Employment status among individuals afflicted by acquired brain injury: exploring economic consequences for both the affected person and their family

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ABSTRACT

Background: Acquired Brain Injuries (ABI) are conditions that can result in decreased workforce engagement and economic earnings. This research study aims to explore the impact of ABIs on employability, and their potential to reduce individual and family income. Method: Using data from the II National Survey on Disability, a cohort of 9,835 individuals aged 18 to 65 was chosen. Subsequently, a sample of 110 ABI-affected individuals was selected, employing propensity score matching to ensure equivalence with a control group of healthy subjects (n = 110). Results: The study found that the presence of ABI and disability decrease the likelihood of employment and labour force engagement. These differences persist even after accounting for covariate effects. However, no conclusive predictive association was established regarding individual and family income levels, despite observed disparities across the analysed groups. Discussion: The obtained findings can contribute to raising awareness regarding the general employment situation of individuals with ABI, and facilitate policy-making in the context of inclusion and vocational rehabilitation initiatives.

KEY WORDS

Employment status, Employment, Labour market, Economic income, Indirect costs, Acquired Brain Injury, Disability,

Background

Acquired Brain Injuries (ABI) encompass a spectrum of neurological disorders that entail both direct physical impairment to the brain and a range of secondary consequences derived from the underlying pathology (Entwistle & Newby, 2013). They are a global health challenge, as evidenced by their prevalence, impact on quality of life, associated disabilities, economic costs and complexities involved in helping individuals to return to productive activities (Ma et al., 2014).

In the year 2019, neurological disorders accounted for 11.6% of the total burden of reported diseases (GBD, 2019). Among these conditions, 40% of the burden is ascribed to cerebrovascular diseases (Vos et al., 2020), while 12% is associated with traumatic brain injuries (TBI) within the adult working-age population. Furthermore, these two conditions rank among the primary contributors to global disability (Frost et al., 2013). In Chile there are no epidemiological studies on ABI, local reports have estimated that the incidence rate for TBI is 200 per 100,000 inhabitants per year (Ortiz, 2006), while the rate for strokes is approximately 121.7 per 100,000 inhabitants (DEIS, 2020; Lavados et al., 2021).

These conditions typically alter a broad range of motor, cognitive, and socio-emotional functions, leading to a subsequent decline in activities of daily living and social engagement. One of the paramount issues arising from this is the substantial loss of productivity (Buunk et al., 2019).

Reduced labour market engagement, challenges in job acquisition or return into prior positions, and decreased workforce participation are potential manifestations of diminished post-ABI productivity (Doctor et al., 2005). The average rate of return into the labour market among people who suffered a TBI is 40.7% (Velzen et al., 2009). Nevertheless, those who do manage to re-enter the workforce face notable job instability, evident from early stages (Ponsford & Spitz, 2015; Benedictus et al., 2010), persisting after five or more years (Marchamer et al., 2007).

Research focused on individuals with ABI has sought to ascertain the influence of different predictors and their associations with the risk of unemployment (Ownsworth & McKenna, 2004). Unemployment risk has been found to be associated with sociodemographic variables (DiSanto et al., 2019), including lower re-employment rates for women compared to men (Doctor et al., 2005); individuals over 40 having higher rates of unemployment (Keyser-Marcus et al., 2002); and people with lower educational levels, or who have not completed secondary education, showing reduced prospects of being employed (Kreutzer et al., 2003). Similar patterns have been noted concerning socioeconomic status and rural-urban distinctions (Brown et al., 2019). Variables associated with the condition have also been identified, and the degree of disability is a significant factor predicting employment (Ownsworth & McKenna, 2004)..

The return into the workforce is one of the most significant variables in the post-ABI recovery process (Dawson et al., 2007). Evidence has shown an association between return into the workforce and elevated levels of self-esteem, quality of life, and subjective well-being (Kreutzer et al., 2003). Furthermore, it has been noted that disruptions in employment status can lead to social withdrawal, depression, reduced motivation, and compromised financial independence (Sigaki et al., 2009).

In Chile there is only one observational study that has shed light on this problem in people with TBI (n = 202). The findings from that study revealed that return into the workforce stood at 53.5%, 55.6%, and 69% after two, five, and 10 years of progression, respectively (Franulic et al., 2004). But there is a lack of official statistics to ascertain the circumstances and employment conditions experienced by individuals who have acquired a disability stemming from an ABI. Although the Chilean government introduced the II National Survey on Disability (II ENDISC) to measure the prevalence of disability and outline the living conditions of individuals with disabilities (SENADIS, 2016), this tool does not provide specific information regarding the population with ABI.

The economic ramifications associated with the consequences of an ABI have been documented as substantial and enduring (Shames et al., 2007), stemming from direct and indirect costs that the disease entails (Koopmanschap & Rutten, 1993). Direct costs include expenses arising from the use of medical and non-medical resources for the care of individuals affected by ABI. Indirect costs refer to secondary losses resulting from consequences of the condition, such as job loss, decreased work productivity, legal expenses, or the inability of a family member to work while they are looking after the individual with ABI. Research studies addressing the cost implications of ABIs have mainly focused on direct expenditures (Humphreys et al., 2013). In this context, a notable contribution is the study conducted by Johnstone et al. (2003), which projected a national economic loss of $1,076 million in the United States as a result of not returning to work after one year. This present study seeks to address this gap by exploring the relationship between productive engagement and economic earnings (such as income decrease or monetary income), serving as an indicator for the indirect costs associated with the condition.

ABIs can also cause economic hardship for the families of those affected, considered an indirect cost. This has been reported mainly in countries where there is funding for families who provide their members with health services (Nguyen et al., 2014). It has been documented that approximately 84% of households with one member who has ABI incurred substantial treatment-related costs, consequently resulting in financial hardship for both the patient and their family (Hoang et al., 2008). According to the study carried out by Thang et al. (2015), individuals who experience sequelae from traffic accidents are 1.8 times more likely to encounter to family impoverishment.

Based on the above, this research study aims to explore the impact of ABIs on employability, and their potential to reduce individual and family income. For this, data from the II National Survey on Disability was analysed, with the specific objectives of: 1) describing the employment status of people with ABI in Chile, 2) estimating whether the presence of an ABI negatively affects their chances of finding employment; 3) determining whether the presence of an ABI affects individual and family income levels.

Methodology

Sampling

The present study used data from the II National Survey on Disability (II ENDISC) carried out nationwide in 2015. The original study looked at the total number of adult subjects registered in the II National Study on Disability, (n = 12,265 households). The sample design of the original study was probabilistic and biphasic. The survey was distributed among a sample that covered residents in private homes in both urban and rural regions of 135 municipalities, spanning all 15 regions in Chile. Data collection took place from June to September 2015, involving interviews with adults (18 or older) as well as minors. The estimated percentage of adults with disabilities carries an absolute error of 1.1 percentage points.

The sampling methodology of the study concurs with the criteria from the original research. A sample of 9,832 subjects was selected, corresponding to all individuals of working age between 18 and 65 (see Table 1). Subsequently, people who reported having suffered a stroke or TBI (n = 110) were selected. On the other hand, a control sample was selected (n = 110), and matched using the propensity score matching technique. This group was made up of people who neither reported current afflictions nor had a history of disease according to the survey.

- Insertar Tabla 1-

Instrument

Based on the World Health Organisation Model Disability Survey directives, the II ENDISC is composed of three distinct questionnaires: household, adult, and children (SENADIS, 2016). Only information from the first two questionnaires was used for this study. The household questionnaire collected data regarding: a) *socioeconomic characteristics of the household* (sex, age and area of residence); b) *education* (highest educational level attained by the respondents); c) *employment* (work activity during the past week, performance of activities, temporary work interruptions, past work experience, work availability, reasons for work absence); d) *income* (self-employed, individual and family). Disability was measured using the Capacity and Performance scales that are part of the adult questionnaire. Disability level was calculated using the approach outlined in the II ENDISC methodology, as proposed by SENADIS (2016). The instrument allows grading the disability according to the scores obtained in the performance scale in three ranges: no disability, mild-moderate and severe.

Data analysis

Using the data described in the previous section, the following variables were formulated: percentage rates of employment activity status (employed, unemployed and not active); labour force (sum of employed and unemployed); employment participation in the labour force (labour force divided by the sum of the labour force and the not active people population) and unemployment (unemployed divided by the labour force). These variables adhered to the guidelines stipulated by the institution responsible for the study (SENADIS, 2016).

Regarding objective 1 (employment status of individuals with ABI), descriptive statistical analyses were conducted for all variables, enabling a comparison between those with ABI and the remaining sample. Parametric and non-parametric hypothesis tests, grounded in bivariate comparisons, were used. To analyse categorical data, the χ^2 independence test and Fisher's exact test were used, based on the requisite conditions. For continuous data, either Student's t-test or the Mann-Whitney U test were applied. When analysing individual income levels, only employed individuals were considered. This criterion was also maintained when performing regression analyses.

To address objective 2 (assessing the negative impact of ABI on employment status), the ABI group was matched with a healthy control group (No-ABI-SMP) based on age, gender, rural/urban status, education level, and income quintile using the Propensity Score Matching technique (Garrido et al., 2014). This technique facilitated optimal matching based on variables that could potentially have a mediating effect with the variable of interest (employment status or income), with an aim to minimising intergroup differences. Control group exclusion was determined by the presence of the following disease groups: physical/motor, neurodevelopmental, neurological, chronic, and mental health conditions. The level of associated disability was not included in this procedure to explore the potential influence of this variable on employment and economic income. Effective matching was attained, yielding a standardised overall mean reduction across covariates ranging from 0.09 to 0. Based on the above, we obtained the No-ABI-SMP group consisting of 110 people (see Table 2). We subsequently built binary logistic regression models to test what type of variables can correctly classify employment/unemployment rates. The predictor variables were the presence or absence of an ABI and the degree of disability. We decided to dichotomise the employment status variable (works vs does not work). The working group comprised individuals who reported being employed. The non-working group included those who were unemployed as well as those who are not actively employed due to disability or were receiving a disability pension. In these models, the significance of standardised coefficients was taken into account to assess the which predictors were more relevant to the outcome variables. All variables were evaluated to determine whether they fit the criteria and assumptions of the multivariate models. Furthermore, we analysed the data to ascertain the presence of multicollinearity.

Regarding objective 3 (assessing the impact of ABI on individual and family income levels), multiple regression models were constructed to evaluate the influence of employment status on income levels. These models aimed to demonstrate whether the presence of an ABI and the associated disability negatively affected individual and family income levels.

-Insert table 2-

Results

General Results

Data derived from the II ENDISC indicate that approximately 1% of the population reports experiencing an ABI (n = 110 individuals), of which 67.27% (n = 74) are attributed to cerebrovascular accidents. Extrapolating this data to the population level allows us to estimate that the prevalence of ABI in Chile is approximately 107,820 people. Approximately 65% of this population are female, more than two thirds are over 45 and 82% have less than 12 years of schooling. Among the complete ABI sample (n = 110), 50% have a disability, and of them 27% are categorised as severe. These statistics contrast significantly with the values observed in the general working population, where disability rates stand at approximately 16% (see Table 3).

-Insert table 3-

Labour participation and unemployment

In regard to activity status (employed, unemployed, and not active), distinctions emerge when comparing individuals who have experienced an ABI with No-ABI individuals who are working. Approximately 55.5% of the people who have suffered an ABI reported that they are working, marking a notable disparity from the 67.6% of those unaffected by this condition (refer to Table 3).

Labour participation was significantly lower ($\chi^2_{(1)} = 5.008$, $p = .025$) for people who suffered an ABI compared to No-ABI (62.7% vs 72.3%) . This discrepancy was influenced by sex, age, and educational variables, with males, older individuals, and those with less education constituting the most affected groups, since this disparity was not significant in the No-ABI-SMP group ($\chi^2_{(1)} = 3.017$, $p = .085$). While there is a disparity in unemployment rates between ABI and No-ABI (11.6% vs 6.6%), this distinction lacks statistical significance ($\chi^2_{(1)} = 2{,}744$, $p = .098$), which is maintained in the No-ABI-SMP group ($\chi^2_{(1)} = 3.141$, $p = .065$). When analysing unemployment, it becomes obvious that the men group (16.1%) has the highest unemployment rates (see Table 4 and 5).

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Among the individuals with ABI who are not working, 53.7% (22) reported they were not working because of their disability, while 12.3% (5) cited early retirement before age 65. In contrast, among individuals who do not have an ABI, the predominant reasons for inactivity included engagement in household tasks (n = 720, 26.6%) or that they were studying (N = 591, 22%).

ABI as a predictor of employment status

This analysis was performed between ABI and No-ABI-SMP. The findings indicate the statistical significance of the regression model, where ABI (p = .013) and disability level (p = .001) as predictor variables account for 22.8% of variance and yield a model classification rate of 79.9% (see Table 6). Furthermore, the model's fit was found to be satisfactory according to the Hosmer and Lemeshow test ($X^2_{(3)} = 1.477$, $p = .694$). The regression model performed showed that having an ABI raises the likelihood of unemployment by a factor of 2.8. Similarly, mild disability increases the possibility by 5.5 and a severe one by 4.8. Thus, the results show that the presence of ABI, along with the corresponding degree of disability, emerges as a substantial predictor of individuals' employment status. This holds true even when accounting for the influence of covariates, as evidenced by the formation of a No-ABI-SMP group characterised by similar sociodemographic attributes as the target group.

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ABI as a predictor of individual and family income

The median individual income level of people with ABI does not exhibit statistically significant differences in comparison to the No-ABI group (t(6.624) = -1.517, p > .05). This is also maintained when controlling for sex, education, age, income quintile, and disability in the No-ABI-SMP ($t(148) = 0.208$, $p > .05$). However, 73.8% of ABI-afflicted workers earn less than 300,000 pesos per month, contrasting with 49.6% of the broader population at the same income level. This figure is higher when specifically analysed for the female group, where 82.9% receive a salary of less than 300,000 pesos. Consequently, the wage disparity between workers with and without ABI amounts to 130,659 thousand pesos, a difference of 38.9%; a difference that is 20% when compared according to sex.

In contrast, distinctions emerge in terms of family-level income when individuals report having experienced an ABI ($\chi^2(118, 729430) = -4.751758$, $p < .001$). These differences remain unaffected by sex, area of residence, employment status, and the age of the person affected, but not by education levels, presence of disability and the income quintile to which they belong. Within families where a member has an ABI, 55.5% receive a monthly income below 500,000 pesos, contrasting with 48.2% in families without ABI. Furthermore, a significant 39.5% disparity in family income exists between individuals with and without ABI. In the context of individual income levels ($R^2 = .012$; $F(2) = 1.870$, $p = .158$) and family income ($R^2 = .008$; $F(2) = 1.836$, $p = .162$), the multiple regression models did not show a significant association with the presence of one ABI and the degree of disability.

Discussion

The existing literature has provided ample scientific evidence illustrating how ABIs reduce the likelihood of employment (Mani et al., 2017), resulting in a decline in both individual and family economic income (Johnstone, Mount & Schopp, 2003). Chile does not have official statistics that could facilitate the assessment of the circumstances and working conditions of people who have suffered an ABI. Nor of the economic impact. Which is why the objective of this study was to explore the employment status of people with ABI and assess the individual and family economic impact, using data from the ENDISC II survey. The primary finding of the study underscores that the presence of an ABI and associated disability decreases the likelihood of employment for both genders. Our results concur with findings in the scientific literature, especially in that a notable portion of individuals who have an ABI do not return into their previous work roles (van Velzen et al., 2009), a situation that is partly determined by demographic variables, as noted by previous studies (Arango-Lasprilla et al., 2020; DiSanto et al., 2019). Moreover, a substantial proportion of individuals who have experienced ABI are not included in the workforce because of their condition (Graff et al., 2019).

Regarding work participation, a noteworthy decrease was seen among individuals with ABI, particularly impacting males, older individuals, and those with lower educational attainment. In addition, unemployment rates are also higher in men who have suffered an ABI. On the other hand, the data indicated that a substantial proportion (66%) of individuals were excluded from the labour force, primarily due to disability or early retirement (in contrast to the 24% seen in the comparison group and general population). These data show a group of people who had to leave their jobs because of their ABI. An additional point for consideration is the innovative methodology used in the study to determine the influence of ABI and disability on employment status. In this context, by employing propensity score matching, a direct effect was found between suffering an injury, the extent of associated disability, and the likelihood of being employed. This relationship is independent of demographic variables. Finally, owing to the nature of the ENDISC, the data obtained by this study could be generalised to the Chilean ABI population, thereby contributing to limited existing evidence.

Nevertheless, our findings regarding the effect of ABIs (and disability) on received income levels do not concur with the existing literature. This discrepancy exists even though other studies have demonstrated such a correlation, as seen in the case of individuals who have experienced a TBI (Arango et al., 2022; Johnstone et al., 2003). This could be attributed in part to the focus on only monthly income from the individual's main job; other sources of income, such as secondary employment, earnings from family businesses, or retirement/pension benefits, were not included in the analysis.

Methodological limitations of the ENDISC II

The results from this study need to be interpreted cautiously, considering the constraints stemming from the design of the ENDISC II survey. First, the data provided by ENDISC II lacks information regarding the time that has elapsed since the date the ABI occurred, and how this has impacted on employment status. Second, the findings might be affected by the presence of comorbidities and pre-existing conditions, factors beyond our control due to unavailability of such information in the survey. Third, the cross-sectional and aggregated approach of the study offers restricted insights into the disease's recovery and rehabilitation, lacking the capacity to track the progression from acute to chronic phases. Fourth, the data derived from the survey relies on self-reports from the interviewees, who may not necessarily be the individuals directly affected by ABI. This introduces potential variability and inaccuracies in the information collected. This issue becomes particularly relevant, given that a prevalent and enduring symptom among individuals with ABI is a lack of awareness regarding their own condition (Hart et al., 2008). Lastly, essential data such as pre-existing physical and mental health records, prior employment status, age at onset of the disease, severity, duration of hospitalisation, recovery progress, and outcomes remain unattainable. These aforementioned limitations have been acknowledged in previous studies as shortcomings that emerge from the absence of a robust information recording system, impeding informed decision-making in public health (Schmidt et al., 2015).

Based on the above, the establishment of a centralised national registry for individuals with ABI within the Chilean healthcare system is essential. This registry should facilitate the integration of data from both public and private healthcare providers across all stages of the condition (acute, subacute, and chronic). An example of such an initiative is the North American registration system called *Traumatic Brain Injury Model System National Database* (Tso et al., 2021). This database is a prospective and multicentre longitudinal research programme established by the *National Institute on Disability, Independent Living and Rehabilitation Research* (NIDILRR) group for monitoring people who have suffered head injuries. This system aims to examine the trajectory of recovery and disease outcomes following patient rehabilitation. It also plays a fundamental role in the development of treatment strategies and research. To address these aims, the system gathers data on injury and hospitalisation, the patient's health status (both pre-existing and new conditions), requirements for environmental adjustments, participation in work, education, and community activities, psychological well-being, and cognitive capabilities (Tso et al., 2021). Another example is the Danish National Patient Registry (Schmidt et al., 2015) which longitudinally collects administrative and clinical data at the national level. These types of registries contribute to the understanding of the clinical course, development, risk factors and long-term results, but also facilitate the study of how an ABI influences occupational engagement and its economic ramifications (Stromberg et al., 2019).

Is a broader definition needed for research studies into employment?

The insights offered by this study prompt us to reflect on the operational definition used in characterising employment status or return into the workforce among individuals who have experienced an ABI. This arises mainly from two aspects. Firstly, our research has unveiled a subset of individuals within working age who are excluded from the labour force due to their health circumstances. While they formally satisfy the conditions for being categorised as not active, it is not possible to assume that they are people who are not interested in returning to work. As previously emphasised, the lack of vocational rehabilitation benefits, prevailing employer biases towards individuals with ABI, and an absence of inclusive labour policies all contribute to a decreased labour participation (Karcz et al., 2022). Research findings have indicated that return into the workforce after an ABI is an extensive and challenging process, in which both personal factors and external obstacles impede access to employment (Graff et al., 2021). Consequently, when examining the job status of individuals impacted by an illness, a comprehensive approach is necessary, extending beyond merely contrasting those who have successfully re-entered employment with those who remain unemployed but actively seeking jobs. The complexity lies in considering what it means to be engaged in work activity, as well as what reasons associated with the disease hinder an individual's capacity to fulfil this role. Not taking this last point into account may contribute to underestimating or overestimating labour force participation and unemployment figures.

Furthermore, as we worked with data that had already been collected, the variables had to be treated dichotomously (participates/does not participate at work). While this approach is prevalent in work and ABI research, it does come with certain constraints (Aliaga et al., 2023). For example, it omits specific subsets of individuals who don't conform to the formal parameters of "productive work," such as women who manage households, attend to childcare, and combine domestic responsibilities with sporadic or informal work. Nationally, statistics show that women bear around 67% of this workload (INE, 2015). The literature has shown that tasks of this nature are inherently intricate, ongoing, taxing, and entail a substantial mental burden, accompanied by considerable responsibility. Consequently, there exists a strong likelihood that these responsibilities could be disrupted by the physical, cognitive, and behavioural repercussions of an ABI.

However, household tasks are usually undervalued, or not considered as part of the productive force (Barriga et al., 2020). Also, there are individuals who, owing to the complexities of their post-illness recovery process, work part-time or need technical assistance as part of the process of reintegrating into the workforce. However, these people appear as not interested in trying to enter the work market. Finally, age limits for employment have been expanded, as highlighted by Madero et al. (2020), despite the presence of established criteria and recommendations regulating what constitutes the working age. In this sense, finding people over 65 who continue to work beyond retirement age is quite common (Scheil-Adlung, 2013). Similarly, it is possible that young people under the age of 18 might also be active in the labour market (ILO, 2010).

The outcomes of our study can provide valuable insights into the experiences of individuals with ABI and their participation in the workforce. Chile has *Law No. 21,015* on the inclusion of people with disabilities into the labour market (Ministerio de Desarrollo Social, 2017). Nevertheless, there remains a gap in understanding the effects of such public policies on employment rates, unemployment, and labour force participation. Using causal inference methodologies could offer valuable insights, facilitating the assessment of policy effects on one population group compared to another over time (Abadie, 2005). The data from our study also allow us to understand distinctions between individuals with ABI and other disability groups. Notably, individuals with ABI have specific requirements concerning return into the labour market (Shama, 2022). Consequently, new lines of work should be oriented towards the development of initiatives that foster labour inclusion and return into the workforce for this demographic, as has occurred in Spain (FEDACE, 2020), the United Kingdom, and the USA (Tyerman & Tiersen, 2019).

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Table 1. Descriptive data of the sample of working age

	Total (n = 9,835)
	f (%) / *M*(*SD*)
Sex (female)	5,472 (55.6%)
Age (years)	*M* 41.73 (*SD* 13.618)
Education Level (years)	*M* 11.49 (*SD* 3.977)
Area (urban)	8.327 (84.7%)
Work	
Employed	6,628 (67.4%)
Unemployed	472 (4.8%)
Not active	2,730 (27.8%)
Income as freelance (CLP)	*M* $ 334,049.34 (SD $ 590,461.249)
Family Income (CLP)	*M* $ 758,461.95 (SD $ 910,259.295)
Disability (presents)	1.586 (16.1%)
Degree of disability	
Mild/Moderate	1.083 (11%)
Severe	503 (5.1%)
Functional dependency	
Mild	152 (1.5%)
Moderate/Severe	355 (3.6%)

CLP: Chilean Pesos; M: absolute mean; SD: standard deviation of the mean

Table 2. Balance between covariates before and after matching between people with and without acquired brain injury

	Mean			Standardised mean difference[a]	
	ABI	NABI	CG (NABI post matching)	Pre-matching	Post-matching
Distance	0.03	0.01	0.03	0.58	0.00
Sex	1.59	1.53	1.58	0.13	0.02
Age	3.67	2.92	3.71	0.62	-0.03
Education level	1.67	2.16	1.7	-0.56	-0.03
Area of residence	1.15	1.15	1.15	0.01	0.03
Income quintile	2.66	3.01	2.64	-0.25	0.02
Mean difference from the standardised mean[b]	-	-	-	0.09	0.00

ABI: people who have suffered an acquired brain injury (*n* = 110); NABI: people who do not have a brain injury (n = 9,722); CG: Control group of matched people without ABI (*n* = 110);

[a] Each standardised mean difference is obtained by subtracting the ABI group mean from the CG mean, divided by the ABI standard deviation.

[b] The average of the standardised mean difference is the average of the absolute values of the means for all covariates.

Table 3. Descriptive data of the sample with brain injury and the general population actively employed

	ABI (*n* = 110)	N ABI (*n* = 9.722)	Total (*n* = 9.832)	*p value*
	f (%) / *M*(*SD*)	*f* (%) / *M*(*SD*)	*f* (%) / *M*(*SD*)	
Sex (female)	65 (59.1%)	5,404 (55.6%)	5,469 (55.6%)	n.s
Age	*M* 47.75 (*SD* 12.56)	*M* 41.65 (*SD* 13.62)	*M* 41.73 (*SD* 13.62)	< .0001
Education level	*M* 9.25 (*SD* 4.54)	*M* 11.52 (*SD* 3.96)	*M* 11.49 (*SD* 3.98)	< .0001
Area (urban)	93 (84.5%)	8,231 (84.7%)	8,324 (84.7%)	n.s.
Work				.025
Employed	61 (55.5%)	6,565 (67.5%)	6,626 (67.4%)	
Unemployed	8 (7.3%)	464 (4.8%)	472 (4.8%)	
Not active	41 (37.3%)	2,688 (27.6%)	2,729 (27.8%)	
Income as freelance (CLP)	*M* $ 238,199.3 (*SD* $ 369,085)	*M* $ 335,182.43 (*SD* $592,502.41)	*M* $ 334,049.34 (*SD* $ 590,461.25)	n.s
Family Income	*M* $ 545,581.7 (*SD* $465,094.83)	*M* $ 760,852.31 (*SD* $913,908.82)	*M* $ 758,461.95 (*SD* $910,259.295)	< .0001
Household income quintile				n.s
I	32 (29.1%)	1,997 (20.5%)	2,029 (20.6%)	
II	22 (20%)	1,982 (20.4%)	2,004 (20.4%)	
III	22 (20%)	1,943 (20%)	1,965 (20%)	
IV	19 (17.3%)	1,977 (20.3%)	1,996 (20.3%)	
V	15 (13.6%)	1,823 (18.3%)	1,838 (18.7%)	
Disability	55 (50%)	1,529 (15.7%)	1,584 (16.1%)	< .0001
Grade				< .0001
Mild/Moderate	25 (22.7%)	1,056 (10.9%)	1,081 (11%)	
Severe	30 (27.3%)	473 (4.9%)	503 (5.1%)	
Functional dependency				< .0001
Mild	5 (4.5%)	147 (1.5%)	152 (1.5%)	
Moderate/Severe	19 (17.27%)	336 (3.5%)	355 (3.6%)	

ABI: people who have suffered an acquired brain injury; NABI: people who do not have a brain injury; CLP: Chilean Pesos; M: absolute mean; SD: standard deviation of the mean

p value: Chi-square or Student's t-test/Mann-Whitney U test $P < .05$; n.s.: not significant

Table 4. Percentage of labour participation between people with and without ABI

	ABI		NABI		Total		*p value*
	Participate (n = 69)	*Not active (n = 41)*	*Participate (n = 7.029)*	*Not active (n = 2.688)*	*Participate (n = 7.100)*	*Not active (n = 2.730)*	
	f (%)	*f* (%)	*f* (%)	*f* (%)	*f* (%)	*f* (%)	
Female	38 (58.5)	27 (41.5)	3,308 (92.8)	2,094 (38.8)	3,346 (61.2)	2,121 (38.8)	n.s.
Male	31 (68.9)	14 (31.1)	3,721 (86.2)	594 (13.8)	3,752 (86.1)	608 (13.9)	< .0001
Age	47.09 ± 10.81	48.85 ± 15.13	41.84 ± 12.5	41.16 ± 16.16	41.90 ± 12.50	41.28 ± 16.16	< .001
Education level	10.14 ± 4.07	7.73 ± 4.93	11.92 ± 3.79	10.47 ± 4.2	11.90 ± 3.80	10.43 ± 4.23	< .0001
Area (urban)	60 (64.5)	33 (35.5)	6,041(73.4)	2,187 (26.6)	6,101 (73.3)	2,220 (26.7)	.054
Disability	32 (58.2)	23 (41.8)	933 (61.1)	595 (38.9)	965 (61)	618 (39)	n.s.
Mild/Moderate	19 (76)	6 (24)	715 (67.7)	341 (32.3)	743 (67.9)	347 (32.1)	
Severe	13 (43.3)	17 (56.7)	218 (46.2)	254 (53.8)	231 (46)	271 (54)	
Indep. Functional	59 (68.6)	27 (31.4)	6,829(73.9)	2,406 (26.1)	6,888 (73.9)	2,433 (26.1)	n.s
Income Quintile							n.s
I	15 (46.9)	17 (53.1)	1,094 (54.8)	902 (45.2)	1,109 (54.7)	919 (45.3)	
II	11 (50)	11 (50)	1.319 (66.6)	661 (33.4)	1,330 (66.4)	672 (33.6)	
III	18 (81.8)	4 (18.2)	1,447 (74.5)	496 (25.5)	1,465 (74.6)	500 (25.4)	
IV	14 (73.7)	5 (26.3)	1,595 (80.7)	381 (19.3)	1,609 (80.7)	386 (19.3)	
V	11 (73.3)	4 (26.7)	1,574 (86.4)	248 (13.6)	1,585 (86.3)	252 (13.7)	

ABI: people who have suffered an acquired brain injury; NABI: people who do not have a brain injury; CLP: Chilean Pesos; M: absolute mean; SD: standard deviation of the mean
p value: Chi-square or Student's t-test/Mann-Whitney U test $P < .05$; n.s.: not significant

Table 5. Percentage of unemployment between people with and without ABI

	ABI		NABI		Total		Sig
	Employed *(n = 61)*	*Unemployed* *(n = 8)*	*Employed* *(n = 6.565)*	*Unemployed* *(n = 464)*	*Employed* *(n = 6.626)*	*Unemployed* *(n = 472)*	
	f (%)	*f* (%)	*f* (%)	*f* (%)	*f* (%)	*f* (%)	
Female	35 (92.1)	3 (7.9)	3,070 (92.8)	238 (7.2)	3,105 (92.8)	241 (7.2)	n.s.
Male	26 (83.9)	5 (16.1)	3,595 (93.9)	226 (6.1)	3,521 (93.8)	231 (6.2)	< .05
Age	48.20 ± 9.93	38.63 ± 14.04	42.24 ± 12.36	36.19 ± 13.09	42.30 ± 12.35	36.23 ± 13.10	n.s.
Education level	9.87 ± 4.07	12.25 ± 3.65	11.91 ± 3.82	12.04 ± 3.35	11.89 ± 3.83	12.04 ± 3.35	n.s.
Area (urban)	53 (88.3)	7 (11.7)	6.543 (93.4)	398 (6.6)	5,696 (93.4)	405 (6.6)	n.s.
Disability	28 (87.5)	4 (12.5)	862 (92.4)	71 (7.6)	890 (92.2)	75 (7.8)	n.s.
Mild/Moderate	18 (94.7)	1 (5.3)	661 (92.4)	54 (7.6)	679 (92.5)	55 (7.5)	
Severe	10 (76.9)	3 (23.1)	201 (92.2)	17 (7.8)	211 (91.3)	20 (8.7)	
Indep. Functional	52 (88.1)	7 (11.9)	6,383 (93.5)	446 (6.5)	6,435 (93.4)	453 (6.6)	n.s.
Income Quintile							
I	12 (80)	3 (20)	890 (81.4)	204 (18.6)	902 (81.3)	207 (18.7)	
II	10 (90.9)	1 (9.1)	1,227 (93)	92 (7.0)	1237 (93)	93 (7.0)	
III	14 (77.8)	4 (22.2)	1,368 (94.5)	79 (5.5)	1,382 (94.3)	83 (5.7)	< .01
IV	14 (100)	0 (0)	1,533 (96.1)	62 (3.9)	1,547 (96.1)	63 (3.9)	
V	11 (100)	0 (0)	1.547 (98.3)	27 (1.7)	1,558 (98.3)	27 (1.7)	

ABI: people who have suffered an acquired brain injury; NABI: people who do not have a brain injury; CLP: Chilean Pesos; M: absolute mean; SD: standard deviation of the mean
p value: Chi-square or Student's t-test/Mann-Whitney U test $P < .05$; n.s.: not significant

Table 6 Binary logistic regression model for employment status

Predictors	B	W	Sig	OR	95% CI	
ABI	1.060	6.195	.013*	2.888	1.253	6.655
Disability	0.786	11.103	.001*	2.195	1.382	3.486
Constant	-2.317	42.668	.00	0.099		

B: regression coefficient; W: Wald statistic; sig: level of statistical significance; OR: odd ratio; CI: confidence interval of the OR with a confidence level of 95%
* indicates statistical significance (p < .005)