. Moreover, the results of this table show that the age group of 20 - 25 years was the most representative. 22,3% of men and 22% of women, followed by the age group of students < 20 years, 14,8% for men and the age group of 26 - 31 years for women 13.8%. The percentages for the remaining groups are below 10%. The result obtained above is understandable because most students who normally complete the secondary level school are between 18 and 25 years old (results of our

surveys, October 2025). The following table summarizes the categorization of respondents according to the value of their body mass index, which may be outside or within the range recommended by the adult BMI classification guidance appropriate for university-age participants ($18.5 \leq \text{BMI} < 25$). The body mass index and gender of surveyed students are mentioned in **Table 3**.

The results of this table show that 79.96% of respondents, or 491/614, have a normal BMI; while 9.93% of respondents, or 61/614 students, have a BMI < 18.5 ; and 10.11% of respondents, or 62/614 students, have a BMI > 25 . In summary, out of 614 respondents, 123 students are affected by malnutrition. Regarding students with good nutritional health (79.96%), we can say that this result is consistent with the general context of food security in the city of Kinshasa, where it has been shown that 35% of households are food insecure [10]. Regarding the gender aspect, the results of this table show that in the case of malnutrition, the percentage of malnourished girls (6.18%) is higher than that of boys (3.75%). This situation is normal because at the age of puberty and/or adolescence, the hormonal activity in boys leads to increased food consumption more than in girls; this is also the case for overnutrition in boys, which is always higher than that observed in girls (6.68% compared to 3.43%).

5. Discussion

The results of this research show that out of the 614 students surveyed, 311 students were men, accounting for 50.6%, and the remaining 303 students were women, accounting for 49.4%. These results show that in our sample, there were more male students than female students among the newly enrolled students at the National Pedagogical University (UPN). In the Democratic Republic of the Congo, just like in other African countries, particularly in sub-Saharan Africa, the newly enrolled student population is dominated by males. These results are similar to those found by Elie and Baptiste in 2026, who, during their study on non-communicable diseases and cultural food transitions in South Africa and the United Kingdom, recorded more men than women among the surveyed student populations [8]. Regarding the age group, it was noted that the majority of newly enrolled students are between 20 and 25 years old, followed by those aged between 26 and 31, then those under 20 years old, and finally those over 32 years old. These results are consistent with those found by researchers Bellicha and colleagues, who conducted a study in 2025 on student nutrition, from observation to action. How can universities support the transition to a satisfactory and nutritionally high-quality diet? The number of boys (369 participants, or 75%) was three times higher than that of girls (123 participants, or 25%) [9]. Regarding the most predominant age group, students aged between 20 and 25 were predominantly represented among the surveyed students. These results are in agreement with those found by Micheline and colleagues, who in 2025 conducted a study on risky sexual behaviors and their effects on the prevalence of sexually transmitted infections among students of the Higher Institute of Medical Techniques of Goma, in which they concluded that

out of 1269 participants in this research, 896 participants, or 70.6%, were aged between 20 and 25 years. Regarding body mass index and gender, Hosseini and co-authors conducted a study in 2025 on the prevalence of severe malnutrition among cancer patients. Out of 960 surveyed, 749 participants, or 78.42% (41.31% boys versus 37.11% girls), were found to have a body mass index between 18.5 kg/m² and 25 kg/m². 116 participants, or 12.15% (8.11% boys versus 4.04% girls), were classified as overnourished or severely nourished, while the remaining 95 participants, or 9.43% (2.35% boys versus 7.08% girls) [10]. Other studies on the prevalence of malnutrition have been conducted by several authors, and these have revealed that boys are often characterized by overnutrition and girls by undernutrition [11]-[15].

6. Conclusions

This research, which was dedicated to studying the prevalence of malnutrition among newly enrolled students at the National Pedagogical University, examined the health situation of this category of students with particular attention to their nutritional health status. At the end of this research, we obtained results indicating that the majority of newly enrolled students at the National Pedagogical University enjoy a normal nutritional state, and there is not a significant gap between the proportion of students classified as overnourished and those deemed malnourished. There was a significant difference between variables, $p\text{-value} < 0.05$. Finally, men were more characterized by overnutrition compared to women, who were characterized by undernutrition.

We recommend that the Permanent Study Commission (CPE) of the Ministry of Higher Education and University, Scientific Research and Innovations collaborate with the Ministry of Public Health, Hygiene, and Social Welfare, particularly its National Human Nutrition Program (PRONANUT).

Author Contributions

- **Luc Ngandu Ngama:** Corresponding author who initiated the study that has been approved by the two laterers. He is the main author because he is the one who initiated the study, collecting data, their interpretation, discussion and draw the conclusion.
- **Christophe Nyambi Kaswala:** A specialist in statistics, he is the one who did statistical data analysis and improved the quality of this article by reading and correcting the first manuscript of this paper.
- **Alphonse Masandi Milondo:** With strong expertise in nutritional diagnostics and young nutritional status epidemiological monitoring, this author read the final manuscript of this paper, which led to the version sent to the Open Journal of Applied Sciences for assessment.

Conflicts of Interest

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

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