


Coaching and Physical Activity for Overweight Children and Adolescents in Abidjan (Ivory Coast)

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Abstract

Background and Objective: Regular physical activity is hampered by excess weight, even though it is one of the pillars of its treatment. Thus, we experimented with coaching that incorporated physical activity with children and adolescents who were predominantly obese. This study was therefore undertaken to identify the benefits of this coaching on the practice of physical activities in these children and adolescents. **Methodology:** This was a prospective study conducted from December 1, 2020 to April 30, 2023, with 111 children and adolescents monitored for excess weight at the Nutrition Department of the National Institute of Public Health in Abidjan. The coaching took place in six sessions and focused on fitness and a household activity freely chosen by them. An evaluation grid was used to collect the study data. **Results:** The respondents were of both sexes with a female predominance (58.56%). Their ages ranged from 6 to 19 years, with an average age of 11.6 years. At the end of the coaching program, the proportion of people participating in fitness activities (79.28%) had increased, as had participation in household activities (86.49%). In addition, there was a 50% reduction in screen time and a normalization of weight in 5.4% of participants. **Conclusion:** These results encourage the promotion of coaching in the management of excess weight in children

and adolescents.

Keywords

Coaching, Physical Activity, Child and Adolescent, Excess Weight, Abidjan

1. Introduction

The multiple health benefits of physical or sporting activity for regular practitioners are relayed daily by the media, sports and health professionals. Indeed, it is clearly shown that regular practice of physical or sporting activity increases longevity, in the sense that it helps to reduce the risk of cardiovascular diseases, prevent osteoporosis, low back pain, chronic inflammatory rheumatism, cancers, improves the quality of sleep, reduces stress, alleviates depressive and anxiety syndromes and helps with weight control [1] [2]. As such, it is strongly recommended to include it in therapeutic protocols in the treatment of various pathologies. This is the case of excess weight in children and adolescents, which is the subject of interest in the present study. Here, excess weight is defined as a body weight that exceeds what is considered healthy for a given height. As such, it takes into account both overweight and obesity, as these are conditions in which body mass, and more specifically fat mass, exceeds established norms, which can pose health risks [3] [4]. Excess weight affects all individuals regardless of sex, age, religion, and social class.

Like any situation likely to affect human health, excess weight calls for therapeutic care to be offered to those affected. However, the observation is that very often, its therapeutic care proves ineffective, due to its multifactorial origin (biological, psychological, cultural, sociological and economic) [3]. This is why, to increase the effectiveness of this care, the recommendations in force encourage that it be multidimensional [5] [6], and include the practice of physical or sporting activities as an essential pillar.

In Ivory Coast too, excess weight in the pediatric population is a worrying reality. Although its exact prevalence is not known, it is estimated at around 10%, and is constantly increasing [7] [8] for obesity alone. And it is also the subject of an increasingly growing demand for consultation in health centers in Abidjan, the economic capital. So, based on the recommendations mentioned above, we set up a coaching program for children and adolescents who are overweight and seeking weight loss at the Nutrition Department of the National Institute of Public Health (INSP) in Abidjan. This three-part program included a nutrition component with dietary restrictions, a psychological support component, and a physical activity component. Our meetings took place on the morning of the first Saturday at the start of the main school holidays, namely Christmas, Easter, and summer vacation.

The physical activity component was twofold: The first was individual, chosen

in consultation with the parents, and involved daily practice of a sport and a household task such as washing dishes, cleaning, doing laundry, cooking, washing the car, making the bed, tidying the room, setting and clearing the dining table, doing odd jobs, watering the flowers, and taking out the trash. The aim was to get them to move their bodies and engage in physical activity.

The second was group-based and involved all study participants taking part in fitness activities during coaching sessions with the aim of increasing their motivation to engage in individual, daily sports activities. The fitness activities, which were freely chosen by all the children and adolescents at the start of the coaching program, were carried out in a fun atmosphere with the children, their parents, and the therapists. The gathering ended with a snack. A total of six fitness sessions were held during the study period.

These three fundamentals of managing excess weight in children and adolescents have already been the subject of experimentation and have noted positive effects on this target [9]. However, very few studies have been devoted to this, particularly in our context and with regard to the practice of physical activity. The present study, which focuses on this concern, aims to answer the following question:

- What influence does the coaching program implemented at the Nutrition Service of the INSP in Abidjan have on the practice of physical activity among overweight children and adolescents?
- In other words, are daily household activities and fitness during the long school holidays sufficient for these overweight children and adolescents to happily engage in regular physical activity?

This question is the basis of the present study, the objective of which is to determine the influence of the coaching program on the practice of physical activity among overweight children and adolescents.

It is based on the general hypothesis that the coaching program has a decisive influence on the regular practice of physical activity among overweight children and adolescents included in it.

Furthermore, overweight children and adolescents included in this coaching program would be more inclined to practice regular physical activity compared to their peers who are not included.

2. Methodology

2.1. Type, Duration and Scope of the Study

This was a descriptive and analytical, cohort and prospective epidemiological study, carried out from December 1, 2020 to April 30, 2023. within the Nutrition Service of the National Institute of Public Health (INSP) in Abidjan, Ivory Coast.

2.2. Presentation of the Study Sample

The study sample was selected using the purposive sampling technique. In this study, excess weight in children and adolescents, which is the focus of this study,

was defined as an entity that takes into account overweight and obesity. The study included children and/or adolescents diagnosed as overweight by a BMI-for-age greater than one standard deviation above the WHO reference growth median and obese by a BMI-for-age greater than two standard deviations above the WHO reference growth median [10] and who were able to participate in physical activity and sports based on their medical history, who were included in and regularly attended the coaching program activities, and whose parents had given their verbal consent to participate in the study.

Conversely, children and adolescents on neuroleptics, unfit to practice APS due to their medical history, who were not assiduous in the activities of the coaching program, pregnant adolescents, and those whose parents had not adhered to the study project were excluded from the study.

Based on these criteria, 136 overweight children and adolescents were preselected to participate in the study. Among these participants, some withdrew at the last minute, others moved away with their parents, or found excuses not to participate in the sessions, resulting in a final sample of 111 participants.

2.3. Data Collection Instrument

Data collection in this study was carried out using the best practice recommendations support tool “overweight and obesity in children and adolescents” proposed by the French High Authority for Health and adapted for the needs of the study [5]. The assessment was carried out over two periods. The first concerned the quarter before the start of the coaching program, and the second, just after the sixth and final coaching session. This assessment focused on individual and daily practice of a household activity, periodic fitness practice, time spent in front of screens during weekends, and nutritional status before and after the implementation of the coaching program.

2.4. Data Analysis and Interpretation

The collected data were entered with Microsoft Excel 2013 software, analyzed with SPSS version 23 software. This software also allowed the calculation of the different proportions and comparisons of frequencies between the different modalities, and processed with the Fisher test for theoretical numbers less than 5 and χ^2 for theoretical numbers greater than 5, at the significance threshold of 0.05. The effect of the program was analyzed only among those who benefited fully from the program by assessing the differences in proportion between T0 and T1. For example, the difference in weight between T0 and T1 was calculated as a percentage to identify weight loss or gain during the program period.

3. Results

The results of the study are structured around four points, namely, the presentation of the sociodemographic characteristics of the children and adolescents surveyed, the evolution of their participation in physical activities, the evaluation of

their sedentary lifestyle through the number of hours spent in front of screens and their nutritional status before and after the implementation of the coaching program.

3.1. Sociodemographic Characteristics of the Children and Adolescents Surveyed

Reading this table, the 111 children and adolescents who fully completed the program were of both sexes, with a female predominance (58.56%). Their age ranged from 6 to 19 years, with a maximum of 10 - 14 years and an average age of 11.6 years. 40.54% of them had primary level against 59.46% who were in secondary. The nutritional status was in favor of obesity in 98.20% of our respondents. Regarding their parents, 78.37% of them lived with both parents, against 21.63% who lived with either one parent or a guardian. 36.94% of the parents were public sector employees, 21.62% in the private sector, 25.22% self-employed and 16.22% without activity.

The sociodemographic characteristics of the respondents are shown in **Table 1**.

Table 1. Characteristics of the children and adolescents surveyed.

Variables	Features	Effective (n = 111)	Percentage (%)
Sex	Male	46	41.44
	Female	65	58.56
Age group	6 - 9 years old	24	17.65
	10 - 14 years old	65	47.79
	15 - 19 years old	22	34.56
	Average age	11.6 years	
Level of study	Primary	45	40.54
	Secondary	66	59.46
Marital status of parents	Parental couple	87	78.37
	Mother or father or guardian	24	21.63
Nutritional status	Obesity	109	98.20
	Overweight	02	1.80
Socio-professional category of parents	Public sector	41	36.94
	Private sector	24	21.62
	Independent	28	25.22
	No activity	18	16.22

Source: Field survey December 1, 2020-April 30, 2023.

3.2. Changes in Participation in Physical and/or Household Activity before and after the Implementation of the Coaching Program

According to this table, the number of people who did not engage in any physical

activity at the start of the program fell from 68.47% to 20.72% at the end of the program (a decrease of 47.75%), while the number of those who did engage in physical activity, which was 31.53%, had increased to 79.28% (a 47.75% increase). However, statistical analysis indicates that this difference is not significant at the probability threshold ($p > 0.05$).

With regard to household activities, the number of those who did not engage in any at the start of the program had fallen from 62.16% to 13.51% at the end of the program (a difference of 48.65%), while the number of those who did one, 37.84%, had increased to 86.49% (an increase of 48.65%).

Here, however, the calculated chi-square value of 0.000 indicates a significant difference at the probability threshold ($p < 0.05$). The program therefore had a positive effect on the practice of household activities among the children and adolescents in the study (**Table 2**).

Table 2. Distribution of respondents according to their participation in physical and/or household activity before and after the implementation of the coaching program.

Type of individual activity	Physical activity				Household activity			
	Before		After		Before		After	
Program	N	%	N	%	N	%	n	%
Effective								
No activity	76	68.47	23	20.72	69	62.16	15	13.51
With activity	35	31.53	88	79.28	42	37.84	96	86.49
Total	111	100	111	100	111	100	111	100

Source: Field survey December 1, 2020-April 30, 2023

3.3. Changes in the Sedentary Lifestyle of Respondents before and after the Implementation of the Coaching Program

Screen time before and after the program on both weekdays and weekends decreased significantly among the children and adolescents in the study. Statistical analysis also indicates a significant difference between the average screen time spent on weekdays and weekends at the beginning and end of the program among the respondents at the 0.05 probability level (p -value = 0.008 for the weekend and 0.024 for weekdays) (**Table 3**).

Table 3. Distribution of respondents according to their time spent in front of screens before and after the implementation of the coaching program

Screen time	Working days				Weekend			
	Before		After		Before		After	
Program	n	%	N	%	N	%	N	%
Effective								
From 0 to 3 hours	36	32.43	62	56.00	11	8.10	66	59.50
More than 3 hours	75	67.57	49	44.00	100	91.90	45	40.50
Total	111	100	111	100	111	100	111	100

Source: Field survey December 1, 2020-April 30, 2023.

3.4. Nutritional Status of Respondents before and after the Implementation of the Coaching Program

At the end of the program, the general nutritional status of the participants improved with a decrease in obesity of almost 29 points and weight normalization in 5.4% of the participants ($p < 0.05$) (Table 4).

Table 4. Comparison between the nutritional status of the respondents before and after the implementation of the coaching program.

Nutritional status	Coaching program			
	Before		After	
Program	N	%	N	%
Normo weight	0	0.00	6	5.4
Overweight	2	1.8	28	25.2
Obesity	109	98.2	77	69.4
Total	111	100	111	100

Source: Field survey December 1, 2020-April 30, 2023.

4. Discussion and Scope of the Study

The objective of this study was to determine the influence of the coaching program on the practice of physical activity among overweight children and adolescents in Abidjan. To do this, we successively described the sociodemographic characteristics of the 111 children and adolescents who took part in the study, described their practice of a sporting and/or household activity, assessed their sedentary lifestyle and their nutritional status before and after the implementation of our coaching program.

This study has several methodological limitations that could impact the generalizability of the results obtained. Indeed, it should be noted that the small sample size could affect statistical links at the 0.05 threshold. Furthermore, as the intervention was a three-part program, the analysis of these results did not take into account nutritional and psychological components, so it cannot be certain that the observed results, such as reduced screen time and improved weight, were not influenced by these variables.

Finally, the study period was impacted by the cancellation of some scheduled sessions due to the unavailability of most children and adolescents during the summer holidays, so the number of sessions was lower than desired. This could potentially be a limitation to consider when generalizing the results.

However, this study has the merit of presenting results that invite further exploration of the importance of coaching in the management of excess weight in children and adolescents in Abidjan.

In terms of sociodemographic characteristics, the respondents were of both sexes, with a predominance of females, aged between 6 and 19, in school, and 78.37% of them lived with both parents (Table 1).

In terms of physical and household activity, our results revealed an increase in the proportion of those who practiced regularly at the end of the coaching program, with 47.75% and 48.65% for fitness and household activity, respectively (**Table 2**).

Regarding sedentary lifestyles, the number of hours spent in front of screens had significantly decreased with a general improvement in all nutritional and anthropometric parameters (**Table 3**).

This increase in the number of fitness practitioners can be explained by the very nature of the activity and the conditions in which it took place. With background music playing, the respondents perceived fitness more as a dance or a fun activity than as exercise to stay in shape. In addition, it had been freely chosen by them and met with their total support regardless of their gender, age, and educational level. It was a collective activity that brought together subjects who shared the same health problem, and which therefore excluded hostile reactions such as mockery, rejection, or stigmatization. The location of the activity, which was the INSP (National Institute of Public Health), therefore a hospital and not a gym, also reinforced their conviction that they were in a process of care and maintained their motivation. The playful approach used increased the pleasure of carrying out this activity. However, there was no statistical correlation, probably due to the small sample size or the relatively infrequent activity sessions. Other parameters to be investigated in more detailed studies should not be overlooked.

Regarding household activities, the observed increase can also be explained by the spirit of the coaching implemented. Generally perceived as activities essentially for women or for domestic workers employed in families, or even as means of punishment used by parents in the event of misconduct, coaching helped to change the perceptions of several respondents towards them. Although less intense than sport, these activities also contributed to increased energy expenditure, the development of practical autonomy of children and adolescents and their family integration. Here too, the freedom to have chosen the desired activity constituted an opportunity to accomplish it without signs of distress. Thus, carrying out these activities had succeeded in significantly reducing the time spent in front of screens for all of them, and more so for adolescents than for children. The former, being older with a higher level of education than the latter, understood more quickly and fully the harmful effects of a sedentary lifestyle on excess weight and therefore strove to adopt healthy behaviors despite the attraction of screens. This impacted their nutritional status with weight normalization in 5.4% and a transition from obesity to overweight in 25.2% at the end of the program (**Table 4**).

These results corroborate those of many previous studies, which identify as factors of excess weight in children and adolescents, the reduction of physical activity [11]-[16], sedentary lifestyle and increased use of screens (television, digital games and computers) [17] [18].

They are similar to those of previous studies which indicate that household activities promote weight loss and improve cardiovascular health and general well-being [19], that the negative effect of a sedentary lifestyle on excess weight is greater

than the positive effect of physical activity [20]-[22] and which recommend that different programs choose physical activities that are well tolerated by overweight or obese children, particularly when they are integrated into a mixed group including their counterparts not affected by excess weight [15] [23].

The proportion of obese subjects at the start of the program, which was over 98%, fell by nearly 29 points, with a statistically significant difference at the end of the program. This difference confirms the positive effect of the program on nutritional status and demonstrates the wisdom of combining these three dimensions (physical activity, diet, and psychology), as they have often been identified as negatively impacting the care of overweight individuals. Research into the combined effect of these three dimensions will be the next research challenge.

5. Conclusions

The objective was obviously to determine the influence of this three-part program on their participation in sports and/or household activities and on their anthropometric parameters. The methodological approach used was prospective and involved 111 overweight children and adolescents monitored by the Nutrition Department of the National Institute of Public Health in Abidjan. The results obtained indicate that the respondents were of both sexes and aged between 6 and 19 years old. The coaching had increased their motivation to engage in physical activity and reduced the amount of time they spent in front of screens. Physical activity appears to be reduced by excess weight, even though it is a central pillar of its treatment. As such, the various therapeutic protocols for excess weight provide for and encourage physical activity. We therefore felt it was appropriate to focus our attention on this issue with the overweight children and adolescents included in our coaching program.

However, the lack of supervision of household activities carried out as a family and the spacing of fitness sessions, which only took place at the beginning of the main school holidays, were significant limitations of the study. These results suggest that coaching should be promoted in the management of overweight children and adolescents in Abidjan.

Conflicts of Interest

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

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