

# Level and Determinants of Physical Activity in Chronic Hemodialysis Patients at the Donka National Hemodialysis Center

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## Abstract

**Introduction:** Regular physical activity plays a protective role over the cardiovascular system and also against cardiovascular risk factors, and improves the prognosis of patients. The aim of this study was to assess the overall level of physical activity in chronic hemodialysis patients and the factors associated with low levels of activity. **Research subjects and methods:** A four-month long cross-sectional descriptive and analytical study was performed on chronic hemodialysis patients of all ages, regardless of sex, who agreed to take part in the study. There were both quantitative and qualitative variables in this study, and the Baecke questionnaire was used. **Results:** Out of 237 hemodialysis patients, 211 were included in our study, i.e., a frequency of 89.02%. The work activity index was low in 91% of cases, the sports activity index was low in 19 out of 20 patients, and the leisure activity index was low in 63% of patients. Meanwhile, the overall physical activity level was low in 76.8% of patients. In our study, low physical activity was significantly correlated with the gender of patients, unemployment of patients since starting dialysis, diabetic nephropathy, diabetes, obesity, dilated cardiomyopathy, a sedentary lifestyle, or interdialytic weight gain  $\geq 3$ kg. **Conclusion:** The assessment of patients' physical activity should be integrated into hospital practices for better management of chronic hemodialysis patients.

## Key words

Physical activity

Associated factors

Chronic hemodialysis patients in Conakry

## 1. Highlights of the study

What is known about the subject: In chronic hemodialysis (CHD) patients, physical activity reduces cardiovascular risk factors and improves prognosis. However, little is known about the determinants of physical activity levels in CHD patients in Guinea.

The question addressed in this study: Determinants of physical activity levels in CHD patients at the Donka National Hemodialysis Centre in Conakry.

What is new about this study: Physical activity is reduced in more than 3/4 of CHD. Low PA is correlated with gender (female), unemployment during dialysis, diabetic nephropathy, obesity, dilated cardiomyopathy, sedentary lifestyle, and interdialytic weight gain  $\geq 3$  kg.

Implications for practice, policies, and future research: Regulation of these factors could improve the level of physical activity and prognosis of CHD in Conakry.

## 2. Introduction

Regular physical activity is not only beneficial for the general population, but also those with chronic illnesses, and the fight against a sedentary lifestyle has now become a real public health issue [1-3].

In addition to the health benefits, regular physical activity increases endurance, improves quality of life and independence, and reduces cardiovascular risk factors [4].

The assessment of physical activity and the introduction of programs to encourage regular PA are recommended in patients with chronic kidney disease (CKD) as in the general population [5-7]. This recommendation applies regardless of age, with adjustments to the intensity of physical activity for elderly subjects [6-8]. A sedentary lifestyle is frequently observed in CHD, whose physical capacities are greatly reduced compared to healthy subjects [14,9].

In patients with CKD, physical activity plays a protective role for the cardiovascular system and also against cardiovascular risk factors, and improves

prognosis [10-15].

Given the absence of previous studies on this subject in our country, we thought it would be useful to carry out this study to assess the overall level of physical activity in CHD patients and the factors associated with low activity levels.

## 3. Research subjects and methods

A 4-month long descriptive cross-sectional study was performed from July 1 to October 30, 2021.

Target population: All hemodialysis patients at the Donka National Hemodialysis Center during the study period.

Study population: All CHD patients capable of regular physical activity.

Inclusion criteria: CHD patients of any age, regardless of sex, who agreed to take part in the study.

Non-inclusion criteria: CHD patients that were not included in this study are those with the characteristics described below.

- (i) Holidaymakers (following their sessions abroad)
- (ii) Patients with fractures or amputations of the lower limbs
- (iii) Patients who are not physically independent

Study variables: The physical activity was assessed using the Baecke questionnaire. It comprises 16 questions in total, divided into three indices work activity index (WAI, 8 questions), sports activity index (SAI, 4 questions), and leisure activity index (LAI, 4 questions). The indices are the average of the scores for each question, which ranges from 1 to 5.

- (i) Low activity corresponds to drivers, salespeople, teachers, journalists, lawyers, doctors, architects, housewives with small families, students, and computer scientists.
- (ii) Moderate activity corresponds to manual labor with less strenuous jobs, soldiers, cooks, electricians, technicians, carpenters, mechanics, nurses, bricklayers, policemen, firemen, laboratory assistants, nursery school

teachers, physiotherapists, photographers, gardeners, and butchers.

- (iii) High activity corresponds to professional sportsmen and women, construction workers, miners, steelworkers, farmers and refuse collectors.

The calculation of the indices, which are WAI, SAI, and LAI was carried out as follows:

$$\text{Work} = [i1 + (6-i2) + i3 + i4 + i5 + i6 + i7 + i8] / 8$$

$$\text{Sport} = [i9 + i10 + i11 + i12] \text{index} / 4$$

$$\text{Leisure activities} = [(6-i13) + i14 + i15 + i16] / 4$$

The scores of WAI ranged between 1 and 5, making it possible to classify the subjects according to 3 levels, as recommended by the Inter-Regional Institute of Health (l’Institut inter Régional pour la Santé [IRSA]).

- (i) WAI < 2.5: Low
- (ii) WAI = 2.5–3.1: Moderate
- (iii) WAI > 3.3: High

The sports activity index was used to classify subjects according to two levels of sports activity.

- (i) SAI < 2.5: Low
- (ii) SAI > 2.5: High

The leisure activity index was used to classify subjects according to two levels of leisure activity.

- (i) LAI < 2.5: Low
- (ii) LAI > 2.5: High

The overall score of physical activity was the sum of the indices. This score enabled us to classify the subjects according to three levels of physical activity.

- (i) A score of < 6 was considered low physical activity
- (ii) A score of 6–8 was considered moderate physical activity
- (iii) A score of > 9 was considered high physical activity

### 3.1. Data analysis and processing

Our data were collected and entered using EpiData 3.1 and analyzed using IBM SPSS 22. Chi-square and Fisher’s exact tests were used to determine the

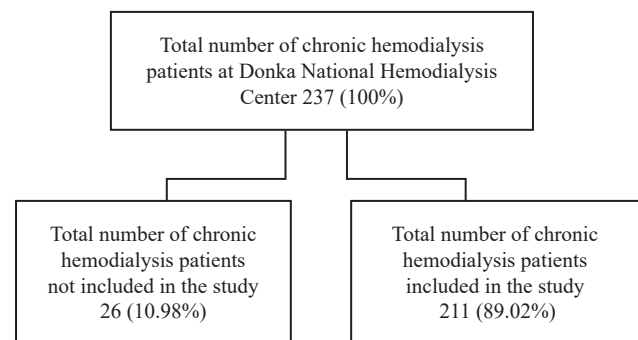
relationship between variables with a significance level of 5%. Any *P-value* less than 5% (< 0.05) was considered statistically significant.

### 3.2. Ethical considerations

Information received from patients was confidential and anonymous with their free and informed consent.

## 4. Results

Two hundred and thirty-seven patients underwent hemodialysis at the Donka National Hemodialysis Center. Among them, 26 were not included in our study (12 patients refused to take part in the survey, and 14 had no autonomy).



**Figure 1.** Flow chart for the frequency of CHD patients at the Donka National Hemodialysis Center

**Table1.** Results of physical activity assessment

Parameters	N	%
<b>Work activity index (WAI)</b>		
Low	192	91
Moderate	16	8
High	3	1
<b>Sports activity index (SAI)</b>		
Low	200	95
High	11	5
<b>Leisure activity index (LAI)</b>		
Low	132	63
High	79	37
<b>Overall physical activity index</b>		
Low	162	76.8
Moderate	49	23.2
High	0	0

**Table 2.** Factors associated with low levels of physical activity

Variables	P-value
Gender (Female)	0.000
Patients who have stopped working since starting dialysis	0.000
Diabetic nephropathy	0.012
Diabetes	0.001
Obesity	0.006
Dilated cardiomyopathy	0.030
Sedentary lifestyle	0.002
Inter-dialytic weight gain $\geq 3$ kg	0.000

Low overall physical activity was significantly correlated with the female gender, unemployment since starting dialysis, diabetic nephropathy, diabetes, obesity, dilated cardiomyopathy, sedentary lifestyle, and interdialytic weight gain  $\geq 3$  kg.

## 5. Discussion

Of the 237 haemodialysis patients, 211 were included in our study, i.e. a frequency of 89.02% (**Figure 1**). The sample size of our study was bigger than that of Rhair *et al.* in Morocco in 2014<sup>[17]</sup> and Ayed *et al.*<sup>[18]</sup> in Tunisia in 2020, who collected a total of 95 and 71 CHD patients in their studies, respectively. The difference in numbers is due to the recruitment method, as our center is the only public dialysis treatment center in Guinea that is financially accessible to patients with chronic end-stage renal disease of all social classes.

The WAI was low in 91% of our patients (**Table 1**). Our result was different from that of Gomes *et al.* in 2015, which showed that 47.4% of CHD were classified as sedentary based on the number of steps taken<sup>[19]</sup>.

In 2014, a study done by Ficcadori *et al.* in Italy found that a total of 104 CHD patients 52% were classified as inactive, 30% as moderately active and only 18% could be defined as active<sup>[20]</sup>. Low SAI (**Table 1**) was observed in our study in 19 out of 20 patients. In 2013, a study carried out by Karimi I *et al.* in Morocco on the evaluation of the level of physical activity in a Moroccan CHD service reported that out of

83 CHD patients, 15.6% had no physical activity, 68% of patients reported difficulties in performing physical activities, 16.4% of patients stated that they had regular physical and sporting activity<sup>[21]</sup>.

This result is thought to be due to patients' lack of awareness of the importance of regular exercise for their health.

A low LAI (**Table 1**) was noted in 63% of our patients. Our results are comparable to those of Mokoli VM *et al.* who reported in their study that out of 127 CHD patients, 62.2% had no or slight physical disabilities and 37.8% had moderate to severe physical disabilities<sup>[22]</sup>.

This result could be explained by the state of malaise associated with CKD, the side effects of dialysis and associated illnesses.

Low overall physical activity (**Table 1**) was predominant in 76.8% of our hemodialysis patients. Our results were different from those of Lagtarna in Morocco in 2020<sup>[23]</sup> who reported in his study a frequency of 63% of moderate overall physical activity in CHD patients; similarly, a study done by Avesani *et al.* in 2012<sup>[24]</sup> reported that 64% of patients had physical activity indicating a sedentary or not very active lifestyle; and Touil reported in 2016 in Senegal<sup>[25]</sup> a predominance of low overall physical activity in 71% of patients.

In our study (**Table 2**), low overall physical activity was significantly correlated with the female gender, patients who had not worked since starting dialysis, diabetic nephropathy, diabetes, obesity, dilated cardiomyopathy, sedentary lifestyle, and inter-dialytic weight gain  $\geq 3$ kg. In 2013, in Morocco, Karimi I *et al.*<sup>[22]</sup> reported a significant correlation between advanced age, duration on hemodialysis, cardiovascular disease, low body mass index, and low overall physical activity. In a survey of 505 nephrologists, Johansen *et al.* emphasized that although 97% of the respondents believed that physical activity was beneficial for dialysis patients, only 38% evaluated it and 5% had set up a program, mainly due to a lack of time and knowledge in this area, and also the fear of rejection from the patient<sup>[26]</sup>.

## 6. Conclusion

Physical activity was reduced in more than 3/4 of our CHD patients. None of our patients had high physical activity. Female patients, patients who have not worked since starting dialysis, and patients with diabetic nephropathy, diabetes, obesity, dilated cardiomyopathy, sedentary lifestyle, Inter-dialytic weight gain  $\geq 3$  kg

were among the factors that impede physical activity in our hemodialysis patients. Setting up a PA program for hemodialysis patients could be a way of improving their physical and psychological state. Physical activity assessment should be integrated into our hospital's practices for better management of CHD patients.

### Disclosure statement

The authors declare no conflict of interest.

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