

Level of physical activity of a male prison population measured with the IPAQ questionnaire

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ABSTRACT

Objectives: To describe the level of physical activity of a male prison population measured with the International Physical Activity Questionnaire (IPAQ), correlating years of sentence and age range.

Material and method: Non-experimental cross-sectional and descriptive study. The data was collected through the short version IPAQ questionnaire. The data was analyzed through descriptive statistics such as mean and standard deviation, and an inferential analysis was carried out, with a $P \geq 0.05$.

Results: The questionnaire was applied to a sample of 100 male prisoners from the city of Talca, Chile. They were grouped firstly into years of sentence and then by age range, obtaining a result from the evaluated population that shows moderate level of physical activity despite the context of confinement, in which walking is the activity that generates more MET's among the sample. There are no significant differences between the evaluated groups.

Discussion: The evaluated population shows a lower level of physical activity than a similar group in other countries, although they show better levels of physical activity when they are compared to the Chilean general public. Walking, which prisoners do every day in the modules and shared spaces in prison, is found to be a protective factor against chronic non-communicable diseases.

Key words: motor activity; questionnaire; prisoners; chronic disease.

Text received: 24/03/2022

Text accepted: 20/06/2023

INTRODUCTION

There are about 46,600 prison inmates in Chile¹, who despite their status as inmates are still entitled to their basic human rights².

The evidence suggests that time spent outside the cell or "exercise yard time" in Chilean prisons should be at least eight hours a day, although this period is subject to prison security requirements, and may be reduced when it is necessary to protect both inmates and prison officers³. Inmates may spend up to 16 hours a day in their cells, which may have a negative impact on their health given that they cannot carry out the minimum periods of phy-

sical activity recommended by the World Health Organisation (WHO)⁴.

The WHO has also declared that one of the most important human rights is access to maximum levels of health⁵. This makes it necessary to get a better idea of the levels of physical activity presented by this population, and use this data to see if conditions in prison have an effect on the inmates' state of health and establish the presence of chronic noncommunicable diseases (NCD).

The aim of this study is therefore to classify the level of physical activity of a male prison population at Talca Prison and correlate this variable with the period spent in prison and the age groups, to see if there are significant differences in the sample.

MATERIAL AND METHOD

The study design is non-experimental and cross-sectional, since the variables were not subject to stimuli. The data sample was taken on one occasion. The study is descriptive, as it evaluates and gathers data about the level of physical activity (PA) of prison inmates at Talca Prison (Chile). It classifies the population according to the time spent in prison and the inmates' ages. The sample is a non-probabilistic convenience group, since the subjects were chosen for their accessibility. The sample members signed a consent form authorised by the Scientific Ethics Committee (CEC) of the Catholic University of Maule in line with the Helsinki Declaration for research on human beings; the same committee approved the study under document 274/2019.

The sample consisted of 100 male inmates in modules 1 and 2 at Talca Prison, grouped into the period that they had spent in prison and their age ranges. Their level of physical activity was determined by applying the short form of the International Physical Activity Questionnaire (IPAQ), which considers PA at three levels⁶:

- Intensity (slight, moderate, vigorous)
- Frequency (days a week)
- Duration (minutes a day)

The short form IPAQ may be used in studies on the regional and national prevalence of PA and its use enables the level of PA to be assessed according to the metabolic index measurement unit (or MET). One MET equals the number of calories that a body consumes at rest and increases according to the intensity of the action or activity that the person does. It has been established that 1 MET matches approximately 1kcal/kg/hour (at rest)^{7,8}.

For this study the following values were taken as a reference⁹:

- Walking: 3.3 METs
- Moderate PA: 4 METs
- Vigorous PA: 8 METs

Since the IPAQ is an instrument that evaluates the level of PA according to the METs generated in the previous seven days, the values should be multiplied by the time in minutes spent on each activity in one day and by the number of days a week in which they are carried out (MET-minute/week¹⁰).

Mean and standard deviation descriptive statistics were used, and an inferential analysis was carried out, in which the Kolmogorov-Smirnov test was applied to establish the sample distribution in the PA level variable^{11,12}.

After determining the sample distribution, the Mann-Whitney test was applied to establish a signi-

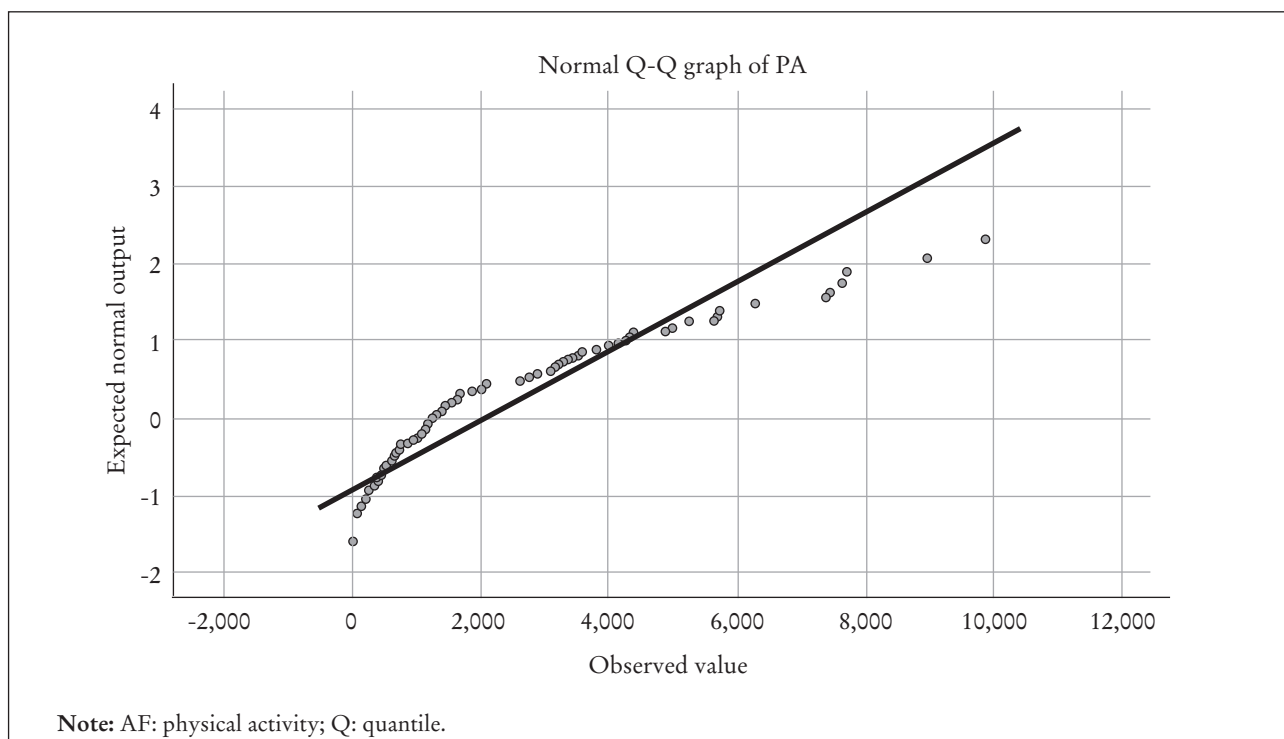


Figure 1. Distribution of the data of the sample measured with the Kolmogorov-Smirnov test.

ficance ratio between the groups or the means to find out if there was a significant difference between them, the aim being to see if there was a point of inflection between the data obtained by “years of sentence” and “age range” groups, with a level of significance of $p \geq 0.05$.

A Microsoft Excel 2016 spreadsheet was used to process the data and to create a database for the study for later analysis with the IBM SPSS Statistics version 23 statistics program.

RESULTS

Once the participants completed the IPAQ questionnaire, the Kolmogorov-Smirnov test was then applied to establish the sample distribution, as shown in the Q-Q (Figure 1), where distribution is non-normal (value $p = 0.00$).

Table 1 shows the results of the sample grouped into years of sentence completed, where all the groups were classified with moderate physical activity.

Inmates who had spent more than five years in prison presented higher levels of physical activity than the rest of the sample and the evaluated groups, at 2,382 METs/minutes a week. They were also the inmates who carried out vigorous physical activity at an average of twice a week with an average duration of 50 minutes. On the other hand, inmates who had spent between three and five years in prison were the ones who carried out the least physical activity per

week, obtaining an average of 1,591 METs/minutes week. However, the same group spends the least amount of time seated, at an average of 828 minutes, in comparison to the group of inmates that had spent <1 year in prison, who presented 1,105 minutes seated on average and the >5 years group, who spent an average of 1,042 minutes a week seated.

The most common activity amongst the inmates appears to be walking; more common than vigorous and moderate activity, with an average of 4.6 days a week, and a mean duration of 45.5 minutes a day, which enables them to obtain a moderate physical activity classification.

It was also observed that there was an increase of PA (according to the METs generated in the last seven days) after spending one year in prison, which then dropped after three years and increased again after five. No statistically significant differences were observed in the level of physical activity variable amongst the sample according to the years of sentence (Table 2).

The results of the sample grouped into age ranges (Table 3), showed that the level of PA of all the groups was moderate.

As regards vigorous activity, the inmates who spent the most days and time in this sort of activity, thus generating a larger number of METs, were the subjects in the 30-39 age group, who spent an average time on this type of physical activity of 1.1 day a week, or 31.5 minutes a day.

The age group between 19 and 29 years is the one that presents the largest amount of moderate physical

Table 1. Level of physical activity according to years of imprisonment.

		<1 year	1-3 years (N = 58)	3-5 years (N = 12)	>5 years (N = 8)	Total (N = 99*)
Vigorous Activities	7 days	0.6±1.2	1.1±1.7	0.75±1.1	2±2.4	1±1.7
	Time (minutes)	15.2±29.5	29.3±43.5	13.7±25.5	50.6±57.5	26.2±41.7
	MET's	248±483	640±1113	270±592	1125±1338	552±1013
Moderate Activities	7 Días	2.3±2.5	2.3±2.6	1.5±1.6	2.3±2.3	2.2±2.5
	Time (minutes)	35.4±36.4	46.4±45	56.6±89.5	50.6±32.6	45.7±50.6
	MET's	564.7±797.3	720±994	763±1419	713±872	692±1012
Walking	7 Días	4.8±2.8	4.5±2.8	3.9±3.2	5.3±2.6	4.6±2.9
	Time (minutes)	51.5±57.4	49.4±60.4	26.6±21.2	30±20	45.5±55.5
	MET's	1082±1358	1007±1385	558±775	545±384	932±1281
Time seated		1105±126	1034±228	828±325	1042±247	1012±268
Total physical activity		1894.4±2013	2366±2580	1591±1985	2382±1877	2175±2370
Classification		Moderate	Moderate	Moderate	Moderate	Moderate

Note. *One participant's questionnaire was rejected as the data and information did not match.
 MET: units of measurement of metabolic rate.

Table 2. Level of significance of physical activity by years of sentence.

	<1 year	1-3 years	3-5 years	>5 years
<1 year	-	0.863	0.512	0.393
1-3 years	0.863	-	0.502	0.498
3-5 years	0.512	0.502	-	0.263
>5 years	0.393	0.498	0.263	-

Note. Value $p \geq 0.05$

activity, at an average of 2.5 days a week and an average time of 49 minutes a day, generating 769 METs/minutes a week.

It should be pointed out that older inmates between 50 and 63 years of age were the ones who presented the highest volume of activity in walking, at a mean frequency of 58.8 minutes a day, 6.1 days a week. These figures place persons in this age group at a mean of 1,313 METs/minutes a week, well above the other groups where walking is concerned, with a physical activity classification of moderate.

Finally, the age group of 40-49 years shows a drop in METs generated every week with a mean of 1,276 METs/minutes a week. Although this score places them in the moderate classification, it is well below the average for the sample. Furthermore, this age group spends more minutes a day seated and is also the group that spends less time on any of the activities assessed in the IPAQ. No significant differences

were observed in the level of physical activity variable according to the subjects age (Table 4).

DISCUSSION

Any evaluation of physical activity in the prison population is an important tool since it enables information to be generated that can improve the provision of healthcare services and to adjust intervention strategies involving physical activity¹³.

According to the data obtained, we found that, regardless of how the subjects were grouped, they presented a moderate level of physical activity reported in a week, with a mean of 2,175 METs/minutes generated a week, which differs from the research carried out by Franco & Flores¹⁴, who stated that a group of Colombian workers did not reach 600 METs a week, thus placing them in a category of physically inactive. It can be seen that the mean METs generated per minute per week by the inmates is much lower than the levels found in studies carried out on Italian prisons, which indicate that Italian inmates generated between 6,966 and 9,278 METs/minutes a week, thus presenting higher levels of physical activity in comparison to ones found in the community^{15,16}.

However, closer study of the minutes completed according to the intensity level of the activity (vigorous, moderate and walking) shows that they do not meet the recommendations for physical activity pro-

Table 3. Level of physical activity according to age group.

		19-29 years (N = 42)	30-39 years (N = 39)	40-49 years (N = 10)	50-63 years (N = 8)	Total (N = 99)*
Vigorous Activities	7 days	1±1.7	1.1±1.5	0.4±0.9	1±2.2	1±1.7
	Time (minutes)	23.2±32.9	31.5±46.6	27±57.6	15±30	26.2±41.7
	MET's	513±984	658±1020	504±1289	300±572	552±1013
Moderate Activities	7 Días	2.5±2.5	2.1±2.3	1.7±2.1	1.6±2.5	2.2±2.5
	Time (minutes)	49±55.2	48.9±50.3	31±29.1	30±39.6	45.7±50.6
	MET's	769±1115	726±995	368±523	510±854	692±1012
Walking	7 Días	4.7±2.6	4.3±3.1	3.8±2.6	6.1±2.3	4.6±2.9
	Time (minutes)	47.6±54.3	46.4±64.3	24.5±16.1	56.8±38.1	45.5±55.5
	METs	919±1223	1002±1500	404±389	1313±881	932±1281
Time seated		1024±257	1007±242	1126±131	1050±130	1012±268
Total physical activity		2201±2256	2387±2716	1276±1658	2123±1492	2175±2370
Classification		Moderate	Moderate	Moderate	Moderate	Moderate

Note. * One participant's questionnaire was rejected as the data and information did not match. MET: units of measurement of metabolic rate.

Table 4. Level of significance of physical activity according to age group.

	19-29 years	30-39 years	40-49 years	50-63 years
19-29 years	-	0.716	0.097	0.701
30-39 years	0.716	-	0.259	0.810
40-49 years	0.097	0.259	-	0.213
50-63 years	0.701	0.810	0.213	-

Note. Value $p \geq 0,05$.

posed by the WHO¹⁷, since the most common activities are aerobic and strength-based exercises.

As for the age groups, the results show that there is a drop in the levels of physical activity in the 40-49 age group, with an increase in activity from 50 years of age upwards. These data are different from the ones found by Sigmundová *et al.*¹⁸, who state that the levels of physical activity diminish with age, while another study comes to the same conclusions for an adult population in Ecuador, stating that the older the subject, the lower the level of physical activity, with a prevalence of physical inactivity¹⁹.

Finally, it was observed that the sample presented better indicators than in the Chilean community. According to the National Health Survey of the Chilean Ministry of Health²⁰, 86.7% of the Chilean population is sedentary and does not meet the recommended minimum weekly levels of physical activity or energy expenditure.

The inmates who participated in this study presented moderate weekly physical activity levels with no significant differences being found between age groups or period spent in prison, while the activity that generated the most METs in prison was walking.

The subjects' observed level of physical activity is a protective factor against chronic noncommunicable diseases²¹.

The limitations of this study are that it was carried out at just one Chilean prison, and so cannot be taken as a reference for other prisons in the country. We suggest that any future research on this population should include a representative sample of the situation in Chile, along with other variables such as diet, occupational activities, educational levels and body composition.

CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest in this study.

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