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Impact of Manual Gravel Extraction on Practitioners' Body Composition and Spirometric Values

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Abstract

The aim is to evaluate the effects of manual gravel extraction on body composition and spirometric values in divers and screeners. Our study is of an experimental and exploratory type, concerned 30 gravel workers distributed as follows: 15 divers and 15 screeners. The variables were carried out before and after four months of months of activity. The results show that the practice of manual gravelling has more significant effects in divers than in scouts on anthropometry (weight 54.42 ± 5.48 kg vs 58.62 ± 3.83 kg; Body Mass Index, 19.64 ± 1.31 kg·m^{-2} vs 20.46 ± 1.89 kg·m^{-2}), body composition (fat mass 16.70 ± 6.57 vs 20.44 ± 2.06; lean mass 40, 74 ± 5.09 vs 39.90 ± 8.87; Mineral Bone Mass 30.99 ± 7.31 vs 31.87 ± 4.87; Water Mass 4.90 ± 3.13 vs 5.44 ± 0.79) and values spirometry (Forced Respiratory Flow in 25 tiers: 2.87 ± 1.35 vs 4.36 ± 1.89). These results may explain the fact that divers have specific spots with higher intensities and volumes than in screeners. This mercantile activity requires super maximum efforts and becomes constraining. This study deserves to be continued in the years to come on the diet and energy expenditure of these practitioners.

Keywords

Body Composition, Spirometric Values, Gravel Extractors, Congo

1. Introduction

The practice of physical activity is an important health factor. This subject has been the subject of numerous research works in recent years. It is now considered an important element in health management (Bouhrour et al., 2021). Indeed, all forms of physical activity are associated with better health. In addition, it is recognized that physical activity and sedentary lifestyle are two different and independent dimensions of movement behavior, associated respectively favorably and unfavorably with the state of health (Larbaoui & Shephard, 2020).

There are several mercantile physical activities in the northern zone of Congo Brazzaville, among them the harvesting of tsam - tsam (Alongo et al., 2020) and the extraction of gravel. Today, this activity is growing considerably among young people in the Congolese basin, more precisely in the locality of Makoua. It becomes one of the means of living to meet the needs of active populations. This activity is exclusively, specifically practiced by men because it is practiced in the bed of the Likouala Mossaka river.

The manual extraction of gravel is an aquatic physical activity. It concerns two types of practitioners: divers and screeners. It is recognized that the regular practice of physical activity has positive effects on general health; however, time spent on exercise remains a major barrier for many (Moro et al., 2020). Physical activity is defined by the WHO as "any bodily movement produced by the contraction of skeletal muscle and increasing energy expenditure above resting expenditure". Physical activity has an energy cost that can be translated into quantifiable energy expenditure. In fresh water, the practice of gravel extraction is contrary to other activities, because it is not a relaxing activity but one of physical education.

Any aquatic activity provides pleasure due to the lightness of our body, mental well-being and reduced physical and joint pain (Catteau, 2008). In addition to a beneficial influence of aquatic activity on the psychic and motor development of the subjects, the practice offers them a pleasure added to a not insignificant safety. Indeed, the respiratory exploration tests are commonly used in the orientation of the diagnosis and the follow-up of the affections of the respiratory system. In extension in the monitoring and assessment of the level of cardiorespiratory fitness in trained subjects, as well as in the evaluation of patients in respiratory rehabilitation, it is increasingly recommended (Bouti & Abid, 2017).

Many factors influence the values of respiratory volumes and flows, making it difficult to standardize standards on a global scale. This is the case for age, sex, race and morphology, the latter being dependent on heredity, hormonal activity, climatological data and economic status (Pellegrino et al., 2005; Perez-Padilla et al., 2006).

However, few studies have been published on this topic. That is to say the aquatic environment and the practice of the physical activities of life. This is why we are trying to study the impact of gravel extraction on the body composition and spirometric parameters of practitioners. It is in this perspective that we pose the fundamental question in terms of problematic which can be summarized as follows: what is the impact of the manual extraction of the gravel on the values of the body composition and the spirometry of the practitioners?

To address this concern, we formulate the following hypothesis: the commercial activity of manual gravel extraction generates more effects on body composition and spirometric values in divers than in scouts.

The objective of this study is to evaluate the effects of manual gravel extraction on body composition and spirometric values in divers and screeners.

The subsidiary objectives assigned in this study were to compare the body composition variables of manual gravel extraction in divers and scouts before and after 4 months of activity and to compare the spirometric values of divers and scouts. The aim and interest of this study is to show that manual extraction allows practitioners to support themselves and reduce the poverty rate, but it leads to long-term health disadvantages.

2. Methodology

2.1. Period and Location of the Study

Our study is of an experimental type with an exploratory vision, it was carried out in Makoua in the department of the basin, during the month of August 2022, more precisely at the level of the bed of the Likouala Mossaka river.

2.2. Participants

To conduct our study, the population was made up of all the gravel extractors at the level of the bed of the Likouala mossaka at the Makoua bridge, 60 extractors including 25 divers and 35 screeners. The target population of our study was fifty gravel extractors at the level of the bed of the Likouala Mossaka in the vicinity of the bridge of National Road No. 2, distances of 10 km upstream and 5 km downstream. Taking into account the inclusion criteria, we selected a sample of 30 gravel extractors including 15 divers and 15 screeners. These inclusion criteria were based on the role and status, in particular of being a diver or a screener; practicing the activity for more than 5 years. In addition, smokers and dropouts before the end of 4 months were excluded as exclusion criteria.

2.3. Material

The equipment that we used to carry out this study consisted of: a two meter height measuring rod from the Stanley brand (Precision: 10 mm by default) to measure height; a spirometer to assess respiratory capacity before and after exercise; a stopwatch made it possible to determine the time during the daily practice phases; an impedance meter to assess body composition.

Variables Studied

- **Spirometric**

The measured variables are classified into two categories: Dependent variables (Fat mass rate, Muscle mass rate, Bone mineral mass rate, Water mass rate, FEV 1 and FEF, Independent variables (Age, height and weight).

- **Anthropometric**

Body mass index: height and weight data were used to calculate body mass index (BMI) which was the quotient of weight and the square of height in m. The body mass index makes it possible to determine and evaluate the overweight or the nutritional state of the subject.

Body Mass Index (BMI)	Interpretation
Whether BMI > 40	Very severe obesity
Whether 35.00 < BMI < 39.99	Severe obesity
Whether 30.00 < BMI < 34.99	Moderate obesity
Whether 25.00 < BMI < 29.99	Overweight (excess weight)
Whether 18.50 < BMI < 24.99	Normal
Whether 15.00 < BMI < 18.49	slight thinness
Whether BMI < 15	Severe thinness

Source: WHO, 1995.

- **Composition**

The measurement of body composition consists of determining the following variables: weight; Body fat percentage; Muscle mass ratio; Bone mineral mass rate; Body water rate

- **Experimental procedure**

Body composition and spirometry tests were carried out at the extractors concerned. They took place in the morning precisely from 6 am to 12 pm. These measurements were carried out in two essential phases before and after 4 months of practice of this activity

2.4. Statistical Analysis

Statistical analysis of the data was done using SPSS 22.0 software. It consisted of quantitative variables were expressed as the arithmetic mean accompanied by the standard deviation.

The comparison of two means for the continuous variables was carried out by the paired Student's t test to examine the effect of daily physical activity program on each parameter of interest in divers and screeners. The comparison of the means was made using the student's t test, the significance threshold was set at ($p < 0.05$) (**Table 1**).

3. Results

Anthropometric characteristics of the subjects

The analysis of this **Table 2** shows that the divers during the manual extraction of the gravel lost a percentage of their body mass and body mass index. However, the values related to weight and BMI show a highly significant difference after the daily extraction ($p < 0.001$).

This **Table 3** shows that there is no significant difference between the size and age values of the screeners before and after the effort during the manual extraction of the gravel. However, the values related to weight and BMI show a highly significant difference after the daily extraction ($p < 0.001$).

- **Subject spirometry variables**

Table 1. The various measures took into account the daily program below in the form of a summary table of the various daily tasks.

Timetables	Divers	Screeners
Spot time	10 à 15 Max second	8 à 10 Max second
Breaks	30 à 45 minute	30 à 45 minute
Volume of work	12 h/24h on average	12 h/24h on average
Without rest	6 à 7 sets with rest 10 seconds	6 à 7 sets with rest 10 seconds

Table 2. Compared anthropometric values of divers before and after daily activity in mean form and standard deviation.

Anthropometric variables	Divers (n = 15)		*p*
	Before	After	
Age (year)	26.73 ± 4.07	26.73 ± 4.07	NS
Size (m)	1.66 ± 0.09	1.66 ± 0.09	NS
Weight (Kg)	55.10 ± 5.76	54.42 ± 5.48***	<0,001
BMI (kg/m²)	19.88 ± 1.37	19.64 ± 1.31***	<0,001

Abbreviations: BMI: Body Mass Index; NS: non-significant difference, $p > 0.05$; *: significant difference, $p < 0.05$; **: very significant difference, $p < 0.01$; ***: highly significant difference, $p < 0.001$.

Table 3. The compared anthropometric values of screeners before and after daily activities in the form of mean and standard deviation.

Anthropometric variables	Screeners (n = 15)		*p*
	Before	After	
Age (year)	28.273 ± 4.04	28.273 ± 4.04	NS
Size (m)	1.69 ± 0.06	1.69 ± 0.06	NS
Weight (Kg)	58.99 ± 3.94	58.62 ± 3.83***	<0.001
BMI (kg/m²)	20.59 ± 1.92	20.46 ± 1.89***	<0.001

Abbreviations: BMI: Body Mass Index; NS: non-significant difference; $p < 0.05$: significant difference; $p < 0.01$: very significant difference; $p < 0.001$: highly significant difference.

Examination of Table 4 shows us the non-significant difference ($p > 0.05$) of the FEV 1 and FEF 25 values of the divers before and after the effort during the manual extraction of the gravel. While the value of FEF 25 - 75 shows a very significant difference ($p < 0.01$) and the only highly significant difference ($p < 0.001$) is observed at the level of FEF 25.

The results obtained from this Table 5 show that there is no significant difference between the values of FEV 1, FEF 25, FEF 25 - 75 before and after the effort of the sieves during the manual extraction of the gravel. On the other hand, we note a very significant difference ($p < 0.01$) at the level of FEF 75.

Table 4. Compared spirometric values of divers before and after daily activity in mean form and standard deviation.

Spirometric variable	Divers (n = 15)		*p*
	Before	After	
VEMS (%)	83.73 ± 10.57	83.73 ± 14.61	NS
FEF 25	4.71 ± 1.51	2.87 ± 1.35***	<0.001
FEF 75	1.91 ± 0.57	1.52 ± 0.72	NS
FEF 25 - 75	3.41 ± 0.78	2.33 ± 1.22**	<0.01

Abbreviations: FEV 1: percentage of forced expiratory volume in one second; FEF 25: Forced respiratory flow in 25 thirds; FEF 75: Forced respiratory flow in 75 thirds; FEF 25 - 75: Forced respiratory flow between 25 and 75 thirds; NS: non-significant difference; $p < 0.05$: significant difference; $p < 0.01$: very significant difference; $p < 0.001$: highly significant difference.

Table 5. Compared spirometric values of screeners before and after daily activity in mean form and standard deviation.

Spirometric variable	Screeners (n = 15)		*p*
	Before	After	
VEMS (%)	84.07 ± 12.40	83.27 ± 15.21	NS
FEF 25	4.73 ± 1.78	4.36 ± 1.89	NS
FEF 75	2.63 ± 1.30	1.99 ± 0.67**	<0.01
FEF 25 - 75	3.24 ± 0.81	3.14 ± 1.32	NS

Abbreviations: FEV 1: percentage of forced expiratory volume in one second; FE 25: Forced respiratory flow in 25 thirds; FEF 75: Forced respiratory flow in 75 thirds; FEF 25 - 75: Forced respiratory flow between 25 and 75 thirds; NS: non-significant difference; $p < 0.05$: significant difference; $p < 0.01$: very significant difference; $p < 0.001$: highly significant difference.

- **Body composition variables.**

The results obtained made it possible to show that the MG (%), MM (%), MMO (%), MH (%) of the divers before and after the effort during the manual extraction of the gravel were highly significant ($p < 0.001$) (Table 6).

This Table 7 shows a highly significant difference ($p < 0.001$) in the values of MG (%), MM (%) MMO (%), MH (%) of the sieves before and after the effort during the daily manual extraction of the gravel.

Reading this Table 8 shows that there is no significant difference between the values of Age, Height, and BMI after the daily activity of manual gravel extraction in divers and screeners. On the other hand, the only significant difference ($p < 0.05$) is observed in terms of weight.

This Table 9 shows that there is no significant difference between the values of FEV 1, FEF 75, FEF 25 - 75 after the daily activity of manual gravel extraction in divers and screeners. However, the values related to FEF 25 show a significant difference ($p < 0.05$).

Table 6. Compared body composition values of divers before and after daily activity as mean and standard deviation.

Body composition variable	Divers (n = 15)		p
	Before	After	
MG (%)	20.97 ± 9.14	16.70 ± 6.57***	<0.001
MM (%)	46.86 ± 5.43	40 .74 ± 5.09***	<0.001
MMO (%)	38.33 ± 4.95	30.99 ± 7.31***	<0.001
MH (%)	6.96 ± 4.18	4.90 ± 3.13***	<0.001

Abbreviations: BF (%): Body fat percentage; MM (%): Muscle mass rate; BMM (%): Bone mineral mass rate; MH (%): Body water content; NS: non-significant difference; $p < 0.05$: significant difference; $p < 0.01$: very significant difference; $p < 0.001$: highly significant difference.

Table 7. Comparative body composition values of screeners before and after daily activity in mean form and standard deviation.

Body composition variable	Screeners (n = 15)		p
	Before	After	
MG (%)	26.36 ± 10.67	20.44 ± 2.06***	<0.001
MM (%)	50.21 ± 8.82	39.90 ± 8.87***	<0.001
MMO (%)	40.21 ± 8.77	31.87 ± 4.87***	<0.001
MH (%)	7.58 ± 3.16	5.44 ± 0.79***	<0.001

Abbreviations: BF (%): Body fat percentage; MM (%): Muscle mass rate; BMM (%): Bone mineral mass rate; MH (%): Body water content; NS: non-significant difference; $p < 0.05$: significant difference; $p < 0.01$: very significant difference; $p < 0.001$: highly significant difference.

Table 8. Comparative anthropometric values of divers and screeners after daily activity in mean form and standard deviation.

Anthropometric variables	Divers (n = 15)	Screeners (n = 15)	p
	Before	Before	
Age (year)	26.73 ± 4.07	28.27 ± 4.04	NS
Size (m)	1.66 ± 0.09	1.69 ± 0.06	NS
Weight (Kg)	54.42 ± 5.48	58.62±3.83*	<0.05
BMI (kg/m²)	19.64 ± 1.13	20.46±1.89	NS

Abbreviations: BMI: Body Mass Index NS: difference not significant; $p < 0.05$: significant difference; $p < 0.01$: very significant difference; $p < 0.001$: highly significant difference.

The results obtained from this Table 10 show that there is no significant difference in the values of MG (%), MM (%), MMO (%), MH (%) after daily activity in divers and screeners. However, we note a highly significant difference ($p < 0.001$) after exercise at the level of MG (%).

Table 9. Compared spirometric values of divers and screeners after daily activity in mean form and standard deviation.

Spirometric variable	Divers (n = 15)	Screeners (n = 15)	*p*
	After	After	
VEMS (%)	83.73 ± 14.61	83.27 ± 15.21	NS
FEF 25	2.87 ± 1.35	4.36 ± 1.89*	<0.05
FEF 75	1.52 ± 0.72	1.99 ± 0.67	NS
FEF 25 - 75	2.33 ± 1.22	3.14 ± 1.32	NS

Abbreviations: FEV 1: percentage of forced expiratory volume in one second; FEF 25: Forced respiratory flow in 25 thirds; FEF 75: Forced respiratory flow in 75 thirds; FEF 25 - 75: Forced respiratory flow between 25 and 75 thirds; NS: non-significant difference; $p < 0.05$: significant difference; $p < 0.01$: very significant difference; $p < 0.001$: highly significant difference.

Table 10. Compared body composition values of divers and screeners after daily activity as mean and standard deviation.

Body composition variable	Divers (n = 15)	Screeners (n = 15)	*p*
	After	After	
MG (%)	16.70 ± 6.57	20.44 ± 2.06**	<0.01
MM (%)	40 .74 ± 5.09	39.90 ± 8.87	NS
MMO (%)	30.99 ± 7.31	31.87 ± 4.87	NS
MH (%)	4.90 ± 3.13	5.44 ± 0.79	NS

Abbreviations: BF (%): Body fat percentage; MM (%): Muscle mass rate; BMM (%): Bone mineral mass rate; MH (%): Body water content; NS: non-significant difference; $p < 0.05$: significant difference; $p < 0.01$: very significant difference; $p < 0.001$: highly significant difference.

4. Discussion

1) The hypothesis of our study

Is manual gravel extraction generating more effects on body composition and spirometric values in divers than in screeners. This hypothesis is justified through different tables. We deduce that these differences are dependent on the different tasks and specific roles of the extractors including divers and screeners. It is verified in relation to that which has just been said.

2) Anthropometry of practitioners

The manual extraction of gravel being a physical activity, its practice is determined by several factors including the anthropometric characteristics related to morphology.

The results of Table 2, Table 3 and Table 8 of our study show that divers and screeners present different values from a statistical point of view concerning age and size (26.73 ± 4.07 years vs 28.273 ± 4.04 years; 1.66 ± 0.09 years vs. 1.69 ± 0.06 years). As well as weight and BMI (55.10 ± 5.76 kg vs 58.99 ± 3.94 kg; 19.88

± 1.37 kg·m^{-2} vs 20.74 ± 2.01 kg·m^{2}) weight (54. 42 ± 5.48 kg vs. 58.62 ± 3.83 kg); BMI (19.64 ± 1.31 kg·m^{-2} vs 20.46 ± 1.89 kg·m^{-2}) after exercise (**Table 8**). This can be justified by the volume and the very high work intensity of the divers compared to the controllers (**Table 1**). Indeed, during the practice of the manual extraction of the gravel the divers go in apnea under water, collect in a container of the gravel, go up and return in the sieves held by the sieves. Indeed, these two brief tasks and at frequencies high therefore allow a higher energy expenditure compared to sieves whose essential task is to rinse gravel through a sieve. On the other hand, the average values respectively concerning height (1.66 ± 0.09 vs 1.69 ± 0.06) and age (26.73 ± 4.07 vs 28.273 ± 4.04) (**Table 8**) were practically identical this is justified by the fact that the random choice of our sampling. However, the BMI values of these subjects make it possible to classify them among those with a normal nutritional status according to the WHO classification reported by Ewamela et al. (2006). It appears from these tables a highly significant difference ($p < 0.001$) in the values of the body mass index of the divers and the screeners during the extraction of gravel.

This increase from the statistical point of view of the values of the body mass index greater in the screeners and then in the divers (19.64 ± 1.31 kg·m^{-2} vs 20.46 ± 1.89 kg·m^{-2}) after exercise (**Table 8**).

These results are in agreement with those of Macouba Faye in 2012, which show that physical activity has positive effects on the person, especially when it is exercised regularly with a lot of commitment. We observed a difference in body mass index between divers and screeners. This difference could be explained by the fact that divers have very intense activity in terms of volume and intensity, which burns fat while expending energy.

These results are related to that of Kananga Muamba in 2018. Indeed, the same authors in 2018, reported that anthropometric data influence the spirometric values of an individual, in the sense that the contribution of body mass indices is increasingly considered, especially in establishing reference equations for a given population.

3) Practitioners' body composition values

The body composition values of manual gravel extraction from divers and screeners before and after exercise show a highly significant difference ($p < 0.001$) in favor of divers. With regard to fat mass, a significant increase was noted before the effort. However, a significant drop was observed after the effort, in particular 20.97 ± 9.14 vs 16.70 ± 2.06 in the divers versus 26.36 ± 10.67 vs 20.44 ± 2.06 for screeners; for muscle mass rate (%): 46.86 ± 5.43 vs 40.74 ± 5.09 vs 50.21 ± 8.82 vs 39.90 ± 8.87; for the bone mineral mass rate (%): 38.33 ± 4.95 vs 30.99 ± 7.31 versus 40.21 ± 8.77 vs 31.87 ± 4.87 and then the water mass rate (%): 6.96 ± 4.18 vs 4.90 ± 3.13 against 7.58 ± 3.16 vs 5.44 ± 0.79 **Table 6**, **Table 7** and **Table 10**.

These results can be explained by the daily practice of manual gravel activity, by a very high frequency, volume and intensity of the work carried out. Indeed, manual extractors have a daily working time of around 13 to 14 hours on average with short break times for eating and drinking. These data are in agreement with the data of Kananga et al. 2018, who report that there is a close relationship between body composition and spirometric values in a population. This difference in results is associated with a determining factor, which is age. Indeed, our series differs from this one because, Muamba et al., 2018, worked with adult subjects aged 20 to 70. The results in **Table 10** show us that the values of the body composition of screeners are higher than among divers. This is due to the fact that the intense practice of physical activity very important among divers. Indeed, the diver's quotient spots are centered on two apnea phases characterized by diving and taking gravel and the other non-apnea phase consisting of floating and traversing the gravel in the sieve. On this subject, it is appropriate to say that short times in series of six with reduced phases of breaks.

The fat mass rate in the present study was positively correlated with the increase in FEV 1 and FEF as a function of the intensity of the activity. These data are in agreement with those of other authors. Indeed, lean mass, represented in particular by muscles, exerts a strengthening action on respiratory muscles, as described by Santana et al on a group of elderly subjects (Santana et al., 2001).

This observation suggests that the preponderance of abdominal visceral fat over subcutaneous adipose tissue, in the impact on respiratory volumes; but also, the different distribution of abdominal fat between divers and screeners is very less

4) Respiratory values

The analysis of the **Table 4** and **Table 5** shows that the rate of forced expiratory volume per second (FEV 1), reveals a highly significant difference ($p < 0.001$) of the values of the extraction of the gravel of the divers and the screeners before and after effort. This capacity represents the total volume of air that can be mobilized during a forced respiratory cycle. The joint effect of the increased inspiratory and expiratory volumes is responsible for a highly significant improvement in the rate of the maximum expiratory volume per second. Then the statistical analysis of the results of tables 9 makes it possible to highlight the reduction of certain respiratory parameter in the divers and the screeners after the effort. At the end of the comparison, these results show us that the spirometric values (Forced respiratory flow in 25 thirds; Forced respiratory flow in 75 thirds; FEF 25 - 75: Forced respiratory flow between 25 and 75 thirds) of screeners are higher than in divers. With regard to forced respiratory flow in 25 thirds: 4.36 ± 1.89 vs 2.87 ± 1.35; for FEF 75: Forced respiratory flow in 75 thirds: 1.99 ± 0.67 vs 1.52 ± 0.72 and then Forced respiratory flow in 75 thirds; FEF 25 - 75: 3.14 ± 1.32 vs 2.33 ± 1.22. This is explained by the fatigue, due to the effective intensity of the manual activity of the extraction of the gravel after the effort. These data corroborate that of Jean Cocteau in 2013 who notes that the fatigue installed following activities after exercise can influence respiratory parameters. Forced vital capacity, as its name suggests, requires a significant muscular effort to allow the mobilization of the largest possible volume of air. The fatigue installed following the activities can therefore explain the decrease in these values. The second reason relates to the muscular effort required to acquire this measurement. Our study has different values to those of other authors. In the case of forced expiration, there is sometimes a partial collapse of the tracheobronchial tree, when the pleural pressure becomes greater than the pressure within this tree. We then witness the phenomenon of air tramping which consists of the retention of a volume of air within the lung (65 - 93). Flue forced expiration measurement is therefore diminished. The different morphology of the lungs and their size, the caliber of the airways, and the diffusion surface are plausible explanations; as well as the action of estrogen and progesterone on ventilation and other respiratory functions mentioned by some authors (Harms, 2006). They found in this group, an inverse relationship between increased abdominal circumference, with a consequent increase in the FEV 1/FVC ratio.

The results obtained during this study show that the activities of the manual extraction of the gravel of the divers on all the parameters studied are subjected to an extreme physical effort compared to the sieves. Physical activity is an excellent way to increase daily energy expenditure and therefore contributes to maintaining a stable weight. According to some studies, physical activity can be effective in reducing cardio metabolic risk. Indeed, Andersen et al. (2006) demonstrated that physical fitness and low cardiorespiratory capacity were independently associated with risk factors for cardiovascular disease in adolescents aged 9 - 15 years. Another study observed the effects of aerobic interval training lasting 3 months compared to a multidisciplinary approach (physical activity, nutrition and behavioral approach) lasting 12 months on disease risk factors cardiovascular disease of 54 overweight and obese adolescents. Today, the many studies in this field agree to show that a regular and moderate practice of physical activity has a positive effect on health, physical condition and improves the quality of life. Inactivity, according to the European Heart Network report, is the major factor in the development of cardiovascular and cerebral diseases. Cardiovascular disease is now the second leading cause of death in the world. They become the leading cause of death from the age of 65. Physical activity, for its part, has a decisive action in the prevention and treatment of recent deaths (Fervers et al., 2019).

Physical activity is now recommended in the field of cardiovascular diseases, both to prevent their occurrence and to limit their consequences when they occur. Many studies have shown that physical training reduces cardiac morbidity and mortality by acting on risk factors such as lipid profile, blood pressure, coagulation and the physiology of the vessel wall (endothelium). Physical activity has an overall protective effect on certain cancers. Physical activity allows you to solicit this muscle and makes it progress. The more developed the heart muscle, the more blood it sends with each beat. As a result, it beats less quickly at rest. It saves itself and tolerates effort better. Health-related quality of life is therefore articulated around three main dimensions: the physical or physiological dimension, the mental or psychological dimension and the social and environmental dimension. The regular practice of physical activities contributes to the quality of life by acting on these various factors: satisfaction with the body, reduction in the level of stress, positive affective experiences through integration into the group or positive regard from the other, participation active in social life.

5. Limits of Our Study

Some limitations should be noted in our study. The first is that respiratory function did not include static volume measurements, including total lung capacity and expiratory reserve volume. Second, body composition indices also needed to be accompanied by aquatic-related heart rate measurements because practitioners were working in water. Our results are consistent with several studies. This suggests that these methodological concerns do not affect the results.

6. Conclusion

The present study was carried out with the aim of evaluating the physical exercise based on the manual extraction of gravel in divers and screeners through anthropometric measurements; body composition indices and spirometric measurements. This study hypothesized that the mercantile activity of manual gravel extraction generates more effects on body composition and spirometric values in divers than in screeners. These results have shown that manual gravel extraction in practitioners presents more significant adaptations on anthropometric, body composition and spirometric values in favor of divers than screeners. In view of the above, our study hypothesis has been verified. This activity is practiced by a juvenile layer. It requires a lot of effort. Indeed, it becomes similar to a physical activity at very high volume of its regular practice, which allows the extractors to meet the needs but can be an evil in the intensive practice. Manual extraction of gravel among practitioners deserves to be continued in the years to come associated with the diet in relation to the energy expenditure of these practitioners.

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Conflicts of Interest

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

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