## RESEARCH ARTICLE

# THE FUNCTIONAL STATUS AND PHYSICAL CONDITION OF SENIORS IN A CATHOLIC INSTITUTION IN BRAZZAVILLE

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### ARTICLE INFO

### ABSTRACT

**Objectives:** This article was produced with the dual aim of determining the functional status and evaluating the physical condition of seniors (PCS), the Little Sister of the Poor House (LSPH). **Methods:** the study focused on pepeole of both sexes combined residing in the Little Sister of the Poor House and having signed the informed consent form, namely 21 men and 33 women, or a total 54 subjects for the first part of our study. They were all submitted, (to the senior's fitness test developed by Rikli andal, 2001)[1]as part of this study, the statistical processing of the data was carried out using SPSS version 22software (IBM, United states). For the calculation of the maximums, minimums averages and standard deviations we have opted for descriptive statistics. Regarding the comparison of means, after checking for homogeneity and normality, non-parametric statistical tests were retained. However, multiple comparisons between different age groups were made using the Kruskal Wallis test. [2]. Results: It emerges from this work that the subjects of this age group presented the minimum values of 150cm and the maximum value of 167cm with regard to size with an average of $150.50 \pm 8.75$ cm. As for the weight of the subjects of this age group, the minimum value presented is 49kg and the maximum value is 58kg i.e. $51.75 \pm 4.19$kg their body mass index was 18kg.m-2 while the maximum value of this data was 22.22kg.m-2 for an average of $21.50 \pm 0.72$ kg.m-2. It should be noted that the values of the series were homogeneous insofar as they are around the mean with CV <10%.CONCLUSION. This study made it possible to determine the functional status and assess the physical condition of the seniors. The results obtained showed that there is no autonomous man among the residents of the Little Sister of the Poor House (LSPH). In sum, these results indicate that no significant difference appeared between the sizes of subjects of different age groups. However, the weight and BMI IMCof independent seniors in the 70-74 age group were significantly higher compared to their colleagues in other age groups.

## INTRODUCTION

Context and justification Aging constitutes the set of slow, progressive and irreversible physiological and psychological processes which modify the structure and functions of the body from middle age (Bourdelais, 1997) [3]. It is linked to heredity and the environment. Kirkwood et al. (2000) [4] conceived it as a process whose external or internal manifestations result in the decline in performance over time and in the loss of biological functions leading to the death of the organism.Due to the significant increase in life expectancy around the world, the elderly population is on the rise. In 2010 it was estimated at 43 million individuals and should reach 67 million individuals by 2025 and 163 million by 2050 in the world (WHO, 2010) [5].

These resolutions are not the subject of any popularization or application in the Republic of Congo.Indeed, no care policy for the elderly in institutions or outside institutions has been considered and condemns them to a sedentary lifestyle. This is noticeable through the lack of data on the lifestyle, physical form, and level of motor skills of Congolese seniors. This concern interests both the medical profession and that responsible for managing and maintaining the human motor skills of seniors.

## MATERIALS AND METHODS

**Period and field of investigation:** The study took place from September 20, 2018 to November 23, 2018 with the elderly of the retirement home called Little Sister of the Poor located next to the Sacred heart Cathedral in Brazzaville**.**

**Population:** The population of this study consisted of all people of both sexes combined residing in the the Little Sister of the Poor House (LSPH**)** and having signed the informed consent form, i.e. 22 men and 35 women, made it possible to identify 21 men and 33 ladies, i.e. a total of 54 subjects for the first part of our study. There were two types of criteria used to select this sample: inclusion criteria and exclusion criteria.

**Inclusion criteria**

- be aged 60 and over;
- reside in the Little Sister House of the Poor permanently and continuously for at least a year;
- have signed the informed consent form;
- have participated in the interview relating to the assessment of autonomy

**Exclusion criteria**

- be miss at the time of our study.
- not signing the informed consent form.

For the second phase of this study, another non-probability sample of 16 women was selected according to the inclusion and exclusion criteria.

**Inclusion criteria**

- have no handicap for the practice of a physical activity;
- have no functional limitations;
- have taken part in physical aptitude assessment tests.

**Exclusion criteria:**
-present contraindications to the practice of a physical activity.

**Data collection techniques**

The study consisted of two parts, namely:

- determination of the functional status of resident subjects;
- assessment of the physical condition of subjects declared independent at the end of the first part.

**Assessment of physical condition:** The measurement of anthropometric variables (size and weight to determine the body mass index) and physical aptitude tests in particular (the senior fitness tests developed by Rikli et al., 2001 [6]) have of our subjects.

**Anthropometric measurements:** The anthropometric variables evaluated were that of weight and height. Anthropometric measurements (height, weight) were carried out and recorded using the technique recommended by the KINO-QUEBEC Committee on the physical activity evaluation file (2002) [7].

**Statistical processing of data:** In the framework of this study, the statistical processing of the data was carried out using SPSS version 22 software (IBM, United States). For the calculation of the maximums, minimums, averages and standard deviations we have opted for descriptive statistics. Regarding the comparison of means, after checking for homogeneity and normality, non-parametric statistical tests were retained. However, multiple comparisons between different age groups were made using the Kruskal Wallis test.

# RESULTS

**Presentation and analysis of results:** In order to determine the functional status and assess the physical condition of the elderly in the the Little Sister of the Poor House, it was useful to present: the functional status of these seniors, their anthropometric characteristics and their physical condition. Figure 1 shows the distribution by age group and function of functional status of residents of the the Little Sister of the Poor House.
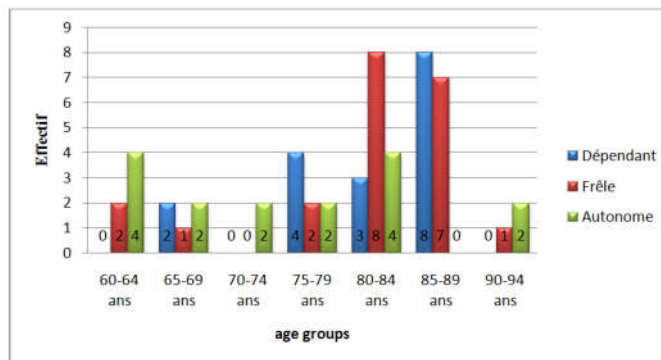


effectif =members ans = years frele =frail autonome= autonomous dependant= Dependent

**Figure 1. Overall trend in the functional status of seniors at the Little Sister of the Poor House**

Autonomous elderly people were much more enumerated in the 60-64 age groups, and 80-84 years, and little identified in the other age groups (65-69 years, 70-74 years, 75-79 years and 90-94 years). Dependent women were not registered in the 60-64 age group. On the other hand, they were less numerous between 65-69 years old, a few between 80-84 years old, more numerous between 75-79 years old and much more numerous between 85-89 years old. They have also not been observed between 90-94 years. Most of the frail children were in the 80-84 age group, followed by 85-89, 60-64 / 75-79 and 65-69 years / 90-94 years.
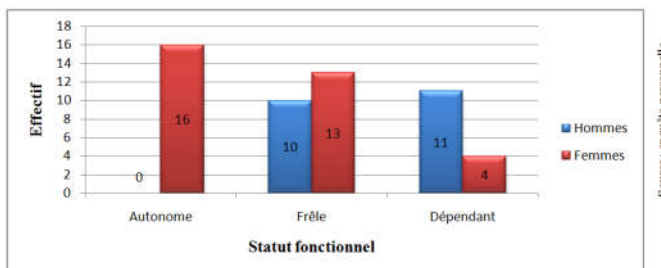


statut foctionnel =Functional status hommes= men     femmes= women source d enquete personnelle =personal survey source

**Figure 2. Illustrates the influence of gender on the functional status of the elderly at the Little Sister of the Poor House**

Figure 2 has shown that there is no autonomous man in the Little Sister House of the Poor. However, among women, 16 were declared independent. In addition, women in a state of fragility were more numerous than men in the Maison Petite Sœur des Pauvres, at a rate of 13 women against 10 men. Conversely, men in a situation of dependency were more numerous than men. their female counterparts (nearly three times that of women) with respective values of 11 and 4. Figure 3. Represents the number of autonomous, frail and dependent subjects of the It emerges from the analysis of this figure that the subjects in a state of fragility were the most numerous, that is to say a total of 23.

**Anthropometric characteristics:** Subjects in this age group presented the minimum value of 150cm and the maximum value 167cm for size with an average of 158.50 ± 8.74 cm. As for the weight of subjects in this age group, the minimum value presented is 49 kg and the maximum value is 58 kg, ie 51.75 ± 4.19 kg.Their minimum body mass index was 18 Kg.m-2 while the maximum value of this data was 22.22Kg.m-2 for an average of 21.55 ± 0.72 Kg.m-2. It should be noted that the values of the series were homogeneous insofar as they are around the mean with CVs <10%. Table 2: Shows the age, height, weight and body mass index (IMC) of independent female subjects as the mean and standard deviation (m ± □).

compared to their colleagues in other age groups in terms of weight and IMC (p <0.05).

**Physical condition:** The results of various physical aptitude tests (Rikli et al., 2001) [8], namely seated flexibility, back scratches, arm bends, sit-stand, back and forth and the 6-minute walk are presented in the tables below according to the age group of the subjects. Reading Table 3: reveals that seniors in the 60-64 age group performed better on the flexibility and back scratch tests compared to their counterparts in other age groups (p <0 , 05). Likewise, the number of arm flexions was significantly higher among seniors in the 60-64 age group compared to their colleagues in
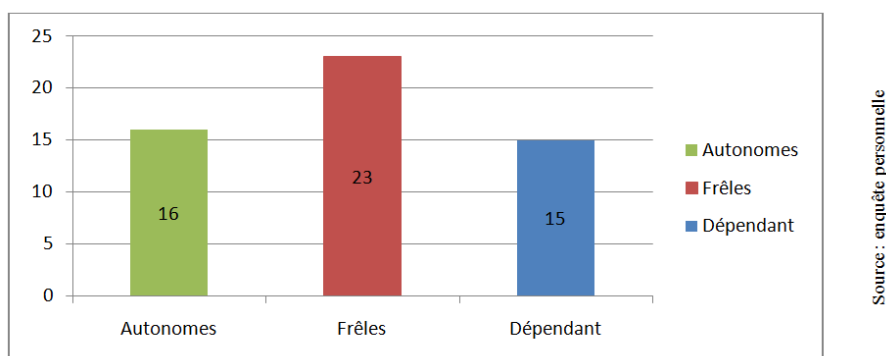


**Figure 3: Evolution of the functional status of the seniors of the Little Sister of the Poor House**

**Table 1. Minimum, maximum, mean associated with the standard deviation and the coefficient of variation of the age, height, weight and IMC of subjects in the 60-64 years age group**

|  | size (cm) | weight (Kg) | IMC (Kg.m$^{-2}$) |
|---|---|---|---|
| Min | 150 | 49 | 18.00 |
| Max | 167 | 58 | 22.22 |
| $\overline{x}$ | 158.50 | 51.75 | 21.55 |
| δ | 8.74 | 4.19 | 0.72 |
| CV | 5.51 | 8.10 | 3.33 |

**Table 2. Size, weight and IMC of independent seniors of the different age groups of the Little Sister of the Poor House**

|  | 60-64 ans (n=4) | 65-69 ans (n=2) | 70-74 ans (n=2) | 75-79 ans (n=2) | 80-84 ans (n=4) | 90-94 ans (n=2) | □$^2$ | P |
|---|---|---|---|---|---|---|---|---|
| Taille (cm) | 158.5±8.74 | 152.00±2.83 | 143.50±2.12 | 149.50±3.54 | 154.25±2.50 | 152.00±4.24 | 07.28 | 0/20 |
| Poids (Kg) | 51.75±4.19 | 47.50±3.54 | 82.00±0,00* | 52.00±2.83 | 53.00±2,16 | 38.5±0.71 | 11.09 | 0.049 |
| IMC (Kg.m$^{-2}$) | 21.55±0.72 | 20.54±0.77 | 39.59±0.83* | 23.6±0.17 | 22.27±0.37 | 17.03±1.13 | 13.22 | 0.021 |

\* : Différence significative
P : kruskalwallis

ans= years, Taille= Size, weight=poids, IMC=  differnce significative; * : significant difference

**Table 3. Motor performance of the seniors of the different age groups of the Little Sister of the Poor House**

|  | 60-64 ans (n=4) | 65-69 ans (n=2) | 70-74 ans (n=2) | 75-79 ans (n=2) | 80-84 ans (n=4) | 90-94 ans (n=2) | χ$^2$ | Ddl | p |
|---|---|---|---|---|---|---|---|---|---|
| Sitting flexibility | -3.06±0.13* | -4.00±0.00 | -4.5±0.00 | -5.00±0.00 | -5.50±0.41 | -6.50±0..35 | 14.434 | 5 | 0.013 |
| Back scraper | -11.75±0..29* | -13.00±0.71 | -14.00±1.41 | -15.00±1.41 | -17.00±0.82 | -21.00±0.00 | 14.119 | 5 | 0.015 |
| Arm flexions | 12.50±0.8* | 11.75±0.35 | 11.5±0.71 | 11.50±0.71 | 9.50±0.58 | 07.5±0.71 | 13.102 | 5 | 0.022 |
|  | 11.50±0.58* | 9.50±0.71 | 07.5±0, 1 | 7.00±0.00 | 5.5±0.58 | 3.00±0.00 | 14.531 | 5 | 0.013 |
| Round trip 6 min walk | 11.63±0.77* | 12.77±0.35 | 13.22±0.04 | 13.5±0.01 | 14.73±0.98 | 15.39±0.58 | 13.995 | 5 | 0.016 |
|  | 327.25±6.91* | 271.46±4.01 | 99.44±0.00 | 92.63±0.53 | 91.59±0.29 | 85.83±0.42 | 14.599 | 5 | 0.012 |

P : Kruskal Wallis
* :  significant difference

The results of table 2: indicate that no significant difference appeared between the size of the subjects of the different age groups; however, the autonomous seniors of the age group of 70-74 years presented values significantly more high

other age groups (p <0.05). In addition, seniors in the 60-64 age group also exhibited significantly greater values than those recorded by their colleagues in other age groups during the sit-stand, round-trip and 6-minute tests. walking (p <0.05).

# DISCUSSION

The objectives of this study were to determine the functional status and then to assess the physical condition of the seniors of the Little Sister of the Poor House

**Following the subjects' inactive and sedentary lifestyle, we formulated the following hypotheses:** independent seniors cared for in thelittle sister of the poor house are less numerous than the frail; the seniors cared for in the Little Sister of the Poor House are said to be in less physical condition. To verify these hypotheses, we used a cross-sectional study using an interview based on the ADL scale of Katz (1963) [9] and a battery of tests (Rikli and Jones, 2001). upstarts are therefore of considerable interest. Aging is a function of age and gradually induces the loss of physical potential. Indeed, several measures of loss of autonomy and disabilities have shown that people aged 60 or over, 26% report at least one functional limitation (physical, sensory or cognitive); 12% have difficulty washing and 28% say they receive human assistance (Brunel and Carrière, 2017) [10]. These results corroborate those of Tholomier (2014) [11] who reported a greater proportion of young and old little dependent.

Their lower dependence translates into the ability to perform activities of daily living. Zimmermann-Sloutskis et al. (2012) [12] found that autonomous people would be able, if necessary, to make purchases (61%), use public transport (49%) or prepare their meals (45%). These authors added that these people therefore have good mobility since nearly 80% of them can walk a short distance without assistance. Brunel and Carrière (op. Cit.) [13] These results show that there is no significant difference between the sizes of seniors in different age groups. However, this difference is not negligible. In fact, the size of subjects in the 60-64 age group is significantly larger followed by those of 80-84 years, 65-69 years / 90-94 years, 75-79 years and finally 70 -74 years (158.5 ± 8.74 cm Vs 154.25 ± 2.50 cm, 152.00 ± 2.83 cm, 152.00 ± 4.24 cm, 149.50 ± 3.54 cm and 143 , 50 ± 2.12 cm) (table .2). This larger size of subjects aged 60-64 compared to those of older age groups reflects the reduction in height which is one of the phenomena attributable to aging. It is actually a shortening of the spine (1.2 to 5 cm) caused by thinning of the dorsolumbar vertebrae due to osteoporosis. This phenomenon, which is more marked in women, begins in their fifties (de Jaeger, op. Cit.) [14]. The results obtained show that the senior women of the Maison Petite Sœur des Pauvres in the 70-74 age group have a significantly higher weight compared to those of colleagues in the 80-84 age groups, 75-79 years, 60-64 years, 65-69 years and 90-94 years (82.00 ± 0.00 Kg Vs 53.00 ± 2.16 Kg, 52.00 ± 2.83 Kg, 51.75 ± 4.19 Kg, 47.50 ± 3.54 Kg and 38.5 ± 0.71 Kg, p <0.05) (Table .2).

These results are dependent on a tendency to obesity in the young and old and the loss of lean mass with advancing age. Indeed, as of the advancement in age, the young old people accumulate adipose tissue while the oldest (75 years and over) gradually lose their muscle tissue and water (Mc'ardle et al., 2001) [15 ]. These results are similar to those obtained by Fakhouri et al. (2012) [16]. These authors make the same observation, noting that the prevalence of obesity is significantly higher among seniors aged 65 to 74 (41%) compared to others aged 75 and over (28%). These results also corroborate those of Schoenberget al. (2002) [16] who

observed twice as many people aged 75 and over underweight compared to younger people (5.0% and 1.2%). Since body weight is correlated with bone mass, the decrease in bone mass may be responsible for the decrease in body weight in people aged 90-94. The IMC being proportional to weight, senior women in the age group of 90-94 years are leaner than younger ones ($17.03 ± 1.13$ Kg.m$^{-2}$ vs $21.55 ± 0.72$Kg .m$^{-2}$, $20.54 ± 0.77$ Kg.m$^{-2}$, $22.27 ± 0.37$Kg.m$^{-2}$, $23.6 ± 0.17$Kg.m$^{-2}$ and $39.59 ± 0.83$ Kg. m$^{-2}$, p <0.05) (Table 2). These results are always lower compared to those of their American counterparts. In this regard, Rikli et al. (op cit) [17], for the same physical tests, obtained the following mean scores respectively: ☐-4.5cm- + 1cm☐; ☐-8cm- -1cm☐; ☐8-13☐; ☐4-11☐; ☐11.5s-7.3s☐ and ☐275m-480m☐. The comparison of the results of residents of the Little Sister of the Poor Institution with those of the standard values of Rikli et al. (op cit) [17] reveal the physical weakness of the former.

In fact, compared to subjects of other age groups, 60-64 year olds are significantly more flexible in their lower limbs (-3.06 ± 0.13 Vs -4.00 ± 0.00, -4.5 ± 0.00, -5.00 ± 0.00, -5.50 ± 0.41 and -6.50 ± 0.35) and upper limbs (-11.75 ± 0.29 Vs -13.00 ± 0.71, -14.00 ± 1.41, -15.00 ± 1.41, -17.00 ± 0.82 and -21.00 ± 0.00; p☐0.05), (table. 3). These results denote a decline in the ability of subjects to perform larger movements as they age. They are explained by the failure of joint flexibility in connection with the progressive reduction of the conjugation cartilage, calcification of the ligaments with age.This can be linked to the thickening of the joint capsule by the waste responsible for the reduction range of movement In addition, they are compared to those of other stronger age groups of the arms (12.50 ± 0.58 Vs 11.75 ± 0.35, 11.5 ± 0.71, 11.50 ± 0 , 71, 9.50 ± 0.58 and 07.5 ± 0.71) and legs (11.50 ± 0.58 Vs 9.50 ± 0.71, 07.5 ± 0.71, 7.00 ± 0.00, 5.5 ± 0.58 and 3.00 ± 0.00) (p☐0.05). They are also more agile compared to the older ones (11.63 ± 0.77 Vs 12.77 ± 0.35, 13.22 ± 0.04, 13.5 ± 0.01, 14.73 ± 0.98 and 15.39 ± 0.58; p☐0.05). Therefore, the reduced activity of myosin-ATPase, ATP and CrP especially in FT II affects muscle function. All age-related changes affect ATP production and physical work capacity, and they are more enduring than other age groups (327.25 ± 6.91m Vs271.46 ± 4, 01 m, 99.44 ± 0.00 m, 92.63 ± 0.53, 91.59 ± 0.29 m, 85.83 ± 0.42m; p☐0.05). These results are dependent on the reduction in maximum heart rate, stroke systolic ejection volumesystolic ejection,, arteriovenous $O_2$ difference, and peak $O_2$ uptake $O_2$maximum consumption (Broock and Fahey, 1985) [18]. These authors have pointed out that aging impairs the heart's ability to pump blood resulting from the gradual reduction in contractile force itself linked to the decrease in the capacity of activity ($Ca^{2+}$, myosin-ATPase). These results agree with those obtained by Fournier et al. (2012) [19]. In sum, this study reveals the lower proportion of independent seniors in the Little Sister of the Poor House, more elderly people with functional limitations or totally dependent. Overall, the independent seniors of the Little Sister of the Poor House have poor physical condition by standard values (Rikli et al., 1999 [21]; Fournier et al., 2012) [20]. Aging induces a gradual deterioration in the functional status, body composition and physical condition of the seniors of the Little Sister of the Poor House.

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