



## Original Research

## Low back pain prevalence, capacity, and performance according to sociodemographic variables, population-based study in Chile

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## ABSTRACT

**Background:** Low back pain (LBP) is one of the main causes of disability and need for rehabilitation services. It is necessary to have a better understanding about the association of sociodemographic factors with the disability related to individuals with LBP.

**Objective:** Assess the prevalence of LBP and its association with capacity, performance, and sociodemographic variables in Chilean population.

**Methods:** Cross-sectional study was performed with data from the population survey from Chile, 2015. People over 17 years old were selected for the analysis (n = 12,265 people). The variables chosen were: presence of LBP, place of living in Chile, sex, age, marital status, education, income, work status, and type of home. Capacity and performance levels were assessed by the Model Disability Survey. The population characteristics, performance, and capacity values were presented through means or frequencies. A generalized linear model with logarithmic linkage and gamma distribution was employed to assess the associations between the explanatory variables and the outcomes, considering the distribution of the variables, while adjusting for all study variables.

**Results:** 22 % of the population reported having LBP. People with LBP had worse levels of capacity and performance. Being female, older age, having worse education level, and worse health classification, were factors associated with worse capacity and performance in those with LBP. Conversely, being employed in the last week was correlated with improved capacity in this group.

**Conclusion:** Individuals with LBP demonstrated poorer capacity and performance outcomes, with sociodemographic variables influencing their functioning.

## Introduction

Estimates from the Global Burden of Disease (GBD) shows that about 15 % of the population has severe disability,<sup>1</sup> and despite this, there is still little standardized information on the association of sociodemographic factors with disability, especially in low and middle-income countries.<sup>2,3</sup> Low back pain (LBP) is one of the main causes of disability and need for rehabilitation services around the globe, and with population aging, this health condition becomes increasingly important in the context of health care.<sup>4,5</sup> In 2015, LBP was responsible for 60.1 million disability-adjusted life years (DALYs), an increase of 54 %

compared to 1990, with emphasis on a pronounced increase in low and middle-income countries.<sup>6</sup>

Most LBP cases have unspecific causes and a favorable prognosis, but recurrence of pain is common.<sup>7</sup> Moreover, a proportion of these cases can lead to persistent disability.<sup>8</sup> This requires deeper understanding of possible factors that can contribute to disabling LBP. Disability is an indicator that provides information about the impacts and needs inherent to the health of the population<sup>9</sup> and complements mortality and morbidity data, helping to estimate the rehabilitation needs of the population.<sup>10</sup>

The World Health Organization (WHO), through the International

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Classification of Functioning, Disability and Health (ICF), defines disability as a generic term for impairments, activity limitations, and restrictions on participation. Disability represents the negative aspects of the interaction between an individual (with a health condition) and its contextual factors (environmental and personal factors). On the other hand, functioning indicates a positive interaction within this context.<sup>11</sup>

Other terms described by the ICF are: performance, which is defined as “performing tasks in the usual environment” and capacity, which is defined as “execution of tasks in a standard environment”.<sup>11</sup> To perform a population-wide assessment of disability, the WHO prepared the Model Disability Survey (MDS), aligned with the ICF model, aiming to be an instrument for collecting information at a population level.<sup>9</sup> The main objectives of MDS are to: provide estimates of the prevalence of disabilities comparable and standardized across countries; provide the necessary data and information to plan interventions, policies, and programs aimed to people with disability (PwD), and provide indicators to monitor the implementation of the recommendations of the Convention on the Rights of PwD.<sup>12</sup>

Despite the wide range of studies on LBP, there is a need for a better understanding of the association of sociodemographic factors with disability related to people affected by LBP. The study by Costa et al.<sup>13</sup> discussed some sociodemographic factors, such as schooling and work, but on an occasional basis. Safiri et al.<sup>14</sup> in a study seeking to analyze the prevalence, death, and adjusted life years due to incapacity regarding musculoskeletal disorders, show that there is a shortage of data, mainly in developing countries, and this is a concern in GBD studies. Studies that focus on biological and cognitive aspects<sup>15</sup> are more frequent, although the biopsychosocial nature and the relationship of the determinants of health and non-communicable chronic diseases are already discussed in the literature.<sup>16</sup> The majority of existing research on this topic tends to focus on the individual and clinical perspective of the relationship between sociodemographic issues and pain, rather than analyzing it from a population-based standpoint. In addition, there are the limitations already described in the literature on the scarcity of data, underreporting, and the lack of a harmonized system to connect data sources.<sup>17</sup> Furthermore, there is a notable lack of health surveys assessing the prevalence of LBP at the population level and, more importantly, its relationship with functioning, a need already recognized in the literature.<sup>18</sup> Sharma and McAuley<sup>18</sup> defended in an editorial the need for research on LBP using reliable measures and valid and representative samples, with the incorporation of questions related to LBP in national health surveys as a possible solution. Thus, the aim of this study was to assess the prevalence of LBP and its association with capacity, performance, and sociodemographic variables in the Chilean population.

## Methodology

### *Study design, setting, and participants*

This is a secondary analysis of a Chilean national survey conducted in 2015. Data from the II Estudio Nacional de la Discapacidad was obtained in a public, open access repository available on [https://www.senadis.gob.cl/pag/356/1625/base\\_de\\_datos](https://www.senadis.gob.cl/pag/356/1625/base_de_datos).

The II ENDISC is a household survey with Chilean civil society, funded and conducted by the Ministry of Social and Family Development. The data gathering was done from July/2015 to September/2015 in all regions of the country, in rural and urban areas. By means of statistical calculation aiming at a representative sample, 17,780 people were interviewed. The present study selected those over 17 years old, for the analysis, for a total of 12,265 people.<sup>19</sup> The STROBE guideline was used to guide data reporting in this manuscript.

### *Study variables and data sources*

The presence of LBP was determined through the participant's self-

report when asked if they were experiencing backache or lumbosciatic pain: “¿Tiene usted lumbago o lumbociática (dolor de espalda o problemas a los discos)?” with the answer options “yes” or “no”.<sup>20</sup>

The data collection was conducted through home interviews administered by trained interviewers from the Ministry of Social and Family Development. The sociodemographic variables selected for the study were: regions of Chile where they live, sex, age group, marital status (single, married/stable union, widowed, divorced/separated), educational level (no education, incomplete primary, complete primary, incomplete secondary, complete secondary, incomplete higher, graduated), income (categorized into quintiles), working situation (worked for less than 1 hour in the last week, did not work at least 1 hour in the last week) and type of housing (house, house with wall and roof neighbor on one side, house with wall and roof neighbor on both sides, apartment in a building with elevator, apartment in a building without elevator, tenement, emergency housing, ranch or cabin, precarious accommodation made with reused materials, no information). The option about the participant's perception of their health was also selected, which could range from very good, good, regular, poor, or very poor.

Performance and capacity are expressed by scores that range from 0 to 100 (the worst score). The instrument uses the concepts of performance and capacity as described in the ICF, namely: performance, which is defined as “performing tasks in the usual environment,” and capacity, which is defined as “execution of tasks in a standard environment.”<sup>11</sup>

In the performance variable, information was collected regarding the difficulty in performing activities related to mobility, use of limbs (e.g., handling small objects), personal care, vision, hearing, pain, energy and motivation, breathing, emotion, interpersonal relationships, stress management, communication, cognition, household life, community participation and citizenship, caring for others, work, and study. Participants were asked to consider the assistance they receive from others, the medications they take, and all support devices they use, such as glasses. For the capacity variable, information was collected regarding difficulty in the same topics as performance, but participants were asked to report the difficulties they may face in performing certain activities exclusively due to their health condition and without considering assistive devices or help from others, hearing aids, canes, wheelchairs, prosthetics, technological devices, among others. These variables come from the functioning block of the MDS, an instrument used by the II ENDISC.<sup>9</sup>

### *Statistical analysis*

The characteristics of the study population were presented through means or frequencies and their respective confidence intervals (95 % CI), presenting the values of the total population and of the population with and without LBP. The means of performance and capacity and their respective 95 % CIs were presented according to sociodemographic characteristics for the total population and for the population with and without LBP. The prevalence of self-reported LBP occurrence was also calculated according to the study variables and for the total population, with their respective 95 % CIs.

The generalized linear model (GLM) with logarithmic linkage and gamma distribution was used to measure differences between categories of explanatory variables for outcomes due to the distribution of variables. The arithmetic means ratio (AMR) and their respective 95 % CIs are used to compare categories of the same response variable, and the differences are interpreted from a perspective percentage ( $p < 0.05$ ).

All study variables were included when adjusting the regression model, as well as the presence of other comorbidities, according to the reported presence (headache; anxiety; loss; absence or malformation of limbs; gastritis or ulcer; tumor or cancer; dementia; chronic kidney disease; skin diseases; schizophrenia; bipolarity; rheumatologic diseases, except arthritis or osteoarthritis; dependence on alcohol; drug addiction; HIV/AIDS; dental caries or gum problem; Chagas disease; neuromuscular diseases; epilepsy; thyroid disease; cranioencephalic

trauma; cerebral palsy; Down's syndrome; autism; sleep problems) present in the research database, to remove possible confusion that these may have on the results. The stepwise method was used to determine the variables in the final models. The study employed a sample design that

incorporated stratification and weighting, and as such, all analyses were conducted using the svy package in Stata 11 (State Corp., USA) to ensure the appropriate consideration of weights.

**Table 1**

Distribution of low back pain prevalence according to study variables.

Study Variables	Low Back Pain				Prev.	95 % CI	Total		
	No		Yes				p	n	%
	n	%	n	%					
Region					<0.001				
Taparacá	191	75.7	60	24.3	0.4	0.31, 0.61	251	2.0	
Antofogasta	403	86.3	69	13.7	0.4	0.34, 0.53	472	3.8	
Atacama	222	75.5	78	24.6	0.4	0.28, 0.50	300	2.4	
Coquimbo	435	79.9	114	20.1	0.8	0.69, 1.05	549	4.5	
Valparaíso	1155	81.4	282	8.0	1.2	1.72, 2.23	1437	11.7	
Ohiggins	438	77.6	142	22.4	1.16	0.96, 1.40	580	4.7	
Maule	600	86.1	120	13.9	0.8	0.65, 1.02	720	5.9	
Biobío	1233	74.9	408	25.1	3.0	2.54, 3.46	1641	13.4	
La Araucanía	498	72.8	190	27.2	1.5	1.29, 1.78	688	5.6	
Los Lagos	414	81.1	107	18.9	0.9	0.75, 1.12	521	4.2	
Aysen	227	80.7	48	19.3	0.1	0.07, 0.15	275	2.2	
Magallanes y La A.C	204	82.1	49	17.9	0.1	0.10, 0.22	253	2.1	
Metropolitana	2945	76.3	901	23.7	9.7	8.73, 10.68	3846	31.3	
Los Ríos	317	78.7	97	21.3	0.4	0.34, 0.60	414	3.4	
Arica y Parinacota	246	77.4	72	22.6	0.2	0.15, 0.27	318	2.6	
Total	9528	77.9	2737	22.1	22.0	21.02, 23.13	12265	100	
Sex					<0.001				
Male	4206	79.5	1101	20.5	9.9	9.09, 10.72	5307	43.3	
Female	5322	76.4	1636	23.6	12.2	11.37, 13.03	6958	56.7	
Age Group					<0.001				
18 to 30 years old	2297	90.0	273	10.0	2.5	2.13, 2.91	2570	20.9	
30 to 50 years old	3228	77.0	934	23.0	7.7	7.00, 8.45	4162	33.9	
50 to 65 years old	2209	70.1	894	29.8	7.4	6.74, 8.18	3103	25.3	
>65 years old	1794	73.4	636	26.5	4.4	3.97, 4.63	2430	19.8	
Educational Level					<0.001				
No Education	258	76.5	79	23.4	0.6	0.44, 0.79	337	2.7	
Incomplete Primary Level	1379	72.3	527	27.7	3.8	3.38, 4.28	1906	15.5	
Complete Primary Level	1005	69.9	409	30.4	3.3	2.88, 3.82	1414	11.5	
Incomplete Secondary Level	1311	75.6	449	24.4	3.4	3.05, 3.89	1760	14.3	
Complete Secondary Level	2640	76.6	772	23.4	6.5	5.91, 7.26	3412	27.8	
Incomplete Higher Education	1120	86.7	173	13.4	1.7	1.36, 2.06	1293	10.5	
Graduated	1810	85.1	328	14.8	2.6	2.25, 3.10	2138	17.5	
Marital Status					<0.001				
Single	3168	86.5	591	13.5	4.4	3.89, 4.91	3759	30.6	
Married/Stable Union	4615	74.2	1490	25.8	13.7	12.90, 14.63	6105	49.8	
Widower	881	71.6	331	28.4	2.0	1.69, 2.36	1212	9.9	
Separated / Divorced	864	72.6	325	27.4	1.9	1.62, 2.28	1189	9.7	
Working Situation - Worked at least 1 hour in the last week					0.2350				
No	4360	78.7	1271	21.3	9.4	8.75, 10.17	5631	45.5	
Yes	5168	77.3	1466	22.7	12.6	11.66, 13.63	6634	54.5	
Income quintiles					<0.001				
V (larger)	1818	83.9	381	16.1	2.9	2.50, 4.93	2199	17.9	
IV	1877	78.8	532	21.2	4.4	3.91, 4.93	2409	19.6	
III	1929	77.2	579	22.8	4.8	4.31, 5.43	2508	20.4	
II	1954	75.4	605	24.6	5.1	4.54, 5.78	2559	20.9	
I (smaller)	1950	74.8	640	25.2	4.7	4.27, 5.30	2590	21.1	
Type of Housing					0.0570				
House	3772	77.9	1079	22.1	8.4	7.73, 9.16	4851	39.5	
“House with wall and roof neighbor on one side”	2946	76.5	892	23.5	7.7	6.97, 8.53	3838	31.3	
“House with wall and roof neighbor on both sides”	1447	79.5	384	20.5	2.9	2.48, 3.41	1831	14.9	
Apartment in a building with elevator	395	84.2	77	15.8	0.8	0.59, 1.11	472	3.8	
Apartment in a building without elevator	803	78.5	245	21.5	1.8	1.37, 2.30	1048	8.5	
Tenement	29	69.2	12	30.8	0.1	0.04, 0.27	41	0.3	
“Emergency housing”	103	69.9	38	30.1	0.2	0.13, 0.42	141	1.1	
“Ranch or Cabin”	1	36.1	2	63.9	0.0	0.00, 0.03	3	0.0	
Precarious accommodation made with reused materials	10	87.8	3	12.2	0.0	0.00, 0.06	13	0.1	
No information	22	74.4	5	25.6	0.0	0.01, 0.12	27	0.2	
Health Rating					<0.001				
Very good	1431	93.2	100	6.8	0.9	0.70, 1.21	1531	12.5	
Good	4694	84.8	842	15.2	7.0	6.37, 7.72	5536	45.1	
Regular	2828	66.0	1383	34.0	10.9	10.18, 11.80	4211	34.3	
Poor	476	59.7	349	40.3	2.7	2.28, 3.12	825	6.7	
Very poor	93	61.4	62	38.8	0.4	0.32, 0.62	155	1.3	
No information	6	69.7	1	30.3	0.0	0.002, 0.12	7	0.1	

**Table 2**

Distribution of capacity means according to study variables.

Study Variables	Low back pain				Total	
	No		Yes			
Region	Mean	95 %CI	Mean	95 %CI	Mean	95 %CI
Taparacá	22.8	18.23, 27.36	34.6	30.48, 38.67	25.6	21.75, 29.57
Antofagasta	19.7	17.70, 21.80	31.0	27.89, 34.11	21.3	19.60, 23.00
Atacama	25.7	22.60, 28.81	40.0	36.94, 43.01	29.2	27.05, 31.34
Coquimbo	25.2	23.10, 27.28	37.4	34.29, 40.56	27.6	25.71, 29.59
Valparaíso	25.0	23.84, 26.18	37.7	35.49, 39.84	27.7	26.28, 28.44
Ohiggins	24.4	22.29, 26.60	40.4	38.02, 42.84	28.0	26.21, 29.84
Maule	25.7	23.95, 27.37	36.5	33.90, 39.04	27.2	25.60, 28.73
Biobío	23.6	22.47, 24.83	37.5	35.42, 39.67	27.1	25.91, 28.36
La Araucanía	24.2	22.21, 26.29	35.2	32.60, 37.78	27.2	25.49, 28.95
Los Lagos	25.9	24.06, 27.75	34.0	29.87, 38.23	27.4	25.56, 29.32
Aysén	22.3	19.96, 24.57	32.6	27.26, 37.93	24.2	22.55, 25.96
Magallanes y La A.C	27.4	23.24, 31.49	37.3	31.35, 43.20	29.1	25.83, 32.45
Metropolitana	23.9	23.06, 24.77	36.6	35.06, 38.16	26.9	26.07, 27.78
Los Ríos	28.0	25.71, 30.43	40.1	36.43, 43.84	30.6	28.04, 33.24
Arica y Parinacota	32.4	30.20, 34.70	41.4	37.65, 45.13	34.5	32.99, 35.94
Sex						
Male	21.1	20.42, 21.77	34.1	32.83, 35.29	23.7	23.11, 24.39
Female	27.6	26.89, 28.23	39.1	38.12, 40.15	30.3	29.67, 30.91
Age Group						
18 to 30 years old	17.8	17.04, 18.65	30.5	28.61, 32.40	19.1	18.32, 19.90
30 to 50 years old	21.1	20.34, 21.87	32.7	31.29, 34.06	23.7	23.04, 24.50
50 to 65 years old	28.9	27.99, 29.88	38.6	37.24, 39.98	31.8	30.99, 32.66
>65 years old	36.7	35.58, 37.81	44.8	43.04, 46.54	38.8	37.88, 39.80
Educational Level						
No Education	44.1	41.25, 47.04	51.2	46.46, 51.93	45.8	43.33, 48.26
Incomplete Primary Level	32.7	31.52, 33.92	41.6	39.77, 43.36	35.2	34.09, 36.26
Complete Primary Level	28.2	26.75, 29.70	39.4	37.39, 41.45	31.6	30.21, 32.98
Incomplete Secondary Level	25.2	23.92, 26.45	37.1	35.21, 38.98	28.1	27.00, 29.17
Complete Secondary Level	22.8	21.95, 23.69	34.1	32.85, 35.36	25.5	24.72, 26.21
Incomplete Higher Education	19.2	18.09, 20.39	33.5	30.34, 36.58	21.1	20.00, 22.25
Graduated	19.8	18.78, 20.73	32.4	30.49, 34.26	21.6	20.70, 22.56
Marital Status						
Single	20.7	19.93, 21.54	34.9	33.38, 36.45	22.6	21.86, 23.42
Married / Stable Union	24.6	23.99, 25.31	35.9	34.80, 36.96	27.5	26.96, 28.13
Widower	37.9	36.30, 39.53	46.1	44.00, 48.28	40.2	38.90, 41.61
Separated / Divorced	28.9	27.42, 30.37	38.6	36.11, 41.17	31.6	30.20, 32.92
Working Situation - Worked at least 1 hour in the last week						
No	29.0	28.26, 29.76	41.9	40.79, 43.15	31.8	31.06, 32.48
Yes	20.6	20.03, 21.20	33.0	31.99, 34.09	23.4	22.87, 23.99
Income quintiles						
V (larger)	20.6	19.54, 21.71	32.8	30.87, 34.70	22.6	21.58, 23.57
IV	23.2	22.26, 24.24	35.0	33.35, 36.70	25.7	24.86, 26.63
III	24.1	23.06, 25.09	37.1	35.46, 38.72	27.0	26.07, 28.01
II	27.4	26.35, 28.45	38.1	36.55, 39.61	30.1	29.06, 30.99
I (smaller)	26.7	25.66, 27.77	39.5	37.76, 41.29	29.9	29.00, 30.87
Type of Housing						
House	24.3	23.51, 25.04	37.1	35.83, 38.45	27.1	26.37, 27.87
"House with wall and roof neighbor on one side"	25.1	24.29, 25.90	37.1	35.45, 38.70	27.9	27.15, 28.67
"House with wall and roof neighbor on both sides"	25.0	23.87, 26.09	37.9	35.86, 39.89	27.6	26.57, 28.67
Apartment in a building with elevator	21.1	18.96, 23.31	32.8	38.92, 36.66	22.9	20.93, 25.01
Apartment in a building without elevator	23.1	21.20, 25.05	35.8	33.02, 38.52	25.8	23.99, 27.71
Tenement	22.1	18.82, 26.31	29.2	24.23, 34.10	24.2	21.12, 27.38
"Emergency housing"	22.9	18.18, 27.71	31.9	24.33, 39.45	25.6	21.15, 30.13
"Ranch or Cabin"	0.2	-	51.1	46.54, 55.73	32.7	2.78, 62.70
Precarious accommodation made with reused materials	30.5	15.16, 45.78	58.8	56.0, 61.52	33.9	19.76, 48.08
No information	34.8	23.00, 46.64	38.3	31.70, 44.87	35.7	26.93, 44.48
Health Rating						
Very good	11.7	10.89, 12.56	23.8	17.80, 29.91	12.5	11.61, 13.48
Good	20.1	19.54, 20.63	27.6	26.59, 28.69	21.2	20.73, 21.73
Regular	34.1	33.32, 34.83	39.6	38.68, 40.53	35.9	35.36, 36.55
Poor	49.2	47.79, 50.68	51.0	49.49, 52.59	49.9	48.92, 51.01
Very poor	58.3	55.00, 61.58	55.8	53.11, 58.53	57.3	55.10, 59.57
No information	30.1	14.53, 45.66	48.8	/	35.7	21.92, 49.61

## Results

The study population was 12,265 people, of whom 2,737 (22.06 %) reported having LBP. The prevalence of LBP in the regions of Chile ranged from 0.1 % to 9.7 %, being higher in females (12.2 %), aged between 30 and 50 years old (7.7 %), with complete secondary level

education (6.5 %), married/united (13.7 %), with the second lowest income quintiles (5.1 %), and who classified their health as regular (10.9 %) (Table 1).

Capacity and performance means are presented in Tables 2 and 3, respectively. The values are presented according to sociodemographic variables and all capacity and performance means are greater (i.e.,

**Table 3**  
Distribution of performance means according to study variables

Study Variables	Low back pain				Total	
	No		Yes			
	Mean	95 %CI	Mean	95 %CI	Mean	95 %CI
Region						
Taparacá	31.0	27.42, 34.58	42.9	40.92, 45.02	33.9	30.96, 36.86
Antofogasta	25.8	23.27, 28.36	37.6	34.69, 40.45	27.4	25.01, 29.84
Atacama	32.6	30.05, 35.23	45.7	42.79, 48.60	35.8	33.86, 37.80
Coquimbo	33.2	31.19, 35.15	44.8	42.94, 46.67	35.5	33.72, 37.30
Valparaíso	31.5	30.10, 32.89	42.7	40.83, 44.61	33.6	32.32, 34.83
Ohiggins	28.0	25.60, 30.48	43.7	41.07, 46.28	31.5	29.53, 33.53
Maule	33.6	31.72, 35.44	44.5	42.33, 46.74	35.1	34.41, 36.80
Biobío	31.2	29.86, 32.56	44.7	42.97, 46.39	34.6	33.37, 35.81
La Araucanía	32.5	30.47, 34.51	42.7	40.11, 45.40	35.3	33.41, 37.15
Los Lagos	35.1	33.29, 37.00	44.3	41.57, 47.02	36.9	35.22, 38.53
Aysén	29.0	26.55, 31.46	41.2	37.27, 45.24	31.4	29.21, 33.52
Magallanes y La A.C	35.7	31.87, 39.48	45.2	41.57, 48.79	37.4	34.18, 40.57
Metropolitana	30.8	29.82, 31.84	43.9	42.71, 45.15	33.9	32.99, 34.89
Los Ríos	34.2	31.95, 36.49	44.4	41.57, 47.14	36.4	34.35, 38.41
Arica y Parinacota	36.9	34.93, 39.06	44.5	41.64, 47.38	38.7	37.40, 39.98
Sex						
Male	28.3	27.58, 29.10	41.5	40.54, 42.43	31.0	30.35, 31.72
Female	34.4	33.73, 35.05	45.7	44.84, 46.52	37.0	36.45, 37.65
Age Group						
18 to 30 years old	26.2	25.20, 27.12	39.3	37.78, 40.91	27.5	26.57, 28.39
30 to 50 years old	29.0	28.21, 29.84	41.5	40.41, 42.57	31.9	31.14, 32.65
50 to 65 years old	34.5	33.48, 35.63	44.4	43.15, 45.62	37.5	36.58, 38.40
>65 years old	41.5	40.52, 42.58	49.3	48.23, 50.44	43.6	42.78, 44.45
Educational Level						
No Education	46.9	44.63, 49.28	53.5	49.63, 57.40	48.5	46.50, 50.49
Incomplete Primary Level	39.5	38.44, 40.65	47.8	46.34, 49.23	41.8	40.84, 42.82
Complete Primary Level	34.6	33.19, 36.05	45.2	43.85, 46.65	37.8	36.59, 39.05
Incomplete Secondary Level	32.9	31.79, 34.01	44.3	42.96, 45.72	35.7	34.71, 33.66
Complete Secondary Level	29.8	28.90, 30.77	41.5	40.34, 42.76	32.6	31.75, 33.40
Incomplete Higher Education	27.4	25.89, 28.84	40.5	38.06, 42.87	29.1	27.70, 30.15
Graduated	26.6	25.42, 27.71	41.0	39.49, 42.61	28.7	27.64, 29.79
Marital Status						
Single	28.2	27.40, 29.13	41.1	41.12, 43.79	30.2	29.36, 30.99
Married / Stable Union	31.6	30.92, 32.38	42.1	42.11, 43.87	34.6	33.96, 35.19
Widower	42.8	41.54, 44.15	48.8	48.76, 52.02	44.9	43.92, 46.06
Separated / Divorced	35.6	33.98, 37.13	44.1	44.06, 47.48	37.3	37.01, 39.69
Working Situation - Worked at least 1 hour in the last week						
No	35.4	34.70, 36.17	47.2	46.30, 48.19	37.9	37.27, 38.63
Yes	28.1	27.49, 28.79	41.2	40.33, 42.11	31.1	30.50, 31.72
Income Quartile						
V (larger)	27.1	25.96, 28.31	40.1	38.27, 42.07	29.2	28.10, 30.36
IV	30.3	29.12, 31.44	41.9	40.45, 43.40	32.7	31.73, 33.75
III	31.4	30.28, 32.51	44.1	42.82, 45.30	34.3	33.30, 35.27
II	34.4	33.37, 35.34	44.7	43.47, 46.01	36.9	36.04, 37.78
I (smaller)	34.1	33.02, 35.14	46.5	45.47, 47.55	37.2	36.29, 38.11
Type of Housing						
House	31.6	30.74, 32.42	43.9	42.85, 44.91	34.3	33.54, 35.07
“House with wall and roof neighbor on one side”	31.9	31.04, 32.94	43.9	42.64, 45.26	34.8	33.94, 35.66
“House with wall and roof neighbor on both sides”	31.6	30.43, 32.72	44.2	42.62, 45.82	34.2	33.14, 35.18
Apartment in a building with elevator	27.8	25.34, 30.36	41.2	38.06, 44.37	29.9	27.58, 32.34
Apartment in a building without elevator	30.5	28.58, 32.51	43.5	41.48, 45.49	33.3	31.46, 35.21
Tenement	30.7	26.58, 34.77	40.9	36.53, 45.25	33.8	30.38, 37.27
“Emergency housing”	29.1	23.54, 34.61	41.9	36.95, 46.77	32.9	27.94, 37.90
“Ranch or Cabin”	30.9	-	49.5	38.02, 60.94	42.8	25.58, 57.03
Precarious accommodation made with reused materials	34.4	17.80, 51.01	64.9	63.96, 35.81	38.1	22.75, 53.49
No information	38.	26.03, 50.54	45.7	38.53, 52.82	40.2	31.15, 49.21
Health Rating						
Very good	17.6	16.52, 18.86	33.8	28.91, 38.69	18.8	17.55, 20.02
Good	27.5	26.88, 28.11	36.5	35.50, 37.48	28.8	28.30, 29.43
Regular	42.0	41.42, 42.60	46.2	45.45, 46.88	43.4	42.95, 43.89
Poor	52.2	50.96, 53.48	54.1	52.99, 55.30	53.0	52.09, 53.90
Very poor	59.6	57.88, 61.44	59.0	56.85, 61.22	59.4	58.07, 60.77
No information	30.1	18.10, 42.22	46.0	/	34.9	24.12, 45.82

greater impact) in the group with LBP. The exception is in health classification: participants who reported having very poor health and not having LBP showed worse levels of capacity and performance capacity and performance.

Among the sociodemographic variables, the profile of the population

with the greatest impact on capacity and on performance was: being female, older, having the lowest educational level, widowed, unemployed, with the worst income quintiles, and classify their own health as poor. Regarding the type of housing, worse capacity and performance occurred for those who lived in precarious accommodations made with

reused materials.

The respective adjusted ARMs and their 95 % CIs of variables associated with the worst capacity are as follows: LBP (1.77; 1.14, 1.21); female (1.12; 1.08, 1.16); age groups over 30 years old, being 30 to 50 years old (1.11; 1.05, 1.17), 50 to 65 years (1.34; 1.27, 1.41), 65 years and older (1.53; 1.45, 1.63); having worked for less than 1 hour in the last week (0.94; 0.90, 0.98); having incomplete primary education (0.83; 0.77, 0.90), complete primary education (0.79; 0.73, 0.87), incomplete secondary education (0.83; 0.76, 0.91), complete secondary education (0.77; 0.71, 0.84), incomplete higher education (0.82; 0.74, 0.91), graduated (0.79; 0.72, 0.86); considered health as good (1.56; 1.45, 1.67), regular (2.24; 2.09, 2.40), bad (2.65; 2.46, 2.86), very bad (2.75; 2.51, 3.00).

For the performance variable, the following ARMs and 95 % CIs of the variables were associated: LBP (1.15; 1.12, 1.17); female (1.08; 1.05, 1.11), age groups older than 30 years, being +30 to 50 years (1.05; 1.01, 1.10), + 50 to 65 years (1.11; 1.06, 1.16), + 65 years old (1.25; 1.19, 1.30); having incomplete primary education (0.92; 0.87, 0.97), complete primary education (0.87; 0.81, 0.92), incomplete secondary education (0.91; 0.85, 0.97), complete secondary education (0.84; 0.7, 0.90), incomplete higher education (0.88; 0.82, 0.95), graduated (0.86; 0.80, 0.93); consider health as good (1.46; 1.37, 1.55), regular (1.95; 1.83, 2.08), bad (2.13; 1.99, 2.28), very bad (2.21; 2.06, 2.38).

## Discussion

The prevalence of LBP in the population of Chile is 22.06 %, with greater values in the Metropolitan region, women, those aged between 30 and 50 years, with complete secondary education, married or in a stable union, who had worked in the last week, income quintiles II, living in a house, and considering health as regular. People with LBP have worse capacity and performance levels, hence worse levels of functioning compared to people without LBP. Moreover, being female, widowed, the older the age, the worse the level of education and income, and worse the health rating, worse the capacity and performance levels. Furthermore, there were significant associations between LBP and sociodemographic factors such as being female, older age, worse level of education, and poorer health rating, which were correlated with better mean values of both capacity and performance in the LBP population. Additionally, having engaged in work during the previous week was associated with decreased capacity values in the LBP population.

The prevalence of LBP in Chile exceeds the global rate reported in 2017 (7.5 %), with a higher prevalence observed in females (8.0 %). However, in contrast to the global population where the highest frequency is observed in individuals over 65 years old, the age distribution in the present study yielded different findings.<sup>21</sup> The prevalence data of the study, along with data from the National Health Survey in Brazil in 2018, showed that population with no education (25.6 %) with the highest prevalence of LBP and who reported having a poor or very poor health rating (43.9 %).<sup>22</sup>

The existing literature has already emphasized the importance of acknowledging the sociodemographic and economic context and the influence of personal beliefs and cultural factors on disability associated with LBP,<sup>23</sup> which aligns with the findings of this study. LBP is widely recognized as a debilitating health condition and a leading musculoskeletal cause of years lived with disability.<sup>5</sup> The results of the current study provide further evidence supporting this assertion, as individuals with LBP exhibited worse levels of capacity and performance.

Consistent with previous studies,<sup>24–26</sup> our findings also support a higher prevalence of LBP in women. Fehrmann et al.<sup>27</sup> observed a statistically significant difference between sexes in terms of domestic work, with women experiencing a greater impact. Additionally, limitations in social and recreational activities were more pronounced among younger men.<sup>27</sup> These results further underscore the influence of sex and age on the functioning implications of LBP. As age increases, both capacity and performance show better means, indicating greater activity limitations

and participation restrictions among older individuals. These findings align with the study by Fehrmann et al.<sup>27</sup> which also demonstrated that the population with LBP experiences greater difficulties in mobility, self-care, and walking as age increases. Similarly, a German study demonstrated a significant positive association between age and subjective disability in patients with LBP.<sup>28</sup> The aging process often involves neuromuscular and mechanical decline, which contributes to the loss or reduction of muscle strength and function. These factors can be intertwined with functional limitations and participation restrictions.<sup>29</sup>

Previous literature has already discussed the association between educational level and the prevalence of LBP, with lower education levels being linked to a higher prevalence of pain,<sup>16,30,31</sup> and serving as a predictor of poorer outcomes and prolonged pain episodes.<sup>22</sup> Most of the studies found present the correlation between a higher prevalence of LBP in individuals with lower education levels, however, they do not discuss the relationship between lower education and higher levels of disability. Our study revealed that those with lower education levels and LBP exhibited worse results in terms of capacity and performance. Lower levels of education can also be seen as an indicator of greater social vulnerability<sup>32</sup> and, are also associated with poorer working conditions, lower income and worse access to health care.<sup>33,34</sup>

In a population-based survey conducted in Canada, it was observed that individuals with lower education levels utilized fewer healthcare services for the treatment of back pain.<sup>35</sup> Corroborating with this finding, Romero et al.<sup>36</sup> examined data from the Brazilian National Health Survey and found that individuals with higher education levels were 2.39 times more likely to receive physical therapy treatment for back problems. These studies raise important considerations regarding whether reduced healthcare seeking barriers to access, and utilization that the population with lower education levels may encounter could lead to difficulties in performing activities and subsequent negative impacts on capacity and performance. On the other hand, it is important to emphasize that enhancing the educational level can help overcome barriers to accessing health services for the general population. Therefore, in the present study, individuals with lower levels of education may encounter more obstacles when trying to access health services.<sup>37</sup>

The relationship between work and health is intricate and multifaceted, and while evidence suggests that individuals in better job positions tend to have better overall health outcomes, there is a higher prevalence of LBP among unemployed individuals.<sup>38</sup> This complex association may be attributed to various factors, including difficulties faced by individuals with worse functional abilities in accessing employment opportunities or being exposed to unfavorable working conditions. Furthermore, theories propose that unemployment can lead to reduced income, potentially impacting healthcare access and quality of care.<sup>39</sup> Consistent with existing literature, our study findings indicate that unemployed individuals exhibited worse levels of capacity, thus supporting the notion that employment status is linked to functioning.

One notable limitation of our study is its reliance on secondary data, which may have inherent biases and limitations. The nature of the information regarding the presence of pain is self-reported, which could lead to distortion regarding the location of pain, as the survey does not provide a body map to illustrate the location. Additionally, participants could underestimate or overestimate pain due to inadequate understanding of the questions. It should also be noted that the study is aimed at the general population, not just those experiencing LBP. Another factor to consider is reverse causality; thus, it is not possible to establish a causal relationship between exposure and outcomes. Therefore, causal inferences were not made; rather, correlations were inferred. Another limitation is the use of 2015 data; however, the study provides important and novel information for the field. There are gaps in the literature regarding the association between functioning and sociodemographic factors in individuals with LBP. Furthermore, the survey uses an instrument that evaluates functioning based on the ICF, which is recommended and endorsed by the WHO, effectively capturing its complexity and the individuality of the population. It also includes a representative



sample from a middle-income country, which is another gap identified in the literature. Therefore, several noteworthy strengths of the study should be emphasized. First, our research employed a rigorous sampling methodology, ensuring a representative sample of the population of a middle-income country. This population-level perspective provides valuable insights into the prevalence and impact of LBP within a broader context. Furthermore, the utilization of participant-reported data allowed for a subjective assessment of individuals' own health conditions, capturing their personal experiences, restrictions, limitations, and potentialities. This approach contributes to a more comprehensive understanding of the lived experiences of individuals with LBP. Additionally, our study is one of the pioneering efforts to employ the MDS as recommended by the WHO to gather information. This standardized approach enhances the comparability and generalizability of our findings.

Moreover, the results of our research hold implications for health policy development, as they shed light on the health needs and functioning of the population. By moving beyond traditional morbidity and mortality indicators, our study provides valuable insights for policy-makers to design targeted interventions and allocate resources effectively, particularly in countries that prioritize health equity as a fundamental principle of their healthcare systems.<sup>35</sup> The perspective of physical therapy in primary care helps promote functioning and prevent disability, incorporating a biopsychosocial approach.

Identifying the profile of patients most affected and with the greatest impact on functioning can help guide actions by the government, universities, healthcare professionals, and civil society to assist in the management and prevention of LBP. These actions can include, for example, adapting effective interventions from other countries to minimize costs and demand for healthcare services, non-work-related absenteeism, and disability.<sup>40</sup> In the context of clinical assessment, studies indicate that social factors are not adequately evaluated in this setting, and the data from the present study demonstrate the need for these factors to be an important component of medical history.<sup>41</sup> By integrating this knowledge into clinical practice, physical therapists can better identify at-risk populations, tailor interventions to address the specific needs and barriers faced by different demographic groups, and implement more effective strategies for pain management and functioning recovery.

## Conclusion

There is a higher prevalence of LBP among specific sociodemographic groups, including females, aged 30-50, with complete secondary education, residing in metropolitan region, married or in stable unions, employed part-time, living in houses, and reporting regular health. The population with LBP exhibited significantly poorer levels of capacity and performance compared to those without LBP. Sex, age, education, and health status were associated with both capacity and performance, while health status alone influenced capacity values. These findings underscore the need for a comprehensive biopsychosocial analysis of LBP, considering sociodemographic factors, to inform targeted health policies and optimize healthcare planning.

## Declaration of competing interest

The authors declare no competing interest.

## Patient involvement statement

Not applicable.

## Data sharing statement

Data are available in a public, open access repository. II Estudio Nacional de la Discapacidad: <https://www.senadis.gob.cl/pag/356/16>

[25/base\\_de\\_datos.](#)

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