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Strangers in Their Own World: Exploring the Relation Between Cultural Practices and the Health of Older Adults in Native Communities in Chile

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Abstract

In recent years, social gerontology has emphasised the concept of cultural diversity with the purpose of understanding how there is a differentiated ageing process in the life pathways of ethnic minorities. This study analyses the implications of Indigenous cultural practices for the health of a cross-sectional sample of 569 Indigenous Chileans (Aymara = 201 and Mapuche = 368) aged sixty and over. Measures were applied for depression, health problems, consumption of medication, cultural practices and resilience. The data analysis consisted of a linear and logistic regression analysis for scores on health-related measures. The results show significant differences amongst the Indigenous groups. Mapuche participants have more depressive symptomatology, more health problems and lower consumption of medication. There are differences in the explanatory variables for mental and physical health, but the results generally confirm that maintaining Indigenous medical practices, being resilient and engaging in intergenerational transmission of Indigenous culture are related with better health. These results suggest the need to incorporate an Indigenist and/or multicultural perspective into anti-oppressive social work practice by designing interventions and policies that help to maintain and perpetuate Indigenous health practices in community spaces.

Keywords: health, Indigenous practices, elderly people, Indigenous groups, resilience, native communities

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Health, well-being and their determinants involve highly significant and complex processes amongst the population in general, and particularly in the case of older adults. Recent literature concerning old age and health has emphasised the role of ethnic diversity (Cosco *et al.*, 2014; Lewis, 2011). In short, ethnicity is a key determinant of the ageing process, particularly in the case of ethnic minorities (Pace and Grenier, 2017). There is recognition that the multiple structural barriers affecting ethnic and racial minorities have a negative impact in old age (Cené *et al.*, 2016), suggesting the existence of an ethnic health gradient (Angel and Angel, 2006). This evidence typically relates to groups forming ethnic minorities in societies to which they are not Indigenous, generally as a result of migratory processes. Few studies have focused on ethnic groups that have become 'minorities' in their Indigenous territory. It is reasonable to hypothesise that the situation of potential exclusion may be aggravated when the existence of risks related with situations of 'historical injustice' is added to inequality. Paradoxically, the scarce available empirical evidence suggests that health and well-being amongst Indigenous persons are the result of a complex balance between risk and resilience (Pace and Grenier, 2017). In this context, it is reasonable to consider the role played by potentially protective intraethnic cultural factors (Lewis, 2011). The aim of this research was to analyse the relationship between older adults' cultural practices in native communities subject to processes of social inequality and various health indicators. Our study used a sample of ethnically Indigenous Aymara and Mapuche in Chile as described below.

Being Indigenous in Chile and its implications for the ageing process

The data show that 9 per cent of the Chilean population is Indigenous (1,585,680 people). Of these people, 83.8 per cent are Mapuche and 6.8 per cent are Aymara. Indigenous Chilean people have a disadvantaged social profile, including higher levels of illiteracy, lower income, poverty and marginalisation (Ministry of Social Development, 2015). This demonstrates that the process of citizen integration and recognition of Indigenous group identities remains an incomplete and ongoing task, particularly with relation to participation in social policy implementation (Gavilán, 2015). This process of exclusion takes place in the land of their ancestors, where Indigenous people have become strangers. Present

study analysed the Aymara and Mapuche ethnic groups, which are the most populous, remain resident in their native territories and endure conflict to a more or less explicit degree with the conventional institutions concerned with exploiting their natural resources on their ancestral lands.

In the case of health, few studies have examined the disadvantages faced by Indigenous people at advanced ages. These studies have produced contradictory results. Various studies have identified a situation of social vulnerability for older Indigenous adults. The available empirical evidence suggests the existence of risk factors such as increased burden from illness and mortality (Oyarce and Pedreros, 2007), greater dependence in the areas of mental and communicative functioning (Mella *et al.*, 2003), impairment of quality of life in terms of health (Vargas, 2014) and prevalence of depressive symptoms, mainly amongst women (Gallardo-Peralta *et al.*, 2015). On the other hand, a group of studies reported that cultural customs and traditions can act as protective resources and promote successful ageing (Gallardo-Peralta *et al.*, 2018). Indigenous older adults showed high levels of community participation through various cultural practices. Moreover, Wright (2015) claimed that Indigenous older adults of Aymara ethnicity are integrated into their community in social and work terms. This description reflects a system of social and economic organisation in the Aymara community that is inclusive for all family members in which older men and women actively participate in the social and symbolic reproduction of the community (Gavilán, 2002). The same thing applies in the Mapuche community. Older adults are valued for the knowledge they have attained in their lives; the community hence appreciates the guidance of older persons and actively integrates them into its symbolic and cultural reproduction (Mella *et al.*, 2003).

Health systems and cultural practices in the Andean communities of Chile

It is noteworthy that this apparently contradictory evidence refers to community and socio-structural factors; understanding it is hence fundamental for social work intervention. In Indigenous communities, effective social intervention can only be achieved in the medium- and long term through change-oriented actions in the unequal system in which the said communities are sited. To reduce the social gradient affecting the health of older adults, intervention necessarily entails change at institutional level by incorporating the cultural specificities of Indigenous communities.

The traditional health system of those Indigenous to Latin America is one of the most sophisticated and diverse in the world (Montenegro and

Stephens, 2006). From an Indigenous Andean perspective, health is harmony amongst the physical, mental and spiritual aspects of a person. This harmony encompasses environmental, sociocultural and natural aspects. For an Andean person, being healthy (*thani*) is a state of well-being, moral tranquillity and physical integrity (Flores-Guerrero, 2004). This process transcends the individual and becomes an experience that is constructed within a community—the Aymara *ayllu* and the Mapuche *lovche*—through interactions with family, neighbours, groups and even through interethnic relations. In recent decades, Indigenous Andean medicine has experienced a process of fragmentation and has been discredited due to the dominance of the Western health model (Guerrero, 1995). The Chilean health system is mixed. The private system operates through insurers who are highly selective in terms of who they ensure and are highly expensive. However, they represent the most efficient and immediate way of accessing specialist medicine. Although there have been notable advances in terms of the public system, selective assistance is provided through a co-pay system for those with incomes of 360 euros per month. Moreover, there are still limitations in terms of guaranteed access to medical assistance through the public system as a result of inadequately provisioned hospitals, a shortage of medical professionals specialising in geriatrics and the long waiting lists for surgical interventions.

In this context, anti-oppressive action by social workers requires the existence of empirical evidence, of which there was little at the time of performing this study. Specifically, the advocacy practice designed to reduce the social gradient affecting the health of older Andean adults involves the understanding of both the factors that affect their health and the pattern of relation amongst these factors. This aim requires the inclusion of practices that are reproduced, transmitted and make sense in community contexts. An example is knowledge of native plants or herbal medicines in Indigenous territories. It is an everyday responsibility of the community to classify, compose, use and protect these resources in their respective habitats (Flores-Guerrero, 2004). Additionally, Indigenous doctors (*Yatiri/Machi*) understand the various therapeutic practices involving medicinal plants that are used to relieve pain (Caroselli, 2013). Notwithstanding this, a tendency has been observed amongst Indigenous populations in the region to transition towards a health model that combines their traditional knowledge with the benefits of modern medicine (Montenegro and Stephens, 2006).

The maintenance and transmission of cultural practices in Indigenous groups ensures the prosperity and well-being of the community. This process of ethnocultural continuity is arguably especially important for ethnic minorities (Gezentsvey *et al.*, 2013). In our case, older adults become the bearers of a cultural tradition that promotes a lifestyle that is healthier and closer to nature and involves a high level of commitment

to the community (Pace and Grenier, 2017). A recent ethnographic study by Abonyi *et al.* (2016) amongst Indigenous rural communities in Canada reported that intergenerational legacy was associated with successful ageing and that this intergenerational transmission was mainly sustained by the grandparent–grandchild care bond.

The preceding literature review gives rise to a series of hypotheses:

> *H1*: Native cultural practices related with health and care in the case of illness (medicine) are positively related with the health levels of older adults. This positive relationship is not necessarily incompatible with the use of caregiving tools common to Western medicine.
>
> *H2*: The association between Indigenous practices and health will be maintained when other psycho-social processes are considered.
>
> *H3*: In addition to medicine-related practices, the intergenerational transmission of cultural heritage is expected to constitute a protective factor for health, particularly in terms of mental health.
>
> *H4*: The role of medicine-related practices (particularly allopathic) will vary based on ethnic origin (Mapuche/Aymara).

Methods

Participants

The sample was made up of 569 Indigenous Mapuche and Aymara older adults living in the north and south of Chile. Convenience sampling was used. Criteria for inclusion were being aged sixty or over, belonging to an Indigenous ethnicity and not suffering from serious cognitive deterioration. In order to obtain an appropriate level of structural representativeness in the selected sample in each of these territories, it was designed and stratified by sex, age, ethnicity and place of residence. One socio-economic feature common to Indigenous older adults is their low level of education. In quantitative terms, the main difference is whether they have completed primary school. We hence find a population with a low general literacy level, which was considered when designing the questionnaire and was decisive in choosing how to administer it. The features of the sample are set out in Table 1. These features are a faithful reflection of the population distribution according to the aforementioned variables.

Recruitment

Participants were contacted via two procedures. When possible and desirable, the research team made first contact directly and arranged an appointment to perform the interview. The rural enclaves have low

Table 1 Participants characteristics

Categories	Aymara ($n = 201$)	Mapuche ($n = 368$)	Overall sample ($n = 569$)
Gender			
Women	106 (53)	180 (49)	286 (50)
Men	95 (47)	188 (51)	283 (50)
Age groups			
60–69 years	97 (48)	162 (44)	259 (46)
70–79 years	75 (37)	134 (36)	209 (37)
≥80 years	29 (15)	72 (20)	101 (17)
Marital status			
Married/cohabiting	120 (60)	202 (55)	322 (57)
Single	23 (11)	54 (15)	77 (13)
Widow	45 (22)	96 (26)	141 (25)
Divorced or similar	13 (7)	16 (4)	29 (5)
Education			
Primary school incomplete	127 (63)	250 (68)	377 (66)
Primary school	49 (24)	76 (21)	125 (22)
High school or vocational education	21 (10)	39 (10)	60 (11)
Higher education	4 (3)	3 (1)	7 (1)
Residence			
North (region of Arica y Parinacota)	201 (100)	–	201 (35)
South (region of Araucanía)	–	368 (100)	368 (65)

Values are represented as *n* (%).

population density, meaning that contact with the older adult population was relatively straightforward. Some members of the research team (especially social workers) had enjoyed previous access to some communities from which participants were recruited, which enabled the technical team to obtain access without difficulty. When first contact entailed greater difficulty, it was made via key social agents, including council personnel (mainly social workers) and the most important neighbourhood and local leaders. These agents carried out an initial selection of participants based on the inclusion criteria. The experience and knowledge of the community of social agents contributed to a recruitment process that enabled the identification of persons with dementia (excluded from eligibility), for example. The interviewer attended the place indicated for the interview in both cases.

Procedure

A face-to-face interview method was used to collect the data. As such, the questionnaire was read out loud to interviewees. Qualified social work and psychology professionals administered the questionnaire. Interviewers learned to administer the questionnaire in a short training workshop; specifically, they received instructions on how to address potential difficulties with understanding questions, for which purpose

examples and even the linguistic meaning of some terms were provided. The main language used for the scales was Spanish. The native population uses Spanish on a daily basis as it is the dominant language in Chilean society. However, in an exclusively native interaction context such as that involving the Aymara and Mapuche populations, their own language is used. For this reason, the questionnaire included questions that use terms from the Indigenous language. For example, the Aymara terms *usu*, *thani* and *k'uyaña* and Mapuche terms (Mapudungun) *Kütrankülen*, *monguelen*, *chañiukëlen* were used to word 'I am unwell', 'health' and 'sadness', respectively. Indigenous people participated in the construction of the questionnaire in order to ensure that these Indigenous terms were properly used. Prior to the study, the questionnaire was administered to a total of twenty male and female older adults (ten Aymara and ten Mapuche), which facilitated the correction of the inaccuracies identified. This pilot study constituted a specific stage in the design of the present study.

The Ethics Committee of Tarapacá University and the National Council for Science and Technology of Chile approved and monitored the ethical aspects of the study. All procedures performed in studies involving human participants were in accordance with the 1964 Helsinki Declaration and its amendments or comparable ethical standards. Having first obtained the informed consent of participants, the data were processed confidentially and anonymously.

Measures

Health outcomes

Three outcomes were used to reflect the general and mental dimensions of health. First, 'depressive symptoms' were evaluated via the Geriatric Depression Scale (GDS) (Brink *et al.*, 1982). The selection of depression as the mental health indicator owes to its significance in understanding psychological well-being in the ageing process (Tapia-Muñoz *et al.*, 2015). The abbreviated version (GDS-SF, containing fifteen items) was used. This version maintains the effectiveness of the original scale, improving ease of administration. The instrument records the presence of fifteen symptoms of depression, with a resulting score from 0 to 15. Previous studies conducted in Chile used the GDS-SF, including studies carried out with native Indigenous minorities (Gallardo-Peralta *et al.*, 2015). The internal consistency index (Cronbach's alpha) for the questionnaire was 0.85, a value close to that obtained in previous research with Indigenous older adults (Gallardo-Peralta *et al.*, 2015).

Second, 'main health problems' were assessed using the Health Problems Questionnaire produced by Herrera *et al.* (2013). This

instrument was specifically developed to measure the most frequently occurring illnesses amongst the population of older persons in Chile, within the framework of the Chilean National Survey of Quality of Life in old age. It constitutes an inventory/checklist made up of fourteen pathologies: tension/hypertension, arthritis, high cholesterol, diabetes, cataracts, osteoporosis, heart problems, chronic lung disorders, stomach ulcers, asthma, fractured hip or femur, cancer, stroke or vascular disorders and Parkinson's disease. The sum of positive responses produced the final score. Cronbach's alpha for the questionnaire was 0.71. This measure has been previously used with Indigenous population in Chile (Gallardo-Peralta *et al.*, 2015).

Third, a question evaluated participants' consumption of medication, via the following: 'How many medicines do you take per day?' This question is associated with the diagnosis of illnesses and the respective medical treatment, and hence concerns medication prescribed by a doctor. The response categories were grouped into four items (don't take medication; one or two medicines; from three to five medicines; six or more medicines). For the data analysis, they were grouped into two categories (0, 'less than three medicines' and 1, 'three or more medicines').

Indigenous cultural practices

Given the importance of properly identifying the cultural practices related with health and medical care, a questionnaire was constructed that would differentiate between Indigenous medical practices and Western/conventional practices. This measure permitted the operationalisation of the concept of 'cultural practice-related medicine' (both native and allopathic), which is central to H1. Participants were asked whether they made use of certain tools or followed certain practices when ill. The first three (going to the Indigenous doctor, using Indigenous herbal medicines for ointments and massages, and preparation of Indigenous infusions) consisted of native Indigenous practices. The following two (going straight to hospital and being attended to by a private doctor, i.e. a specialist working in a private clinic) were allopathic practices. Finally, a sixth practice entailed use of an intercultural resource (attending a health centre). Implemented by the Chilean Ministry of Health, this resource was intended to combine the practices characteristic of Western medicine with cultural elements from Indigenous Chilean ethnicities, implementing the Chilean Indigenous Act (Law No. 19,253).

Given the importance that the existing literature attributes to intergenerational transmission of cultural practices for the well-being of persons belonging to an Indigenous ethnicity (including language, religious and medical practices, and productive and reproductive activities), this aspect was evaluated via two items: 'Do you transmit/have you

transmitted your indigenous practices to your children?' and 'Do you transmit/have you transmitted your indigenous practices to your grandchildren?' These items corresponded to the formulation of H3.

Five response categories (1 = never; 2 = rarely, 3 = sometimes, 4 = often and 5 = always) were used for questions relating to medical practices and cultural transmission. Responses were dichotomised, with a value of 0 if an individual answered never, rarely or sometimes, and a value of 1 if they reported often or always.

Resilience

The Brief Resilient Coping Scale (BRCS; Sinclair and Wallston, 2004) was used. The BRCS is composed of four items with five Likert-scale response categories. The questions are phrased as statements such as 'I believe that I can grow in positive ways by dealing with difficult situations.' Total scores range between 4 and 20. A total score equal to or lower than 13 would indicate low resilience, while scores equal to or higher than 17 would result in a classification of high resilience. The BRCS has not been validated for Indigenous populations. However, the available evidence has found the BRCS to be valid and reliable for Latin American older people (Caycho-Rodríguez *et al.*, 2018). Together with its brevity and the ease with which it is administered to older persons, this was the reason for its use in this research. Cronbach's alpha for the general questionnaire was 0.87. The use of the BRCS entailed the examination of the psycho-social processes involved in the formulation of H2.

Control variables

Indicators of the respondent's sex (1 = female), age, marital status (1 = with partner) and education (1 = completed primary education or higher) were included in all models.

Analysis

To test the study hypotheses, the data analysis was performed in two phases. First, bivariate descriptive analyses were conducted for the main study variables. Second, a hierarchical regression (ordinary least square) analysis was conducted for the measures of depression and health problems, on the one hand, and a logistical regression analysis for the analysis of the consumption of medication outcome variable, on the other. This analysis is based on six models. Model 1 considers ethnic affiliation, distinguishing between Aymara and Mapuche. This model represented the starting point for considering the association patterns of the other

predictors. Model 2 (cultural practices related with medicine, H1) incorporated the variables referring to medicine-related practices and medical care. This model considers the potential differences in the association pattern of type of practice (Indigenous, Western or intercultural) and health outcomes. Model 3 (relating to H2) incorporated the resilience variable in order to analyse the relationship amongst this form of coping, cultural approaches to health and ethnic affiliation. Model 4 (Indigenous intergenerational transmission, H3) incorporated the variables analysing efforts to transmit native cultural practices to children and grandchildren. Models 5 and 6 (designed to test H4) explored potential differences in the association between health and cultural practices and their patterns of intergenerational transmission depending on ethnic affiliation (Aymara and Mapuche). Both models examined the moderation effects including interaction terms in the equation. All the variables were included in each step using the 'Enter' method using the IBM-SPSS programme V23.

Results

Bivariate descriptive statistics

The results indicated statistically significant differences between the two Indigenous groups in terms of their health status and the maintaining of cultural practices. Table 2 shows that the Mapuche reported more depressive symptomatology and more health problems. The Aymara had higher consumption of medication (87 per cent versus 60 per cent). As regards cultural practices, the Aymara maintained their Indigenous medical practices to a greater extent: seeing Indigenous doctors (31 per cent versus 10 per cent), using natural herbs for treatment (54 per cent versus 14 per cent) and preparing infusions (54 per cent versus 28 per cent). In contrast, the Mapuche more frequently resorted to allopathic medicine when they feel unwell: attending family health centres (62 per cent versus 39 per cent), going to hospital (41 per cent versus 16 per cent) and seeing private doctors (7 per cent versus 4 per cent). Finally, the results showed that the Mapuche more frequently transmitted their cultural practices to their grandchildren (36 per cent versus 20 per cent).

Hypothesised models for health amongst Indigenous older adults

Depressive symptoms amongst Indigenous Chileans

The results (Table 3) show that the Mapuche reported more depressive symptoms. Of the various medical practices analysed, visiting an Indigenous doctor was associated with higher depression; to the

Table 2 Bivariate descriptive analyses of variables principals

Variables	Aymara	Mapuche	*t*-test (d.f.)	*p*-values
Depression, mean (SD)	2.66 (2.94)	3.73 (3.64)	−3.81 (567)	0.001***
Health problems, mean (SD)	1.04 (1.14)	1.96 (1.34)	8.20 (567)	0.001***
			Chi-square	*p*-values
Consumption of medication outcome (%)	87	60	44.067	0.001***
Medical practices (%)				
Seeing Indigenous doctors	31	10	37.785	0.001***
Using natural herbs for treatment	54	14	100.861	0.001***
Preparing infusions	54	28	38.289	0.001***
Attending family health centres	39	62	26.852	0.001***
Going to hospital	16	41	37.838	0.001***
Seeing private doctors	4	7	3.054	0.056*
Transmitted to their children	35	40	1.297	0.147
Transmitted to their grandchildren	20	36	15.178	0.001***

SD, standard deviation; d.f., degrees of freedom.
*$p < 0.05$; ***$p < 0.001$.

contrary, the use of Indigenous herbal medicines and infusions was associated with lower depression. Consultation of private doctors was also negatively associated with depression. The inclusion of resilience resulted in a substantial increase in the explanatory capacity of the model (model 2, $R^2 = 0.06$; model 3, $R^2 = 0.24$). Resilience also remained a predictive variable in all models, affirming that being resilient was negatively associated with the prevalence of depressive symptoms. These results support H1 (native medicine practices and health) and H2 (psycho-social processes). Both practices of transmitting Indigenous knowledge to family members were associated with depression, but in different directions: transmission to children had a positive association, while transmission to grandchildren had a negative one. This result partially confirms H3 (transmission of cultural heritage as protective factor). Finally, out of the various interactions analysed, it appears that the Mapuche who attend family health centres had more depression and the Aymara who transmit their knowledge to grandchildren scored lower for the depression variable. This result is at least partly consistent with H4 (interaction between practices and ethnic origin) (Figures 1 and 2). Models 2–4 and 6 were statistically significant; specifically, Model 6 represented an increase in its explanatory capacity with relation to depression, with 27.8 per cent of explained variance.

Health problems amongst Indigenous Chileans

The results (Table 4) show that being Mapuche, being a woman, being older and having completed primary education were associated with more health problems. Consumers of herbal medicines had fewer health problems. Those who attended hospitals had more health problems; in

Table 3 Summary of hierarchical multiple regression analyses to predict depression

Variables	*B* (SE) 1	*B* (SE) 2	*B* (SE) 3	*B* (SE) 4	*B* (SE) 5	*B* (SE) 6
Model 1. Control variables						
Gender	−0.225 (0.295)	−0.152 (0.291)	0.020 (0.262)	0.100 (0.261)	0.090 (0.262)	0.162 (0.262)
Age	0.017 (0.019)	0.018 (0.019)	−0.007 (0.017)	−0.005 (0.017)	−0.005 (0.017)	−0.002 (0.017)
Marital status	−0.199 (0.302)	−0.175 (0.297)	0.008 (0.268)	−0.043 (0.266)	−0.049 (0.266)	−0.034 (0.265)
Level of education	0.137 (0.320)	0.206 (0.315)	0.280 (0.284)	0.277 (0.281)	0.314 (0.284)	0.302 (0.283)
Monthly income	−0.002 (0.001)	0.000 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)
Indigenous group (0 = Mapuche; 1 = Aymara)	−0.976 (0.316)**	−0.967 (0.354)**	−1.013 (0.319)**	−1.194 (0.321)***	−1.073 (0.478)*	−1.239 (0.492)**
Model 2. Medical practices						
Indigenous doctors		1.522 (0.493)**	1.168 (0.446)**	1.161 (0.442)**	1.704 (0.736)	1.700 (0.732)*
Natural herbs for treatment		−0.373 (0.532)	−0.936 (0.482)*	−1.007 (0.478)*	−1.729 (0.672)**	−1.711 (0.669) **
Preparing infusions		−0.818 (0.398)*	−0.467 (0.360)	−0.275 (0.365)	−0.595 (0.404)	−0.438 (0.409)
Attending family health centres		−0.334 (0.339)	−0.246 (0.305)	−0.300 (0.304)	0.218 (0.385)	0.199 (0.383)
Attending hospital		0.572 (0.382)	0.627 (0.345)	0.642 (0.343)	0.445 (0.398)	0.433 (0.396)
Attending private doctors		−1.500 (0.652)*	−0.889 (0.590)	−0.817 (0.586)	−0.723 (0.654)	−0.710 (0.650)
Model 3. Resilience						
Resilience			−0.483 (0.042)***	−0.467 (0.042)***	−0.469 (0.042)***	−0.478 (0.042)***
Model 4. Cultural transmission practices						
Children				0.640 (0.345)	0.591 (0.350)	0.922 (0.415)**
Grandchildren				−1.285 (0.367)***	−1.153 (0.377)**	−1.787 (0.436)***
Model 5. Indigenous interaction and medical practices						
Indigenous × Indigenous doctors			−0.465 (0.938)	−0.278 (0.935)		
Indigenous × natural herbs					0.920 (1.416)	0.560 (1.414)
Indigenous × infusions					0.634 (1.265)	0.866 (1.274)
Indigenous × family health centres					−1.318 (0.638)*	−1.227 (0.637)*
Indigenous × hospital					0.297 (0.807)	0.154 (0.805)
Indigenous × private doctors					0.225 (1.429)	−0.001 (1.424)
Model 6. Indigenous interaction and cultural transmission practices						
Indigenous × children						−1.406 (0.770)
Indigenous × grandchildren						2.448 (0.858)**
R^2	.010	0.062	0.240	0.257	0.267	0.278
F-change	1.083	3.552**	129.624**	6.178***	1.331	4.070*

B, unstandardised regression coefficient; SE, robust standard errors in parentheses.
*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

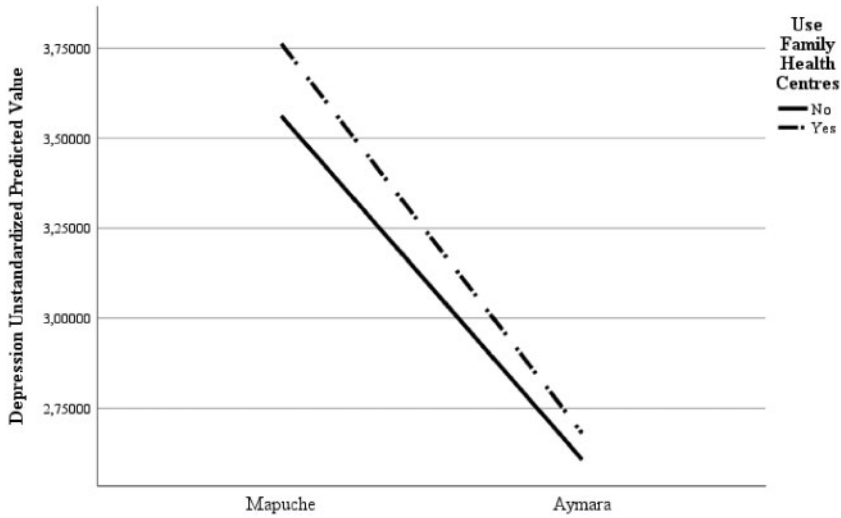

Figure 1: Plot showing the interaction between Indigenous group belonging and use of family health centres

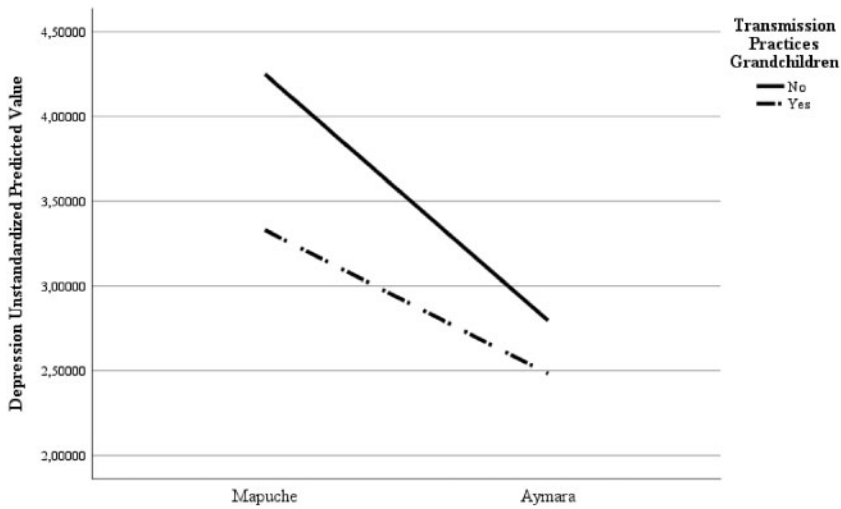

Figure 2: Plot showing the interaction between Indigenous group belonging and transmission of traditional practices to grandchildren

contrast, those who used private doctors had fewer problems. Though resilience was negatively associated with health problems ($b = -0.035$; $p < 0.05$), it only appeared in one of the models and its incorporation did not result in a substantial increase in the explanatory capacity of the model. Models 1–3 were statistically significant; the latest model

Table 4 Summary of hierarchical multiple regression analyses to predict health problems.

Variables	*B* (SE) 1	*B* (SE) 2	*B* (SE) 3	*B* (SE) 4	*B* (SE) 5	*B* (ET) 6
Model 1. Control variables						
Gender	0.053 (0.114)*	0.115 (0.105)	0.128 (0.105)	0.141 (0.106)	0.141 (0.107)	0.133 (0.108)
Age	0.020 (0.007)	0.018 (0.007)**	0.017 (0.007) **	0.017 (0.007)**	0.017 (0.007)**	0.017 (0.007)**
Marital status	0.094 (0.117)	0.094 (0.108)	0.107 (0.107)	0.098 (0.108)	0.099 (0.108)	0.097 (0.109)
Level of education	0.247 (0.124)	0.262 (0.114)*	0.268 (0.114)**	0.266 (0.114)*	0.259 (0.116)*	0.260 (0.116) *
Monthly income	−0.001 (0.000)	0.001 (0.000)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)
Indigenous group (0 = Mapuche; 1 = Aymara)	−0.914 (0.117)***	−0.699 (0.128)***	−0.703 (0.128)***	−0.732 (0.130)***	−0.775 (0.195)***	−0.749 (0.202)***
Model 2. Medical practices						
Indigenous doctors		0.241 (0.179)	0.215 (0.179)	0.211 (0.179)	0.362 (0.300)	0.364 (0.300)
Natural herbs for treatment		−0.168 (0.193)	−0.208 (0.193)	−0.222 (0.193)	−0.339 (0.274)	−0.344 (0.274)
Preparing infusions		−0.547 (0.144)***	−0.521 (0.144)***	−0.496 (0.147)***	−0.510 (0.165)**	−0.528 (0.168)**
Attending family Health centres		0.045 (0.123)	0.051 (0.122)	0.037 (0.123)	0.062 (0.157)	0.062 (0.157)
Attending hospital		0.331 (0.139)**	0.335 (0.138)**	0.332 (0.139)**	0.276 (0.162)	0.274 (0.162)
Attending private doctors		−0.599 (0.236)**	−0.555 (0.237)**	−0.540 (0.237)*	−0.514 (0.266)*	−0.515 (0.267)*
Model 3. Resilience						
Resilience			−0.035 (0.017)*	−0.032 (0.017)	−0.032 (0.017)	−0.031 (0.017)
Model 4. Cultural transmission practices						
Children			0.162 (0.140)	0.175 (0.142)	0.168 (0.170)	
Grandchildren				−0.236 (0.149)	−0.243 (0.154)	−0.190 (0.179)
Model 5. Indigenous interaction and medical practices						
Indigenous × Indigenous doctors				−0.225 (0.382)	−0.237 (0.384)	
Indigenous × natural herbs					0.247 (0.576)	0.272 (0.580)
Indigenous × infusions					−0.037 (0.515)	−0.038 (0.522)
Indigenous × family health centres					−0.048 (0.260)	−0.051 (0.261)
Indigenous × hospital					0.202 (0.329)	0.216 (0.330)
Indigenous × private doctors					−0.108 (0.582)	−0.094 (0.584)
Model 6. Indigenous interaction and cultural transmission practices						
Indigenous × children					0.054 (0.316)	
Indigenous × grandchildren						−0.200 (0.352)
R^2	0.026	0.193	0.199	0.203	0.204	0.204
F-change	3.050**	8.111***	4.176*	1.288	0.133	0.195

B, unstandardised regression coefficient; SE, robust standard errors in parentheses.,
*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

represented 20.4 per cent of explained variance for health problems. In summary, these results provide empirical support for H1 and H2, but not for H3 and H4.

Consumption of medication amongst Indigenous Chileans

Consumption of medication was positively associated with being of Aymara ethnicity, having completed primary education, higher income, use of herbal medicines for treatment, consumption of infusions (traditional herbal drinks) and attending hospital. These results (Table 5) are consistent with H1. Moreover, this association was maintained when incorporating resilience (H2), which showed a positive association with consumption of medication. The results do not support H3 as there was no association between consumption of medication and transmission of generational practices. The Aymara who attend family health centres consumed more medication; this is the sole moderation effect found (H4).

Discussion

It is important to note that the results obtained in our study are significant for the United Nations' 2030 Agenda for Sustainable Development, specifically in the context of Sustainable Development Goal (SDG) 3, which aims to ensure healthy lives and promote well-being for all at all ages. Understanding cultural patterns permits improvements to the design of social and health policies for Indigenous ethnic groups, a central element in achieving this SDG. In this context, the patterns of association between the outcome variables and the predictors included in our research show notable differences between mental health and the other health measures. The results obtained in the case of depressive symptoms clearly support H1 (native medicine-related practices and health) and H2 (psycho-social processes), and partially support H3 (transmission of cultural heritage as protective factor) and H4 (interaction between medicine-related practices and ethnic origin). These results suggest a significant role for health-related Indigenous cultural practices and for the intergenerational transmission of Indigenous practices. However, this pattern of association shows notable complexity. The use of herb-based medicines is related with lower incidence of depressive symptoms. This would suggest that this type of traditional medical practice reduces the appearance of depressive symptoms. However, the older adults who used Indigenous doctors reported a higher frequency of depressive symptoms. Along similar lines, our results suggest that only in the case of scores for the GDS-SF does intergenerational cultural transmission led by older adults represent a significant progress. Again, the pattern

Table 5 Summary of logistic regression analyses to predict medication consumption.

	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Model 1. Control variables						
Gender	0.950 (0.789–1.145)	0.913 (0.749–1.113)	0.901 (0.738–1.100)	0.888 (0.726–1.086)	0.900 (0.735–1.103)	0.901 (0.734–1.104)
Age	1.022 (0.997–1.047)	1.023 (0.997–1.050)	1.020 (0.993–1.047)	1.021 (0.994–1.048)	1.020 (0.993–1.048)	1.019 (0.992–1.047)
Marital status	0.854 (0.706–1.034)	0.846 (0.690–1.037)	0.831 (0.677–1.021)	0.835 (0.680–1.026)	0.837 (0.680–1.031)	0.838 (0.680–1.032)
Level of education	0.826 (0.674–1.011)	0.811 (0.653–1.007)*	0.804 (0.647–0.998)*	0.804 (0.647–1.000)*	0.779 (0.624–0.973)*	0.781 (0.625–0.976)*
Monthly income	0.994 (0.991–0.997)***	0.997 (0.994–1.000)*	0.997 (0.994 – 1.000)*	0.997 (0.994–1.000)*	0.996 (0.993–0.999)**	0.996 (0.993–1.000)*
Indigenous group (0 = Mapuche; 1 = Aymara)	1.933 (1.517–2.464)***	1.642 (1.260–2.139)***	1.655 (1.269–2.158)***	1.696 (1.295–2.222)***	164.285 (–)	171.755 (–)
Model 2. Medical practices						
Indigenous doctors		1.069 (0.699–1.636)	1.096 (0.714–1.682)	1.097 (0.714–1.686)	1.047 (0.650–1.685)	1.016 (0.628–1.643)
Natural herbs for treatment		1.148 (0.764–1.726)	1.182 (0.783–1.784)	1.186 (0.783–1.797)	1.858 (0.956–3.611)	1.969 (0.975–3.976)*
Preparing infusions		1.435 (1.101–1.870)**	1.401 (1.073–1.830)**	1.349 (1.024–1.778)*	0.882 (0.492–1.582)	0.821 (0.437–1.541)
Attending family health centres		0.999 (0.786–1.269)	0.988 (0.777–1.257)	0.992 (0.779–1.264)	1.315 (0.899–1.924)	1.316 (0.894–1.937)
Attending hospital		0.778 (0.606–1.001)*	0.775 (0.603–0.997)*	0.770 (0.597–0.993)*	0.591 (0.395–0.884)**	0.600 (0.398–0.906)**
Attending private doctors		1.399 (0.876–2.234)	1.355 (0.847–2.170)	1.354 (0.845–2.170)	124 .055 (–)	126.293 (–)
Model 3. Resilience						
Resilience			0.939 (0.881–1.001)*	0.941 (0.883–1.004)*	0.934 (0.876–0.997)*	0.935 (0.876–0.998)*
Model 4. Cultural transmission practices						
Children				0.960 (0.737–1.251)	0.953 (0.727–1.249)	1.147 (0.716–1.838)
Grandchildren				1.173 (0.886–1.555)	1.193 (0.894–1.592)	1.073 (0.637–1.807)
Model 5. Indigenous interaction and medical practices						
Indigenous × Indigenous doctors					0.964 (0.598–1.554)	0.987 (0.610–1.595)
Indigenous × natural herbs					0.577 (0.295–1.127)	0.548 (0.271–1.112)
Indigenous × infusions					1.559 (0.866–2.804)	1.687 (0.896–3.178)
Indigenous × family health centres					0.655 (0.447–0.959)*	0.658 (0.447–0.969)*
Indigenous × hospital					1.420 (0.952–2.119)	1.410 (0.936–2.124)
Model 6. Indigenous interaction and cultural transmission practices						
Indigenous × children						0.784 (0.489–1.256)
Indigenous × grandchildren						1.130 (0.670–1.905)
χ^2 Hosmer and Lemeshow	9.890***	7.109***	8.096***	9.892***	4.389***	3.400***
R^2 Nagelkerke	0.070	0.209	0.216	0.219	0.242	0.244

OR, odds ratio; CI, confidence intervals in parentheses.
*p <.05; **p <0.01; ***p < 0.001.

shows notable complexity: while the transmission of traditional cultural practices to grandchildren is associated with lower incidence of depressive symptoms (consistent with the study by Abonyi *et al.*, 2016), the relationship was reversed in the case of transmission to children.

It is indeed striking that visits to Indigenous doctors and the transmission of knowledge to children are positively associated with depression. Both relationships require theoretical and empirical investigation. In this respect, we can propose two lines of analysis. First, our results may suggest that a significant process of change is occurring within the Indigenous cultural system. This change may be influenced by the growing relevance of alternative religious and cultural patterns in the Indigenous context. In this regard, as Guerrero (1995) claims, the boom in Pentecostal religion and the figure of the 'minister' may be producing a break from and confrontation with Indigenous doctors by offering appealing alternatives to the role played by those doctors in Indigenous communities. Along the same lines, a rural family structure built around grandparents acting as carers for their grandchildren while their children live far away is becoming increasingly relevant. This adds a layer of complexity to a cultural legacy that is passed on face-to-face, making it difficult to maintain these practices in surroundings that do not offer the conditions necessary for the preservation of ethnic identity (Wittig, 2009).

Our results also suggest the significance of ethnic affiliation for the aforementioned processes (H4). It appears that the negative relation between depression scores and grandparent–grandchild cultural transmission is only applicable in the case of the Mapuche culture. This result may be explained by the greater role of older Mapuche adults in the primary socialisation process within the context of the extended family and due to their fundamental role as custodians of knowledge and carers for grandchildren in their community (Mella *et al.*, 2003).

Equally noteworthy is the existence of a significant interaction between specific ethnic affiliation (Aymara/Mapuche) and the use of family health centres. It should be observed that this moderation effect is only significant in the case of depression and consumption of medication variables. In order to explain these results, it should be recalled that the Indigenous populations are transitioning towards a combination of their traditional practices and the inclusion of allopathic medicine. In Chile, this process has been driven by public legal and political policies in favour of intercultural medicine, one of the main tools of which are the family health centres. Our results suggest that this strategy has not been uniformly effective if we compare Indigenous communities. As Gavilán *et al.* (2018) state, an intercultural approach to public health may have limited success as a consequence of failures to consider Indigenous health traditions and the demands of ethnic group leaders. These are fundamental elements in developing effective designs and implementation of

inclusive societies, by building effective, accountable and inclusive institutions at all levels (SDGs 16 and 9 in Agenda 2030).

Traditional and Western health-related practices: a reflection on the relationships amongst social exclusion, health-care system and resilience

As stated, there is a lower significance for Indigenous cultural practices and transmission of those practices in the case of health problems and consumption of medication. This conclusion is derived from our results supporting H1 and H2, but not H3 and only very partly H4. The consumption of infusions is certainly related with fewer illnesses. The importance of traditional knowledge of Indigenous medicine for health is hence clear. In this regard, as Madaleno and Delatorre-Herrea (2013) affirm, various native plants have a positive effect in the treatment of illnesses. For example, in traditional Aymara medicine diabetes is treated with native species, such as *culén*, mulberry and yareta flower. Notwithstanding this, our results suggest that Western medical practices are relevant to the health of participants in our study. The impact of allopathic practices on health cannot be ignored. Receiving attention in a hospital is related with more health problems and with higher consumption of medication; these findings are in line with the existing empirical evidence (Miller *et al.*, 1997). It is reasonable to analyse consumption of medication as a variable for self-care and promotion of health, particularly considering that the effectiveness of medical treatment (particularly for chronic illnesses) will depend on the level of adherence to the medication prescribed (Chodosh *et al.*, 2005).

It is possible to interpret the association between consumption of medication and use of private health care as elements that identify the importance of poverty and social exclusion in the health of Indigenous older adults. This reasoning emerges from the fact that paying for a consultation with a specialist private doctor and purchasing medication are closely related to socio-economic position in Chile. This points to a key aspect in the definition of sustainable development: the need to reduce social inequalities in all its forms and manifestations (SDG 10 in Agenda 2030). In this vein, health is vital in the definition of social inequalities and their effects in our societies, to the extent that these inequalities have been defined as fundamental causes of illness (Link and Phelan, 1995). Our results suggest that the social health gradient in the case of Indigenous communities manifests itself more strongly amongst older Mapuche adults. The Mapuche remain the Indigenous groups that have most resisted integration into the Chilean national system and maintain an active struggle to claim their ancestral lands (Pacheco, 2012). It is no surprise that their ethnic affiliation, in

confrontation with the economic and political model of the State of Chile, keeps them in a situation of social exclusion—particularly with reference to older adults.

Our results for the 'resilience' variable are consistent with the existing literature. Adaptability is undoubtedly a necessary skill in managing to age more successfully and healthily (Gu and Feng, 2018). Older adults who make use of their resilience strategies are capable of perceiving their own resources and strengths and hence of handling adverse situations that they may encounter on a day-to-day basis (Mayordomo *et al.*, 2016). From a community perspective, Pace and Grenier (2017, p. 253) affirm that 'resilience is considered to be strongly connected to the maintenance and restoration of indigenous cultural values, the empowerment of older people, and engagement in meaningful roles'. In any event, it is worth noting that the introduction of resilience in an explanatory model of health amongst Indigenous people does not explain the potential effect of traditional/Indigenous cultural practices. It is possible to argue that being resilient at advanced ages consists of achieving a balance between losses and gains, the latter being linked to wisdom, experience and the richness of a community support system (Hayman *et al.*, 2017). From this perspective, resilience is a psychosociological resource whose explanatory role plays out in the context of social, economic and political structures that do not favour continuity of the cosmovision of Indigenous cultures. It seems reasonable to argue that allied with resilience, traditional cultural practices are conceptually different mechanisms for the protection of health in the case of these ethnic groups within a context of structural hostility (Olivi, 2011).

Limitations and implications for social work

The cross-sectional design invites a cautious interpretation of the potential existence of causal relationships. The interest of our analytical framework was to explore the potential impact of Indigenous practices on health, but to be able to identify the existence and direction of causal relationships, it is necessary to design longitudinal research. In any case, our study offers evidence in a relatively recently developed theoretical and empirical context, with significance for the scientific literature on ageing in the field of social sciences.

In the context of these limitations, the debate on the applicability of these data in socio-health-care interventions may be approached from an Indigenist or an intercultural perspective. An Indigenist approach may be more respectful of and coherent with the Indigenous cosmovision and would clearly be more representative of feelings of ethnic identity, but it runs the risk of increasing the social exclusion gap affecting these groups. In other words, this differentiation in the health-care model

could place the Indigenous community in a situation that is even further removed from the health patterns of non-Indigenous people, with consequences such as relatively shorter life expectancies. An intercultural model should be just as respectful and appeal to cultural reciprocity, equality and interdependence, but always runs the risk of seeking to homogenise the health-care model. Moving beyond this debate on the most suitable approach, one may argue that both approaches are certainly necessary and they are not mutually exclusive. The criteria that should guide interventions with ethnic minorities are understanding heterogeneity, respecting differences in life choices and appealing for positive discrimination on behalf of those excluded from the system. Social workers can be agents in this process of change, the aim of which should be to eliminate situations of exclusion by securing the integrity of Indigenous cultures. This action may include legal and legislative advocacy, system advocacy and guidance/support for policy and institutional change. In particular, it is proposed to design a diversity management system that incorporates ethnic/Indigenous health-related practices in health-care contexts (especially in health centres and hospitals).

This study was designed by an inter-disciplinary team led by social workers; the intention was to adopt a perspective that was holistic and respectful of the well-being (*suma qamaña* and *küme mongen*) of Indigenous Chileans. There is a need within social work to assess the impact of allopathic and Indigenous medical practices, as this age group has been observed as tending to combine both practices. The Indigenous community in Chile, and particularly older adults, asks social workers to transmit, maintain and perpetuate Indigenous practices in community spaces (associations, neighbourhood meetings, social programmes and health centres). Observing this reality means the identification of study objects for a social work that is contextual, critical and close to the reality of groups at risk of exclusion. The challenge for social work research is to make progress on research models with and involving Indigenous older adults, with the inclusion of Indigenous social workers being of particular importance. The Indigenous research paradigm (Pidgeon, 2018) is of note in this regard. This model attempts to represent Indigenous diversity in a research process based on the cultural knowledge, values and features of these social groups—all of this while resolutely incorporating the fact that inequality and unfairness in terms of Indigenous access to health care remains an unresolved issue.

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