Ethnic disparities in self-reported health among older adults in Chile: the influence of stressful economic conditions

INTRODUCTION

Important ethnic disparities in health and mortality have been detected among older adults in Chile during the last decades (Minsal, 2006; Minsal, 2009; Minsal 2010; Minsal, 2011; Minsal, 2014; Sandoval et al., 2023; Sandoval et al., 2024, Sandoval and Alvear 2024b). For example, Sandoval et al., (2023) detected the existence of a 7-year differential in life expectancy at birth between indigenous and non-indigenous people in Chile. Additionally, Sandoval et al (2024) demonstrated that indigenous people not only expect to live a lower number of years compared to non-indigenous people, but also expect to live a lower proportion of disability-free time. Sandoval and Alvear (2024b) have demonstrated the existence of important ethnic differences in functional limitations in advanced ages, endorsed in 38% higher probabilities of functional limitations for the Mapuche in comparison with the non-indigenous, even controlling for socioeconomic conditions in childhood. This made it possible to elucidate the "long-range" effect of childhood conditions on ethnic-racial gaps in health.

On the other hand, it is known that -both in Chile and in other Latin American countries- indigenous people have worse economic conditions, including lower educational levels and higher poverty rates compared to non-indigenous people (Sandoval et al., 2024). . However, little has been explored on the link between stress linked to variations in socioeconomic conditions and the ethnic differential in health in the elderly.

In this context, the present work aims to determine the influence of stressful economic conditions on ethnic disparities in self-reported health among older adults in Chile. We believe that elucidating this may contribute to the generation of public policies aimed at reducing the health gaps associated with economic differences between indigenous and non-indigenous older adults in the country.

METHOD

The study used data from the Aging, Demographics, Ethnicity and Health Survey (EDES) which was applied in 2022 to a representative sample (n=885) of indigenous (Mapuche) and non-indigenous older adults aged 60 years and older in the Metropolitan and Araucanía regions of Chile. Both regions account for over 40% of the country's indigenous population. For the purposes of this study, a total sample of 813 older adults aged 60+ years is used, of which 382 (47%) are Mapuche.

The EDES is the first survey that considers a representative sample of indigenous and non-indigenous elderly in the country. The sample design of the EDES is complex and multistage.

Variables

The dependent variable corresponds to ***self-reported health***. The EDES includes the question How would you evaluate your current health? Considering five response categories 1) very good, 2) good, 3) fair, 4) bad and 5) very bad. For the purposes of the study, the options were grouped into two categories: 0) very good and good health and 1), fair, bad and poor health.

The key independent variable "***ethnic origin***" is a dichotomous variable: 1) Mapuche and 0) Non-Indigenous.

Sociodemographic factors: the variables **sex** (dichotomous variable 1. male: 0 female) and **age** (three decennial groups and one open group) are considered. In addition, the variable **education** (categorized as 1) 0-8 years, 2) 9-12 years and 3) 13 or more years) and **area** of residence (dichotomous variable 1) rural; 0) urban) are included.

Health Status: Two questions are included regarding health status. The first one corresponds to **chronic diseases**, categorized as 0) None, 2) one disease and 3) two or more diseases (multimorbidity). In addition, the **disability** variable was constructed according to the methodology suggested by Fuentes-García et al (2013). An older person without disability is defined as a person who has no problems in performing basic activities of daily life (ADL) (e.g. dressing, bathing, eating, toilet use, getting in and out of bed, walking) and with no difficulty or only one difficulty in instrumental activities of daily life (IADL) (e.g. shopping, doing housework, using the phone and looking up numbers, managing finances, managing medications). A disability state refers to having limitation in at least one ADL, in two or more IADL or a has score less than 21 on the Mini Mental State Examination (MMSE), previously validated in Chile (Quiroga et al., 2004) and greater than 5 points on the Pfeffer Functional Activities Questionnaire (PFAQ).

Stressful Economic Conditions: We considered three variables. The EDES includes a five-point scale which asks: Thinking back over the last year, how would you rate the ability of you and your household to meet all monthly expenses and bills? Use a scale of 1 to 5, where 1 is "no difficulty" and 5 is "a lot of difficulty"? From it we generated the variable **economic difficulty** in which responses were grouped into three categories 1) No economic difficulty 2) Medium difficulty, 3) High difficulty. Additionally, the EDES included the question Did you suffer any event or loss that affected your financial situation (loss of your own job, children, spouse, etc.) and the question Did a disaster occur that affected your home (e.g., earthquake, flood, fire, etc.). Both questions ask for the last two years prior to the survey (2020 and 2021). From them, dichotomous variables were constructed (1 yes and 0 No) referring to **Financial loss** and **Housing Damage**.

Analytical Strategy

To determine the influence of stressful economic conditions on the association between ethnicity and self-reported health, we estimated a series of five logistic regression models. The first model provides the degree to which ethnicity is associated with self-reported health controlled only for age and sex. In model 2 we add the variables education and area of residence. Model 3 incorporates health status variables referring to chronic diseases and disability. Model 4 incorporates the stressful economic conditions variables and, finally, model 5 includes the interactions between ethnic origin and each of the three economic stress variables. The aim is to elucidate whether the ethnic differential in self-reported health varies

according to stressful conditions. It should be noted that all models were estimated considering the sampling design (svy command in Stata).

RESULTS

Figure 1 (in appendix) clearly shows that ethnicity is associated with self-reported health among the elderly in Chile (X^2 p-values < 0.01). That is, indigenous people, in this case, the Mapuche, have a higher percentage of people self-reporting poor health compared to non-indigenous people.

[Figure 1]

Table 1 (also in the appendix) shows the results of the five regression models estimated. Model 1 shows that indigenous older adults in Chile are 49% more likely to report poorer health compared to non-indigenous adults [OR = 1.49; 95% CI 1.47-1.51; p-values < 0.001). Subsequently, in Model 2, when the variables schooling and area of residence are added, it can be observed that the differential decreases in relation to model 1, but the gap between indigenous and non-indigenous people continues to be important and significant [OR = 1.39; 95% CI 1.37-1.41; p-values < 0.001). In addition, there is an educational gradient in self-reported health, with those older persons with less schooling (0-8 years of age group) being 5 times more likely to report worse health than those with more schooling (13+ years of age group). It is also evident that people living in rural areas are 13% less likely to report poor health compared to those living in urban areas. It should be noted that a particularity of the Chilean indigenous population is that 80% of them live in urban areas.

[Table 1]

Both in model 3 when the variables referring to health status (chronic diseases and disability) are added, and in model 4 when the variables referring to stressful economic conditions are added, the ethnic differential in self-reported health remains practically identical in terms of size and significance. However, it is important to note that -as expected- those who report having multimorbidity (two or more diseases) and functional disability have a greater chance of reporting poor health (Model 3 and 4). In addition, those who report facing or having faced in the short-term situations of economic difficulty (stress) have a greater chance of reporting poorer health compared to those who did not experience situations of economic stress (Model 4).

Finally, model 5 incorporates the interactions between ethnicity and stressful socioeconomic conditions. The results allow us to verify that being indigenous and facing stressful economic situations increase the probability of reporting poorer health compared to those who are not indigenous and did not experience stressful socioeconomic conditions [OR = 1.92; 95% CI = 1.87-1.96, p-values < 0.001].

DISCUSSION

In this paper using data from the EDES, 2022 it has been determined that indigenous older adults are more likely to report poorer health compared to non-indigenous older adults. This is in line with the extensive literature describing an unfavorable situation in terms of health

and longevity for ethnic minorities (Anderson et al., 2016; Hayward and Heron, 1999; Hill et al., 2007; Montenegro and Stephens, 2006; Phillips et al, 2017; Sandoval et al., 2024). In addition, we corroborated that stressful economic situations at older ages are highly associated with the health of the elderly. It became evident that both indigenous and non-indigenous people facing stressful economic situations are more likely to report poorer health (model 4). However, the ethnicity-stressful economic situations intersection is highly detrimental to indigenous older people. In fact, it was found that when interactions were introduced, the ethnic differential in self-reported health increased compared to the other four models. This means that being indigenous and facing stressful economic situations are quite a marked "punishment" in terms of health for ethnic minorities. Health inequity that certainly requires urgent economic and health promotion measures.

According to the review carried out, this is the first study in Latin America focusing the analysis on the influence of stressful economic situations on ethnic differences in self-reported health. This makes it difficult to compare whether what has been detected in the Chilean case correlates with the reality experienced by other indigenous peoples in the region. However, the findings detected here are quite consistent with previous studies carried out with the EDES that demonstrate the marked ethnic-racial inequality existing in the health of Chilean elderly people.

In later stages, this study could explore other mechanisms that may be associated with a worse health report of indigenous people (e.g., childhood conditions).

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ANNEXES

Figure 1. Differences in self-reported health in Chilean older adults s (≥60 years) according to ethnic origin, 2022.

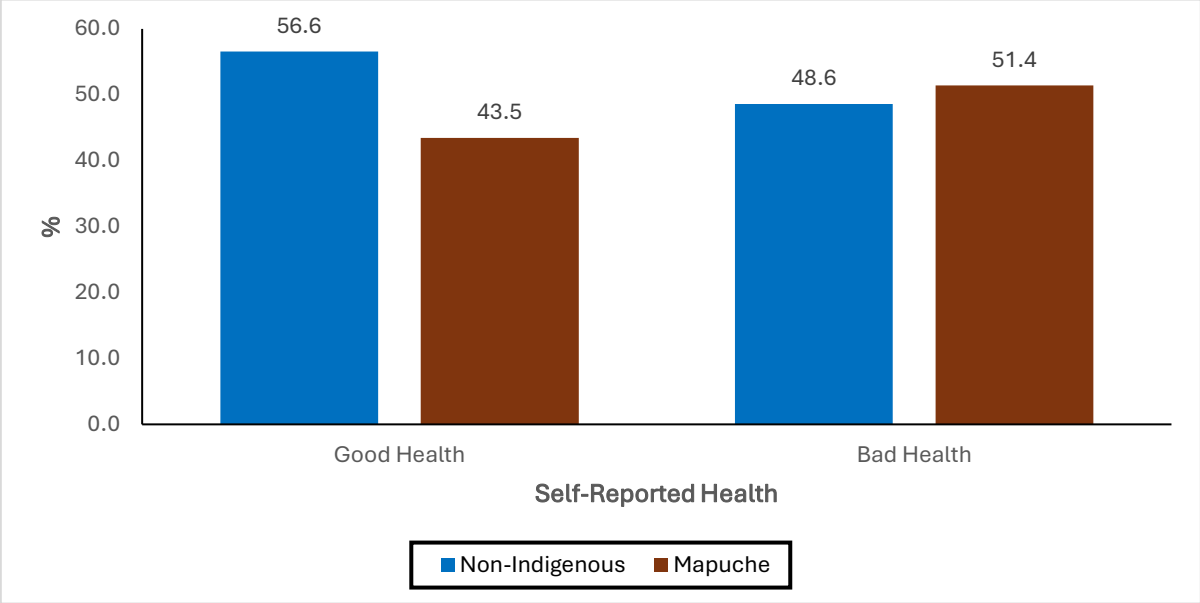

TABLE 1. Odd Ratios (OR) of association between ethnicity and self-reported health in older adults in Chile and of the influence of stressful economic conditions, 2022.

Variables	Model 1			Model 2			Model 3			Model 4			Model 5		
	OR	95% CI		OR	95% CI		OR	95% CI		OR	95% CI		OR	95% CI	
Ethnicity															
Non-Indigenous (ref.)	1.00			1.00			1.00			1.00			1.00		
Indigenous	1.49***	[1.47	1.51]	1.39***	[1.37	1.41]	1.28***	[1.26	1.29]	1.29***	[1.27	1.31]	1.92***	[1.87	1.96]
Sex															
Female (ref.)	1.00			1.00			1.00			1.00			1.00		
Male	0.77***	[0.77	0.78]	0.82***	[0.81	0.83]	1.49***	[1.48	1.50]	1.39***	[1.38	1.40]	1.39***	[1.37	1.40]
Age (decennal)															
60-69 years (ref.)				1.00			1.00			1.00			1.00		
70-79 years	0.85***	[0.84	0.85]	0.80***	[0.79	0.81]	0.56***	[0.56	0.57]	0.58***	[0.57	0.59]	0.58***	[0.57	0.58]
80-89 years	1.18***	[1.17	1.19]	1.04***	[1.03	1.05]	0.57***	[0.56	0.58]	0.60***	[0.60	0.61]	0.61***	[0.60	0.61]
90+ years	2.95***	[2.84	3.07]	3.17***	[3.05	3.30]	2.81***	[2.70	2.93]	1.98***	[1.90	2.07]	1.91***	[1.83	1.99]
Education															
0-8 years				5.26***	[5.15	5.38]	5.01***	[4.90	5.13]	5.66***	[5.51	5.81]	5.76***	[5.61	5.91]
9-12 years				3.02***	[2.95	3.09]	2.65***	[2.59	2.72]	3.70***	[3.60	3.80]	3.83***	[3.73	3.94]
13+ years (ref.)				1.00			1.00			1.00			1.00		
Area															
Urban (ref.)				1.00			1.00			1.00			1.00		
Rural				0.87***	[0.86	0.88]	0.60***	[0.59	0.61]	0.55***	[0.55	0.56]	0.54***	[0.54	0.55]
Chronic Diseases															
None (ref.)							1.00			1.00			1.00		
One Disease							4.83***	[4.76	4.90]	4.94***	[4.87	5.01]	4.95***	[4.88	5.02]
Two+ diseases							6.61***	[6.52	6.71]	6.62***	[6.52	6.72]	6.59***	[6.50	6.69]
Disability															
Without Disability (ref.)							1.00			1.00			1.00		
With Disability							3.92***	[3.89	3.96]	3.58***	[3.55	3.62]	3.58***	[3.54	3.61]
Economic Hardship															

No (ref.)						
Medium difficulty	3.06***	[3.03	3.09]	3.30***	[3.27	3.34]
High difficulty	2.33***	[2.31	2.36]	2.42***	[2.39	2.45]
Financial Loss						
No (ref.)	1.00			1.00		
Yes	2.14***	[2.09	2.18]	1.20***	[1.13	1.28]
Housing Damage						
No (ref.)	1.00			1.00		
Yes	1.46***	[1.44	1.49]	1.27***	[1.21	1.34]
Ethnicity#Economic Hardship						
Indigenous#Medium difficulty				0.48***	[0.46	0.49]
Indigenous#High difficulty				0.72***	[0.70	0.75]
Ethnicity#Financial Loss						
Non-Indigenous#Financial Loss				1.87***	[1.75	2.00]
Indigenous#Financial Loss				1.00	(omitted)	
Ethnicity# Housing Damage						
Non-Indigenous#Housing Damage				1.15***	[1.09	1.22]
Indigenous#Housing Damage				1.00	(omitted)	