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Research Article

Profile of Truncal Adiposity in Young Girls and Women in the Municipality of Wangata, Mbandaka Town, Democratic Republic of Congo

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Abstract
Objective: The study on the profile of truncal adiposity among young girls and women in the municipality of Wangata, Mbandaka town, in the Democratic Republic of Congo aims to identify the attitudes and practices of young girls and women in managing truncal adiposity.
Methods: It consisted of a cross-sectional survey involving 200 of young girls and women.
Results: Truncal adiposity affects 48.9% of young girls and women in the municipality of Wangata, whose mean waist circumference is 85.65±11.33 cm. Only 37% prefer this state of adiposity, compared with 63% who prefer not to be. Efforts to manage adiposity focus on body weight monitoring (50.5%) and physical activity (33%). In contrast to these efforts, 75% of this target group eats meals often in the evening, gradually accumulating body fat and naturally disrupting their entire energy metabolism. There was a definite association between the state of truncal adiposity and the practice of physical activity to manage truncal adiposity and knowledge of general measures to prevent trunk adiposity ($p<0.05$).
Conclusion: Truncal adiposity, which is often ignored and less talked about, is a public health problem in the municipality of Wangata, in Mbandaka town that calls for effective management programs.
Keywords: Truncal Adiposity, Young Girls, Women, Management.

1. Introduction and Background

Adiposity indicates the percentage of body fat and should not be interpreted in isolation, but as part of a profile that also includes changes in body mass index (BMI), weight and height [12]. Obesity corresponds to excess body fat. It differs from overweight, which can be due to three main causes: fluid retention, increased muscle mass and, of course, excess body fat [1]. Obesity corresponds to an excessive accumulation of adipose tissue within the body, reflecting an imbalance between energy intake and energy expenditure (BMI ≥ 30.0 kg/m2) [15]. In this case, the intake of nutrients, particularly in the form of fat-rich foods, exceeds the body`s energy expenditure. There is an ever-increasing number of people suffering from diseases caused by obesity and overweight [2]. Women store most of their fat in their hips, buttocks, and thighs. Others may store most of their fat in their belly. Excess abdominal or trunk fat in women reflects a low estrogen/testosterone ratio in the presence of more fatty, sugary foods and stress, which are thought to encourage abdominal fat gain. This weight gain puts women with a waist circumference of 89 cm or more at risk of cardiovascular disease, high blood pressure and type 2 diabetes [3]. The WHO's 2008 global estimates indicate that 1.4 billion people aged 20 and over were overweight, including more than 200 million men and nearly 300 million women. Overall, more than one adult in ten worldwide was obese. The assessment of this condition is based on the determination of the body mass index [4].

Truncal adiposity, a form of obesity (android obesity), is one of the scourges ravaging humanity. It is determined by measuring waist circumference or abdominal circumference. The latter indicates abdominal adiposity if it is greater than 95 cm in a woman and 100 cm in a man [5]. According to a study published in April 2008, involving 45,000 women followed over 16 years, women with the highest waist circumference were twice as likely to die from a heart attack than women with a waist circumference of less than 70 cm [6].

Some urban areas in Africa have obesity rates approaching 30% of the adult population. According to some authors, 20-50% of urban Africans are overweight or obese. As a result of efforts to curb this trend, more and more people are now concerned about their weight. This renewed interest justifies the importance of continuing to study the problem of obesity in Africa to understand the etiology, to guide future public health strategies [7].

The demographic and health survey, conducted in 2013 in the Democratic Republic of Congo had revealed using the body mass index, a national average rate of obesity of 3.4% and overweight of 12.6% among women [8]. The issue of adiposity and obesity is receiving less and less attention at research and decision-making levels, even though in some areas the situation is very worrying. The National Health Development Plan (PNDS) 2011-2015 in its nutrition section indicated that Equateur Province is home to 15% of obese women (including young girls). This prevalence rate is above the national average of 3.4% and above the threshold of 10% usually set for a public health problem [9]. The inadequacy or lack of data on truncal adiposity among young girls and women, their attitudes and practices, and their level of knowledge about the phenomenon are issues that require attention to contribute to the analysis of the problem. The case of the municipality of Wangata, in the town of Mbandaka, was of particular interest to us.

2. Presumption and Objectives

We had assumed that the prevalence of truncal adiposity would be high and go unnoticed in these areas of Mbandaka; that young girls and women would have a negligent attitude towards the health phenomenon of truncal adiposity, would be less proactive in developing useful practices relating to truncal adiposity; and that young girls and women would be unaware of the consequences associated with truncal adiposity. To this end, the objectives were to determine the prevalence of truncal adiposity among young girls and women, the level of knowledge of the problem and the practices relating to its management.

3. Materials and Methods

This descriptive cross-sectional study was conducted in the municipality of Wangata, Mbandaka town, capital of Equateur Province, in the Democratic Republic of Congo (DRC). The statistical unit was the young girl or woman. Three-stage cluster sampling was used, with all neighborhoods included in the first stage, avenues drawn in the second stage and households of individuals drawn in the third stage. All girls and women aged between 15 and 44, with truncal adiposity, living in one of the neighborhoods of the municipality and who had voluntarily agreed to take part in the survey were included in the study.

A representative sample of 200 persons was calculated using the binomial formula: $n= z^2*p*p*k /d^2$

Where, n = the number of participants,
p = prevalence (15%),
q = Not affected probability (= 1 – p),
k (constant =1 in this case),
d= accuracy (5%).

Thus, $n= (1.96)^2 * 0.15 * 0.85 * 1/ (0.05)^2 = 195.9216 \approx 200$ in anticipation of non-response.

The studied variables were age; marital status; occupation; parity; waist circumference; adiposity-inducing factors; respondents' preferences regarding physical appearance; respondents' adiposity management practices; respondents' knowledge of general measures to prevent truncal adiposity. To measure the waist circumference, the tape was applied horizontally midway between the lowest rib margin and the iliac crest about the level of the umbilicus, at the end of gentle expiration.

The survey questionnaire was administered to individuals affected by truncal adiposity. Waist circumference was measured using a tape measure accurate to 0.1 cm. Structured interviews with the respondents were used to gather their views on the management of adiposity. The interviews were conducted between 1 and 22 September 2021 in local languages (Lingala and Mongo). The enumerators received one day's training on the methodological approach to the survey and the correct handling of the data collection instrument.

The data collected was entered, encoded, and analyzed using Excel and SPSS (Statistical Package for Social Science) version 21. Using SPPS, frequencies, means, medians, standard deviations and 95% confidence intervals were calculated, and the statistical significance threshold set at 0.05 [10]. With a 5% risk of error and a 95% confidence interval, we used the Chi-square test to examine the various relationships. This made

it possible to check for possible links between the dependent variable and the independent variables. The dependent variable is truncal adiposity. A case of truncal adiposity is defined by a waist circumference ≥90 cm. This represents an increased risk of health problems linked to abdominal obesity. The independent variables in our study are the risk factors.

Permissions from the Ward Chiefs and approval from the Wangata Health Zone Central Office were sought and obtained. Oral consent was obtained from each participant after clear explanations had been given of the objectives and purpose of the study, and of the need to respect medical confidentiality about the information collected from respondents. In addition, the anonymity of the respondents was guaranteed using codes on the survey questionnaire.

4. Results

4.1. Waist Adiposity Profile

Table 1. Waist circumference characteristics of women surveyed.

Waist circumference by age group	**Age group**	**< 90 cm**	**≥ 90 cm**
	15-19 years	20 (10%)	18 (9%)
	20-24 years	30 (15%)	29 (14.5%)
	25-29 years	33 (16.5%)	16 (8%)
	30-34 years	11 (5.5%)	17 (8.5%)
	35-39 years	14 (7%)	2 (1%)
	40-44 years	5 (2.5%)	5 (2.5%)
	Total	113 (56.5%)	87 (43.5%)
Average (cm)	**Age group**	**Average**	**C.I. (95%)**
	15-19 years	81.39±13.01	C.I.95% [77.43-85.68]
	20-24 years	86.58±12.22	C.I.95% [83.50-89.51]
	25-29 years	86.74±18.13	C.I.95% [83.84-89.95]
	30-34 years	86.40±10.21	C.I.95% [82.48-90.42]
	35-39 years	86.69±6.87	C.I.95% [83.07-89.87]
	40-44 years	88.00±8.39	C.I.95% [61.43-92.57]
	Total	85.65±11.33	C.I.95% [83.98-87.31]

The mean waist circumference was 85.65±11.33 cm and the prevalence of truncal adiposity 43.5% (waist circumference ≥90 cm) and waist circumference mode 91 cm. The rate of adiposity was highest in the 20-24 age groups, followed by the 30-34 and 25-29 age groups.

4.2. Respondents' Knowledge and Perceptions of Adiposity

Table 2. Respondents' perceptions of adiposity-inducing factors.

Age group	**Excessive consumption of caloric foods**	**Genetic predisposition**	**Inadequate exercise**	**Sedentary**	**Environmental factors**	**Consumption of advertised foods**	**Don't know**	**Total**
15-19 years	28	6	4	0	0	0	0	38
20-24 years	6	30	1	10	1	0	11	59
25-29 years	7	23	2	0	1	6	10	49
30-34 years	8	12	0	0	0	0	8	28
35-39 years	2	8	0	0	0	0	6	16
40-44 years	1	3	1	0	0	0	5	10
Total	52	82	8	10	2	6	40	200
%	26	41	4	5	1	3	20	100

According to the respondents' perceptions, the main factors leading to adiposity are a genetic predisposition and excessive consumption of calorie-dense foods.

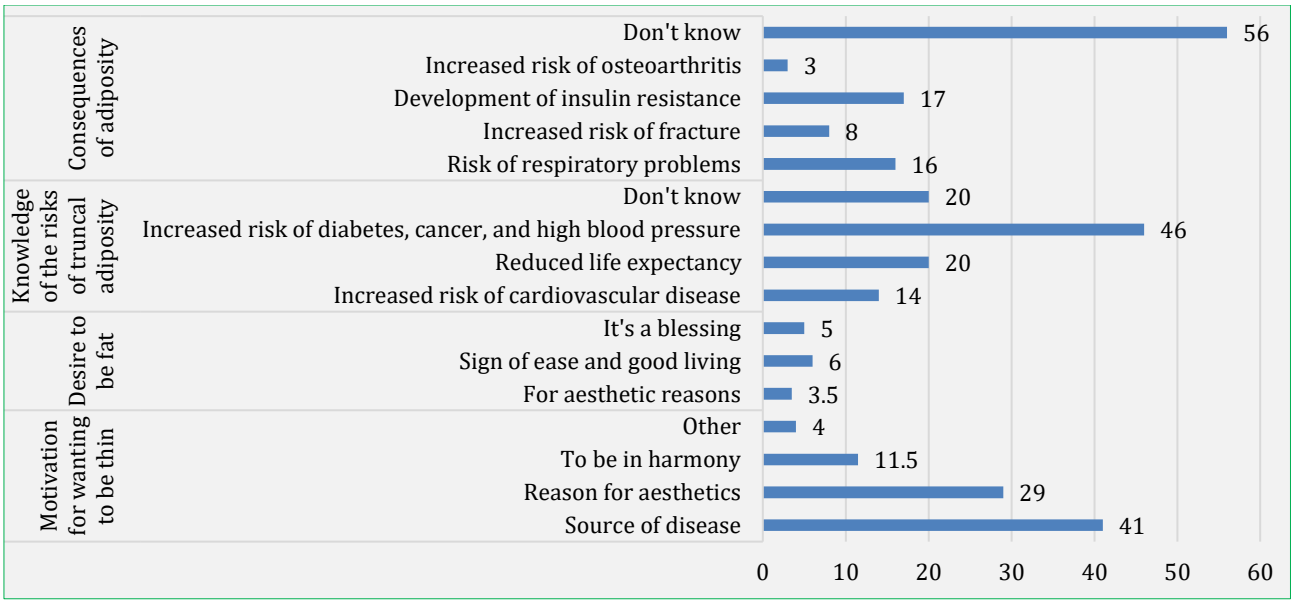

Figure 1. Respondents' perceptions and attitudes to adiposity (%).

Almost all the women surveyed were aware of at least one risk and/or consequence of truncal adiposity.

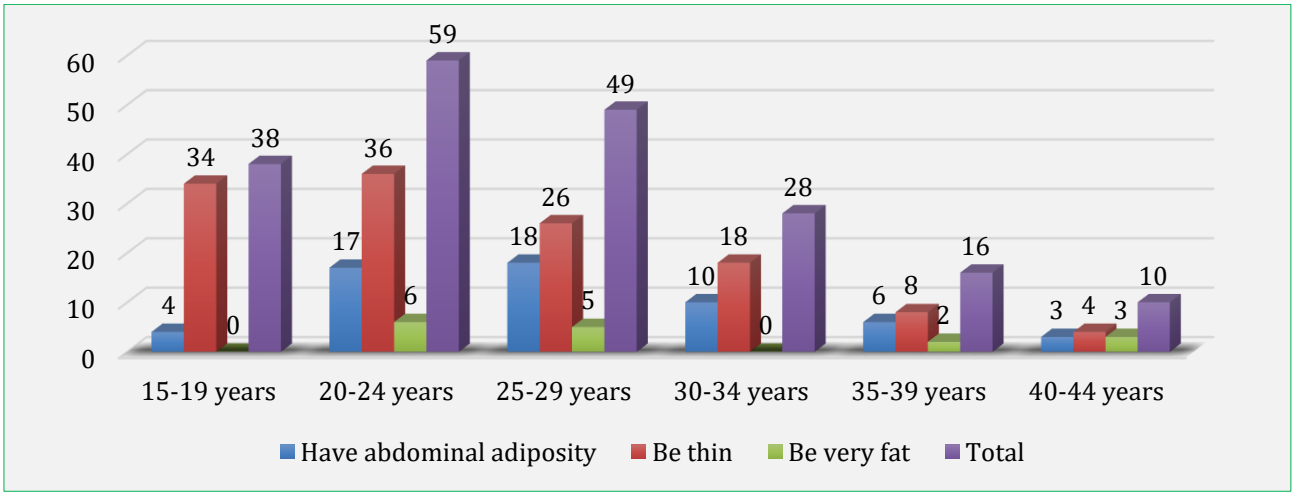

Figure 2. Respondents' preferences regarding physical appearance (N=200).

Many respondents preferred to be slim, compared with more than a quarter who expressed a wish to be overweight. This corroborates the results of figure 2 above on the wish to be fat or thin.

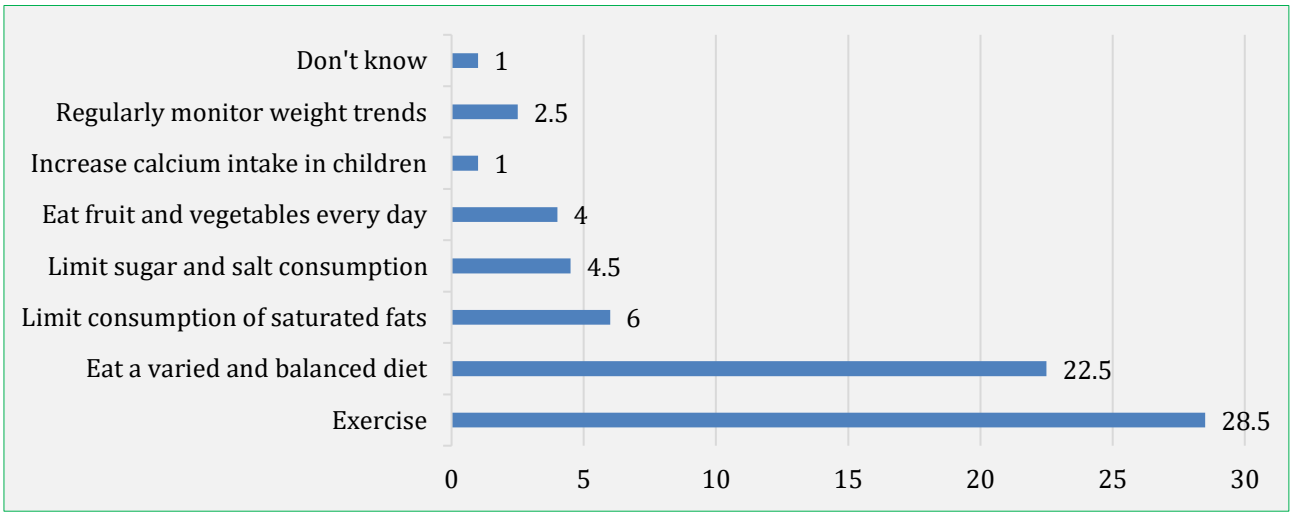

Figure 3. Measures known to prevent truncal adiposity (%) (N=200).

Three measures for preventing truncal adiposity are known: physical activity (28.5%), dietary measures (38%) and monitoring weight trends (2.5).

4.3. Practices of Respondents Relating to Adiposity

Table 3. Practices relating to adiposity management.

Practices	Useful specification	Frequency	%
Body weight monitoring		101	50.5
Approach applied to weight monitoring	By being weighed every quarter	79	39.5
	Using the clothes you wear	16	8
	By looking at yourself	5	2.5
	Other	1	0.5
Number of meals eaten per day	1 meal	20	10
	2 meals	126	63
	3 meals	50	25
	> 3 meals	4	2
Time of day meals are eaten	Evening	150	75
	Overnight	50	25
Physical activity		66	33
Type of physical activity	Walking	40	20
	Cycling	10	5
	Football	14	7
	Other	2	1
Reasons for not doing physical activity	Lack of appropriate frames	27	13.5
	No importance	38	19
	Lack of time	54	27
	Other	15	7.5

The main practices used to manage adiposity were body weight monitoring (50.5%) and physical activity (33%).

Table 4. Association between trunk adiposity status and other factors.

Factor	p-value
Monitoring body weight	0.486
Mealtimes	0.870
Physical activity to manage truncal adiposity	0.000*
Knowledge of the causal factors of truncal adiposity	0.226
Knowledge of general measures to prevent truncal adiposity	0.000*
*p-value significative (< 0.05)	

According to the ANOVA test, an association could be established, at the 5% threshold, between the state of truncal adiposity and the practice of physical activity to manage truncal adiposity and knowledge of general measures to prevent truncal adiposity.

5. Discussion

Truncal adiposity is one of the least explored areas. The study found a prevalence of truncal adiposity of 43.5%. This means that only 56.5% of the women surveyed had an ideal waist circumference and 43.5% had abdominal obesity and a high risk of developing disease. The average waist circumference in this area remains 85.65 cm±11.33 and, according to age group, the 20-24 age group has the highest rate of adiposity (14.5%) and the most worrying compared to other age groups. These results indicate a high risk of developing cardiovascular or metabolic diseases in this group [13]. The average level of waist circumference is similar to that found by Miller et al. in 2005 on a sample of 15 female volunteers who had no lipid problems to begin with [17] but remains high compared to that found by Tresaco et al. on a group of 263 Spanish teenage girls from five different geographical locations [18].

This prevalence rate of truncal adiposity is a public health problem in the area and would go unnoticed without attracting the attention of communities and decision-makers to take appropriate action. This finding corroborates that of the INSPD (public health institute of Quebec), which found that the prevalence of

abdominal obesity had doubled since 1990, rising from 21% to 48% in women and from 14% to 32% in men [11]. Except for the 15-19 age group, the average waist circumference in Wangata increases as the individual grows older, particularly from the age of 20 (86 cm) and more so at the age of 40 (88 cm). The waist circumference averages for all age groups in the sample are below 90 cm and corroborate those found by the public health institute of Quebec for the population of Quebec adults aged 18 to 34 living in private households, located at 86.7 cm, while for the other groups aged 35 to 65 and 65 to 74 they are above 92 cm. [11].

The study shows that 80% of individuals have some knowledge of truncal adiposity and its consequences. They mainly believe that a genetic predisposition and excessive consumption of calorie-dense foods are factors in inducing adiposity. On the other hand, in terms of consequences, the majority of individuals (63%) prefer to avoid this state of truncal adiposity because they believe it to be a major source of disease [13]. Three preventive measures are known by the respondents to prevent this morbid condition. These were physical activity (28.5%), dietary measures (38%) and monitoring weight trends (2.5%).

In contrast to its diseased state, very few people prefer truncal adiposity, with 3.5% preferring it for body aesthetics, 6% regarding it as a divine blessing and 5% as a sign of affluence. This requires efforts to disseminate the right knowledge through social communication to change behaviors [16]. The trunk fat management practices revealed by the study remain body weight monitoring and physical exercise. Body weight monitoring by 50.5% of respondents involved inappropriate practices such as looking in the mirror to see if they were putting on weight and/or assessing body fatness from the clothes they were wearing. The physical exercise practiced by 33% of respondents included walking (20%) and cycling (5%).

It is important to note that 75% of individuals eat in the evening as they approach a high base metabolic rate. In this case, the body cannot expend enough energy and therefore gradually accumulates body fat. A significant association, at the 5% threshold, was established between truncal adiposity and individuals who did not practice physical activity to manage truncal adiposity and who were not aware of general measures to prevent truncal adiposity. The DRC's national nutrition policy, reviewed in 2013, addresses the issue of overweight in a piecemeal fashion, and one of its specific objectives was to reduce the prevalence of overweight among women by a third. Unfortunately, however, this objective has not been followed up with clear guidelines and directives for interventions to prevent overweight at individual and community level [14].

The issue of adiposity (overweight) and obesity is not part of the nutrition activity package. The National Nutrition Programme in the DRC rarely pays attention to overweight and obesity issues. As a result, the various instruments and tools developed at national level continue to perpetuate the same deficiency. The presumption that the prevalence of truncal adiposity is high and goes unnoticed in the municipality of Wangata in Mbandaka town is confirmed, as the prevalence of 43.5% remains well above the public health threshold of 10%. Despite this high level, the Wangata Health Zone Central Office does not have information on this scale and does not include truncal adiposity among its priority health problems.

The presumption that young girls and women have a negligent attitude to this health problem and are less inclined to develop useful practices to prevent truncal adiposity was also confirmed, as only one in three people take physical exercise. The participants in the survey were less likely to be proactive in developing useful practices for managing truncal adiposity. The hypothesis that they would not have a good knowledge of the consequences of truncal adiposity could not be confirmed, given that many have perceptions of the phenomenon, are aware of the consequences and have specific perceptions of adiposity.

6. Conclusion

Women of childbearing age in the municipality of Wangata in Mbandaka town are affected by a high prevalence of truncal adiposity, an ignored health problem with multiple consequences. Empirically, it was noted that many of the individuals included in this study have notions about adiposity and express preferences related to it; in particular, 37% of them prefer this state of adiposity as opposed to 63% who do not. Faced with this awareness, practices to manage truncal adiposity have been initiated here and there and relate to body weight monitoring and physical exercise carried out by 50.5% and 33% of respondents respectively. In contrast to these efforts, 3 out of 4 people eat meals often in the evening, which does not promote a healthy metabolism or energy expenditure, and therefore leads to the gradual accumulation of body fat. Knowledge and practice of physical activity measures to manage truncal adiposity and general measures to prevent truncal adiposity are needed to help reduce this health phenomenon.

7. Recommendations

Although there is no national policy or strategy for managing obesity and overweight issues or for organizing nutrition services to deal with these problems, it is time to [14]:

- ✓ Organize advocacy on the development of intervention strategies to be implemented to combat adiposity/obesity (action by government authorities).
- ✓ Integrate into the various hospital and development structures innovative actions relating to healthy lifestyles and ongoing awareness-raising among the population of the risks associated with truncal adiposity, with a view to protecting them from the negative consequences of this condition (action by healthcare providers and development players).

Declarations

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Informed Consent Statement: Informed consent was obtained from all subjects involved in this study.

Research Content: The research content of manuscript is original and has not been published elsewhere.

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