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Original Article

Prevalence of burnout and its association with demographic and workplace factors among health workers during the COVID-19 pandemic in Osorno Province, Southern Chile

Prevalencia de burnout y su asociación con factores demográficos y laborales entre trabajadores de la salud durante la pandemia de COVID 19 en la Provincia de Osorno, Sur de Chile

Prevalência de Burnout e sua associação com fatores demográficos e do local de trabalho entre profissionais de saúde durante a pandemia de COVID-19 na província de Osorno, no sul do Chile

María Paz Contreras[a], Antonio Vargas[b], Jovan Kuzmicic[a,c]

[a]Departamento de Salud, Universidad de Los Lagos, Osorno, Chile.
[b]Departamento de Ciencias Sociales, Universidad de Los Lagos, Osorno, Chile.
[c]Programa de Investigación en Biomedicina y Biotecnología en Salud, Departamento de Salud, Universidad de Los Lagos, Osorno, Chile.

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Abstract

Introduction: Chronic work stress, such as during COVID-19 pandemic, can lead to Burnout Syndrome, a depressive psychological disorder characterized by mental and physical exhaustion, affecting 11.2% of nurses worldwide. However, evidence is scarce and controversial in Chile. **Objective:** To study the prevalence of burnout and its relationship with demographic and occupational profile in healthcare workers during the COVID-19 pandemic in Osorno Province, Southern Chile. **Methods:** Quantitative study through a non-experimental cross-sectional correlational design based on a socio-demographic survey associated with the Maslach Inventory (adapted to Spanish) to measure burnout. Healthcare personnel treating COVID-19 patients in primary and secondary healthcare centers in the Osorno Province were considered. **Results:** A total of 275 workers were included (41 nurses, 234 other clinical staff), with the majority being women (73%) and young (<39 years, 65.5%). Low levels of burnout (8.4%) were observed with high Emotional Exhaustion (45.1%) negatively

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associated with the presence of the partner/spouse ($p<0.05$), daytime shifts ($p<0.05$), Leadership Support Perception ($p<0.01$), and Work Environment Relationships ($p<0.01$), and positively associated with Work Difficulty Perception ($p<0.01$). **Conclusion:** Burnout levels reported herein (8.4%) are consistent with pre-pandemic burnout and differ from what was reported during the early response to COVID-19. Local and cultural factors, as well as the availability of vaccines and effective treatment alternatives at the time of this measurement, may explain the discrepancy and improve understanding of this work-related phenomenon.

Keywords: Burnout, Professional; COVID-19, Occupational Stress, Health Personnel, Chile.

Resumen

Introducción: El estrés laboral crónico, como el producido durante la pandemia por COVID-19, puede producir Síndrome de Burnout, un trastorno sicológico depresivo con agotamiento mental y físico, afectando a un 11,2% de enfermeras/os mundialmente. Sin embargo, la evidencia es controversial y escasa en Chile. **Objetivo:** Estudiar la prevalencia de burnout y su relación con características demográficas y laborales en funcionarios de salud durante la pandemia por COVID-19 en la Provincia de Osorno, en el Sur de Chile. **Métodos:** Paradigma cuantitativo mediante diseño no experimental correlacional de corte transversal basado en una encuesta socio-demográfica asociada al inventario de Maslach adaptado al español para la medición de burnout. Se incluyó personal de salud en centros asistenciales de mediana y alta complejidad de la Provincia de Osorno que atendieron usuarios con COVID-19. **Resultados:** Se incluyó un total de 275 trabajadores (41 enfermeros/as, 234 otro personal clínico), siendo la mayoría mujeres (73%) jóvenes (<39 años, 65,5%). Se observó bajo porcentaje de burnout (8,4%) con elevado Agotamiento Emocional (45,1%), asociado negativamente a la presencia de pareja afectiva ($p<0,05$), turnos diurnos ($p<0,05$), Percepción de Apoyo de la Jefatura ($p<0,01$) y Relación con el Entorno Laboral ($p<0,01$), y positivamente con la Percepción de la Dificultad Laboral ($p<0,01$). **Conclusión:** La prevalencia de burnout aquí reportada (8,4%) es consistente con el burnout pre-pandemia y difiere de lo reportado durante la respuesta temprana al COVID-19. Factores locales, culturales, así como la disponibilidad de vacunas y mejores alternativas de tratamiento al momento de esta medición pueden explicar la discrepancia y mejorar la comprensión del fenómeno.

Palabras clave: Agotamiento Profesional, COVID-19, Estrés Laboral, Personal de Salud, Chile.

Resumo

Introdução: O estresse crônico no trabalho, como vivenciado durante a pandemia de COVID-19, pode levar à Síndrome de Burnout, um distúrbio psicológico depressivo caracterizado por exaustão mental e física, afetando 11,2% dos enfermeiros em todo o mundo. No entanto, as evidências são controversas e escassas no Chile. **Objetivo:** Estudar a prevalência do burnout e sua relação com características demográficas e ocupacionais em funcionários da saúde durante a pandemia de COVID-19 na província de Osorno, no Sul do Chile. **Métodos**: Paradigma quantitativo por meio de um desenho não experimental correlacional de corte transversal baseado em uma pesquisa sociodemográfica associada ao

inventário de Maslach adaptado para o espanhol para a medição do burnout. Foram incluídos pessoal de saúde em centros assistenciais de média e alta complexidade da Província de Osorno que atenderam usuários com COVID-19. **Resultados:** Um total de 275 trabalhadores foi incluído (41 enfermeiros, 234 outros profissionais clínicos), sendo a maioria mulheres (73%) e jovens (<39 anos, 65,5%). Foram observados baixos níveis de burnout (8,4%) com alto esgotamento emocional (45,1%), associado negativamente à presença de parceiro afetivo (p<0,05), turnos diurnos (p<0,05), Percepção de Apoio da Chefia (p<0,01) e Relação com o Ambiente de Trabalho (p<0,01), e positivamente com a Percepção da Dificuldade do Trabalho (p<0,01). **Conclusão:** Os níveis de burnout relatados aqui (8,4%) são consistentes com o burnout pré-pandemia e diferem do relatado durante a resposta inicial à COVID-19. Fatores locais, culturais, a disponibilidade de vacinas e melhores alternativas de tratamento no momento desta medição podem explicar a discrepância e melhorar a compreensão do fenômeno.

Palavras-chave: Esgotamento Profissional, COVID-19, Estresse Ocupacional, Pessoal de Saúde, Chile.

Introduction

COVID-19 is a highly contagious infectious respiratory disease caused by the SARS-CoV-2 virus, first reported in late 2019. While this pathology significantly affects general population, the literature suggests that healthcare workers are particularly vulnerable to the virus and the psychological consequences of this infection (Rodríguez & Sánchez, 2020). COVID-19 impact on mental health of healthcare professionals is significant and associated with difficulties in job performance, jeopardizing patient care and decision-making tasks (Serrano-Ripoll et al., 2020). Therefore, studying mental health on clinical staff exposed to COVID-19 is crucial for developing the necessary professional and health competencies to protect these workers in order to better prepare them to respond to future pandemics or other situations with similar workloads.

Severe or chronic stress can lead to Burnout Syndrome (or burnout), a psychological disorder characterized by depression, preceded by mental and physical exhaustion caused by overwhelming work conditions (Oliveira et al., 2023). Previous evidence associates the response to epidemics and health emergencies with burnout among healthcare workers, hindering their ability to respond to the situation correctly (Woo et al., 2020). Interestingly, nursing staff seems to be particularly sensitive to this, and worldwide reports show a burnout prevalence of 11.2% in nurses (Woo et al., 2020).

During the COVID-19 pandemic working conditions for healthcare professionals involved unprecedented levels of stress; thus, a deterioration in their mental health was expected. Consequently, several reports show higher burnout incidence among these professionals worldwide, especially when analyzing nursing staff, frontline workers, and women (Danet, 2021; Laris et al., 2022). Additionally, research conducted in Australia (Dixon et al., 2022), Cyprus (Fteropoulli et al., 2021), Turkey (Önen Sertöz et al., 2021), and Taiwan (Sung et al., 2021) concluded that the most significant risk factors for burnout included being female, being nurse or doctor, and working in frontline units with hospitalized or intensive care patients. On the other hand, in Serbia (Jakovljevic et al., 2021),

pharmaceutical personnel were mostly affected, while in Spain (Ruiz-Fernández et al., 2020) and another study in Turkey (Yılmaz et al., 2021) showed higher burnout in clinicians. In contrast, no significant differences were found in any healthcare group in Singapore (Tan et al., 2020). Locally, the Latin American scenario is in agreement with worldwide trends by reporting higher burnout among nurses in Brazil (Moreira & Lucca, 2020; Oliveira et al., 2023) and Colombia (Hernández et al., 2024). Taken together, this evidence shows a strong association between COVID-19 and burnout among healthcare workers, but with controversial results when studying specific populations. Given the complexity of the phenomenon, along with the differences in idiosyncrasies and working conditions, it is reasonable to assume a strong influence of local factors in the development of burnout, making general conclusions difficult to obtain from these reports.

In Chile, significant changes to the healthcare structure were introduced in response to the COVID-19 pandemic. These included the integration of public and private systems, the increase in critical care units, the incorporation of new equipment for assisted ventilation, changes in hospital structure—allocating large sectors COVID-19 patient care—and role reassignment for professional staff and hospital support teams, among others (Ministerio Salud de Chile, 2020). Currently, there are few studies accounting for burnout levels among Chilean health professionals (Macaya & Aranda, 2020). However, the available information shows that 64.1% of female nurses showed burnout (Aguayo-Verdugo et al., 2023). Additionally, a study published by the Confederation of Democratic University Health Professionals (CONFEDEPRUS from the Spanish *Confederación Democrática de Profesionales Universitarios de Salud*) on burnout and associated psychosocial occupational risks in the early stages of the pandemic (2020), reported severe burnout symptoms in all health professionals, with women being one of the risk groups (Matamala Pizarro & Barrera, 2020). Another study that evaluated burnout in healthcare workers, including doctors, nurses, nursing technicians, kinesiologists, and support staff, from the private healthcare sector showed a high incidence of burnout (75.6%) without gender difference (Cabezón et al., 2021). These studies partially represent the working environment of Chilean healthcare personnel during the COVID-19 pandemic. However, these results are highly biased towards the Metropolitan Region, without coverage of the public healthcare network nor the southern part of the country. Therefore, this study seeks to address this knowledge gap.

Currently, the evolution of the nursing profession is one of the most debated topics. The roles and environment of nursing have changed significantly over time, facing many challenges that go beyond direct patient care, including dealing with staff shortages, working overload and poor working conditions, low wages, scarcity of resources and materials, among others (Andrade-Pizarro et al., 2023). Taken together, this directly affects the professional ability to provide adequate care. In turn, this leaves the professionals at great risk of developing mental health problems that will ultimately lead to burnout syndrome (Alves de Lima & Cezar Mendes, 2022).

This study describes findings on the incidence of burnout among healthcare and nursing personnel in the public health network of the Osorno Health Service, which includes all hospitals and non-hospital care units in Osorno province in Los Lagos Region. The objective was to evaluate the presence of Burnout Syndrome in health workers in Osorno Province during the pandemic. Additionally, the relationship of demographic and working environment characteristics as determinants of burnout or its early markers was analyzed.

Methodology

Experimental design and sample size

This study followed a non-experimental correlational cross-sectional design based on a quantitave approach. The target population was a universe of 2036 employees of the Osorno Province Health Service, Chile. Participants were selected through non-probabilistic purposive sampling. Inclusion criteria considered subjects with a professional degree enrolled in health institutions of the Osorno Province. Exclusion criteria considered administrative personnel or health personnel who did not provide patient care.

Burnout measurement

Burnout was measured using the healthcare or service professional version of the Maslach Burnout Inventory (MBI-HSS) (Maslach & Jackson 1986) adapted to Spanish (Peiró Silla & Gil Monte, 1999). The MBI-HSS consists of 22 Likert-type response items with 7 options between 0 and 6, ranging from *never* to *every day*. The MBI-HSS allows identifying three specific manifestations of the burnout syndrome such as Depersonalization (5 items; m= 6.04 α=.79), Emotional Exhaustion (9 items; m= 20.34 α=.90) and Personal Accomplishment (8 items; m= 36.39 α=.71). Each subscale is divided into 3 levels (low, moderate, and high), according to previously validated data in the Chilean population. The values considered for each of the subscales are as follows: EE (low ≤ 18, moderate 19-26, high ≥ 27), D (low ≤ 5, moderate 6-9, high ≥ 10) and PA (low ≥ 34, moderate 29-33, high ≤ 28).

Data collection

A socio-demographic record was created to collect demographic and occupational data, including age, gender, living with a romantic partner, caring for people within risks groups (including children under two years old, elderly people, and/or people with disabilities), and profession. Additionally, occupational variables were also collected, such as clinical service of employment, years of experience, daily working hours, shift type, perceived task difficulty (in terms of very low, low, normal, high, and very high), perceived support from their supervisor (very low, low, normal, high, and very high) and relationships with the work team (excellent, good, regular, bad, very bad). The application of the questionnaire and informed consent was carried out online, via email sent to the entire target population between June and August 2022.

Ethics and consent

Both the intervention questionnaire and the informed consent form were approved by the Ethics Committee of the Valdivia Health Service (Ord.: N°416, 28th of October, 2021). Additionally, participants could contact the research team at any time to address any doubts related to their participation in the study.

Data analysis

Data collected was analyzed using the SPSS statistical software (version 23). Firstly, a descriptive statistical analysis was carried out where frequency tables were created according to each study variable. Secondly, hypothesis tests of the relationships between demographic and occupational variables and the dimensions of Burnout Syndrome were carried out using the *chi*-square statistic, considering a significance level of less than 0.05.

Results

This study represents the first psychological well-being measurement of the healthcare workers in the Osorno Province Health Service–part of the public healthcare network of the Los Lagos Region in southern Chile–within the context of the COVID-19 pandemic. All the 7 main hospitals in the area and one primary care center were included, and considered only personnel in direct contact to patients. As shown in **Table 1**, the surveyed population included a total of 275 healthcare workers, divided into 41 nurses and 234 other professionals. Of the total participants, the majority were women (73%), with a greater female bias in the nurse subgroup (82%). Regarding age distribution, a higher proportion of young professionals (<39 years old) was observed in the nurse group, although in both subsamples the group with the highest representation corresponds to professionals between 30-39 years old. Regarding family configuration, both groups showed similar distributions in terms of living with romantic partners; however, the nurse subsample showed a lower proportion of children and/or people at risk under their care, consistent with their age distribution. Given the geographical characteristics and the distribution of healthcare centers in the Osorno Province, the place of residence of the surveyed population was evaluated. Over 85% of the total sample, and more than 92% of nurses, resided within the urban radius around the healthcare centers where they worked.

Table 1. Demographic characteristics of the sample group.

	Nurse		Other clinical personnel†		Total	
	n	%	n	%	n	%
Gender						
Female	34	82.9%	167	71.4%	201	73.1%
Male	7	17.1%	67	28.6%	74	26.9%
Age						
20 to 29 years old	8	19.5%	37	15.8%	45	16.4%
30 to 39 years old	28	68.3%	107	45.7%	135	49.1%
40 to 49 years old	4	9.8%	54	23.1%	58	21.1%
50 to 64 years old	1	2.4%	34	14.5%	35	12.7%
More than 65 years old	0	0.0%	2	0.9%	2	0.7%
Lives with a romantic partner						
Yes	21	51.2%	116	49.6%	137	49.8%
No	20	48.8%	118	50.4%	138	50.2%
Has children under care						
Yes	22	53.7%	160	68.4%	182	66.2%
No	19	46.3%	74	31.6%	93	33.8%
Has people of risk groups under care ‡						
Yes	7	17.1%	53	22.6%	60	21.8%
No	34	82.9%	181	77.4%	215	78.2%
Area of residence						
Urban	38	92.7%	196	83.8%	234	85.1%
Rural	3	7.3%	38	16.2%	41	14.9%

†Including all health personnel distinct from nurses that are directly involved in patient care. Excluding administrative staff. ‡Considers children under 2 years old, elderly people and/or people with disabilities.

Next, **Table 2** shows the results related to the presence of Burnout Syndrome measured through the Maslach Scale adapted to Spanish (Peiró Silla & Gil Monte, 1999). Interestingly, the surveyed population showed a low burnout incidence (8.4%), being

slightly lower in the nurse subgroup (7.3%). When individually analyzing the three dimensions of the burnout scale, it was observed that Depersonalization and Personal Accomplishment levels were within ranges consistent with the measured amount of burnout. However, the general population presented symptoms of high Emotional Exhaustion (45.1%), being slightly higher in the nurse subgroup (51.2%). Although these findings were not statistically significant, they correspond to an early indicator of the presence of burnout, so their relationship with the other variables included in the study was analyzed in more depth in the tables presented below.

Table 2. Burnout syndrome incidence and presence of early burnout symptoms in the sample group.

	Nurse		Other clinical personnel		Total	
	n	%	n	%	n	%
Burnout presence						
Yes	3	7.3%	20	8.5%	23	8.4%
No	38	92.7%	214	91.5%	252	91.6%
Emotional Exhaustion Level						
High	21	51.2%	103	44.0%	124	45.1%
Intermediate	8	19.5%	59	25.2%	67	24.4%
Low	12	29.3%	72	30.8%	84	30.5%
Depersonalization Level						
High	7	17.1%	53	22.6%	60	21.8%
Intermediate	8	19.5%	46	19.7%	54	19.6%
Low	26	63.4%	135	57.7%	161	58.5%
Personal Realization Level						
High	16	39.0%	92	39.3%	108	39.3%
Intermediate	15	36.6%	82	35.0%	97	35.3%
Low	10	24.4%	60	25.6%	70	25.5%

Tables 3-5 show the individual analysis for each dimension of the Maslach Scale in comparison to the most relevant sociodemographic variables and some aggregated criteria representing the work environment, for both subsamples (Nurses and Other Clinical Personnel) and the Total Population. As shown in **Table 3**, a higher level of Emotional Exhaustion was negatively associated with the presence of a romantic partner ($p<0.05$) and with daytime shifts ($p<0.05$) in both subgroups and the total population. Additionally, a high Perception of Difficulty at Work was associated with higher levels of Emotional Exhaustion in both the Other Clinical Personnel subpopulation ($p<0.01$) and the Total Population ($p<0.01$), while the Perception of Support from the Supervisor was inversely associated with Emotional Exhaustion in the same groups (Other Clinical Personnel, $p<0.01$; Total Population, $p<0.001$). Additionally, the Relationship with the Work Environment negatively affected Emotional Exhaustion in the entire population ($p<0.01$) and Other Clinical Personnel ($p<0.01$).

Similarly, **Table 4** shows the result of the analysis for the presence of Depersonalization in healthcare personnel. A positive association was observed with the Perception of Support from the Supervisor in the Other Clinical Personnel subpopulation ($p<0.05$) and inverse with the Perception of Support from the Supervisor in the Total Population ($p<0.05$).

Table 3. Comparison of Emotional Exhaustion level with socio-demographic and working environment characteristics.

	Emotional Exhaustion Level								
	Nurse			Other clinical personnel			Total		
	Low n (%)	Intermediate n (%)	High n (%)	Low n (%)	Intermediate n (%)	High n (%)	Low n (%)	Intermediate n (%)	High n (%)
Gender									
Female	10 (29.4%)	7 (20.5%)	17 (50%)	47 (28.1%)	42 (25.1%)	78 (46.7%)	57 (28.3%)	49 (24.3%)	95 (47.2%)
Male	2 (28.5%)	1 (14.2%)	4 (57.1%)	25 (37.3%)	17 (25.3%)	25 (37.3%)	27 (36.4%)	18 (24.3%)	29 (39.1%)
Lives with a romantic partner									
Yes	2 (9.5%)	5 (23.8%)	14 (66.6%)	31 (26.7%)	35 (30.1%)	50 (43.1%)	33 (24%)*	40 (29.1%)*	64 (46.7%)*
No	10 (50%)	3 (15%)	7 (35%)	41 (34.7%)	24 (20.3%)	53 (44.9%)	51 (36.9%)*	27 (19.5%)*	60 (43.4%)*
Has children under care									
Yes	7 (36.8%)	2 (10.5%)	10 (52.6%)	20 (27%)	14 (18.9%)	40 (54%)	27 (29%)	16 (17.2%)	50 (53.7%)
No	5 (22.7%)	6 (27.2%)	11 (50%)	52 (32.5%)	45 (28.1%)	63 (39.3%)	57 (31.3%)	51 (28%)	74 (40.6%)
Shift type									
Daytime	4 (16.6%)*	4 (16.6%)*	16 (66.6%)*	35 (25.1%)*	42 (30.2%)*	62 (44.6%)*	39 (23.9%)*	46 (28.2%)*	78 (47.8%)*
Other	8 (47%)*	4 (23.5%)*	5 (29.4%)*	37 (38.9%)*	17 (17.8%)*	41 (43.1%)*	45 (40.1%)*	21 (18.7%)*	46 (41%)*
Perception of Difficulty at Work									
Very low/Low	0 (0.0%)	1 (50.0%)	1 (50.0%)	0 (0%)	0 (0%)	0 (%)	0 (0.0%)**	1 (50.0%)**	1 (50.0%)**
Normal	7 (53.8%)	1 (7.7%)	5 (38.5%)	31 (47.0%)**	16 (24.2%)**	19 (28.8%)**	38 (48.1%)**	17 (21.5%)**	24 (30.4%)**
High/Very high	5 (19.2%)	6 (23.1%)	15 (57.7%)	41 (24.4%)**	43 (25.6%)**	84 (50.0%)**	46 (23.7%)**	49 (25.3%)**	99 (51.0%)**
Perception of Support from Supervisor									
Low/Normal	5 (19.2%)	4 (15.4%)	17 (65.4%)	37 (24.8%)**	33 (22.1%)	79 (53.0%)**	42 (24.0%)***	37 (21.1%)	96 (54.9%)***
Good/Very good	7 (46.7%)	4 (26.7%)	4 (26.7%)	35 (41.2%)**	26 (30.6%)	24 (28.2%)**	42 (42.0%)***	30 (30.0%)	28 (28.0%)***
Relationship with Work Environment									
Bad/Regular	2 (20.0%)	1 (10.0%)	7 (70.0%)	7 (14.3%)**	12 (24.5%)**	30 (63.6%)**	9 (15.3%)**	13 (22.0%)**	37 (62.7%)**
Good/Excellent	10 (32.3%)	7 (22.6%)	14 (45.2%)	65 (35.1%)**	47 (25.4%)**	73 (39.5%)**	75 (34.7%)**	54 (25.0%)**	87 (40.3%)**

Between-group comparisons were analyzed using chi-square test. *, p<0.05; **, p<0.01; ***, p<0.001.

Table 4. Comparison of Depersonalization level with socio-demographic and working environment characteristics.

	Depersonalization Level								
	Nurse			Other clinical personnel			Total		
	Intermediate n (%)	High n (%)	Low n (%)	Intermediate n (%)	High n (%)	Low n (%)	Intermediate n (%)	High n (%)	Low n (%)
Gender									
Female	23 (67.6%)	5 (14.7%)	6 (17.6%)	97 (58%)	33 (19.7%)	37 (22.1%)	120 (59.7%)	38 (18.9%)	43 (21.3%)
Male	3 (42.8%)	3 (42.8%)	1 (14.2%)	38 (56.7%)	13 (19.4%)	16 (23.8%)	41 (55.4%)	16 (21.6%)	17 (22.9%)
Lives with a romantic partner									
Yes	13 (61.9%)	4 (19%)	4 (19%)	62 (53.4%)	26 (22.4%)	28 (24.1%)	75 (54.7%)	30 (21.8%)	32 (23.3%)
No	13 (65%)	4 (20%)	3 (15%)	73 (61.8%)	20 (16.9%)	25 (21.1%)	86 (62.3%)	24 (17.3%)	28 (20.2%)
Has children under care									
Yes	12 (63.1%)	3 (15.7%)	4 (21%)	46 (62.1%)	9 (12.1%)	19 (25.6%)	58 (62.3%)	12 (12.9%)	23 (24.7%)
No	14 (63.6%)	5 (22.7%)	3 (13.6%)	89 (55.6%)	37 (23.1%)	34 (21.2%)	103 (56.5%)	42 (23%)	37 (20.3%)
Shift type									
Daytime	14 (58.3%)	6 (25%)	4 (16.6%)	81 (58.2%)	26 (18.7%)	32 (23%)	95 (58.2%)	32 (19.6%)	36 (22%)
Other	12 (70.5%)	2 (11.7%)	3 (17.6%)	54 (56.8%)	20 (21%)	21 (22.1%)	66 (58.9%)	22 (19.6%)	24 (21.4%)
Perception of Difficulty at Work									
Very low/Low	1 (50.0%)	1 (50.0%)	0 (0.0%)	0 (0%)*	0 (0%)*	0 (0%)*	1 (50.0%)	1 (50.0%)	0 (0.0%)
Normal	7 (53.8%)	4 (30.8%)	2 (15.5%)	47 (71.2%)*	7 (10.6%)*	12 (18.1%)*	54 (68.4%)	11 (13.9%)	14 (17.7%)
High/Very high	18 (69.2%)	3 (11.5%)	5 (19.5%)	88 (52.4%)*	39 (23.2%)*	41 (24.4%)*	106 (54.6%)	42 (21.6%)	46 (23.7%)
Perception of Support from Supervisor									
Low/Normal	15 (57.7%)	6 (23.1%)	5 (19.2%)	79 (53.0%)	29 (19.5%)	41 (27.5%)	94 (53.7%)*	35 (20.1%)*	46 (26.3%)*
Good/Very good	11 (73.3%)	2 (13.3%)	2 (13.3%)	56 (65.9%)	17 (20.0%)	12 (14.1%)	67 (67.0%)*	19 (19.0%)*	14 (14.0%)*
Relationship with Work Environment									
Bad/Regular	8 (80.0%)	1 (10.0%)	1 (10.0%)	22 (44.9%)	13 (26.5%)	14 (28.6%)	30 (50.8%)	14 (23.7%)	15 (25.4%)
Good/Excellent	18 (58.1%)	7 (22.6%)	6 (19.4%)	113 (61.1%)	33 (17.8%)	39 (21.1%)	131 (60.6%)	40 (18.5%)	45 (20.8%)

Between-group comparisons were analyzed using chi-square test. *, $p<0.05$.

Table 5. Comparison of Personal Accomplishment levels with socio-demographic and working environment characteristics.

	Personal Realization Level								
	Nurse			Other clinical personnel			Total		
	Intermediate n (%)	High n (%)	Low n (%)	Intermediate n (%)	High n (%)	Low n (%)	Intermediate n (%)	High n (%)	Low n (%)
Gender									
Female	10 (29.4%)	13 (38.2%)	11 (32.3%)	47 (28.1%)	64 (38.3%)	56 (33.5%)	57 (28.3%)	77 (38.3%)	67 (33.3%)
Male	0 (0%)	2 (28.5%)	5 (71.4%)	13 (19.4%)	18 (26.8%)	36 (53.7%)	13 (17.5%)	20 (27%)	41 (55.4%)
Lives with a romantic partner									
Yes	8 (38%)	7 (33.3%)	6 (28.5%)	31 (26.7%)	36 (31%)	49 (42.2%)	39 (28.4%)	43 (31.3%)	55 (40.1%)
No	2 (10%)	8 (40%)	10 (50%)	29 (24.5%)	46 (38.9%)	43 (36.4%)	31 (22.4%)	54 (39.1%)	53 (38.4%)
Has children under care									
Yes	3 (15.7%)	7 (36.8%)	9 (47.3%)	22 (29.7%)	25 (33.7%)	27 (36.4%)	25 (26.8%)	32 (34.4%)	36 (38.7%)
No	7 (31.8%)	8 (36.3%)	7 (31.8%)	38 (23.7%)	57 (35.6%)	65 (40.6%)	45 (24.7%)	65 (35.7%)	72 (39.5%)
Shift type									
Daytime	6 (25%)	7 (29.1%)	11 (45.8%)	36 (25.8%)	49 (35.2%)	54 (38.8%)	42 (25.7%)	56 (34.3%)	65 (39.8%)
Other	4 (23.5%)	8 (47%)	5 (29.4%)	24 (25.2%)	33 (34.7%)	38 (40%)	28 (25%)	41 (36.6%)	43 (38.3%)
Perception of Difficulty at Work									
Very low/Low	0 (0.0%)	2 (100.0%)	0 (0.0%)	0 (0%)	0 (0%)	0 (0%)	0 (0.0%)	2 (100.0%)	0 (0.0%)
Normal	2 (15.4%)	5 (38.5%)	6 (46.2%)	22 (33.3%)	19 (28.7%)	25 (37.8%)	24 (30.4%)	24 (30.4%)	31 (39.2%)
High/Very high	8 (30.8%)	8 (30.8%)	10 (38.5%)	38 (22.6%)	63 (37.5%)	67 (39.9%)	46 (23.7%)	71 (36.6%)	77 (39.7%)
Perception of Support from Supervisor									
Low/Normal	7 (26.9%)	10 (38.5%)	9 (34.6%)	48 (32.2%)**	52 (34.9%)**	49 (32.9%)**	55 (31.4%)**	62 (35.4%)**	58 (33.1%)**
Good/Very good	3 (20.0%)	5 (33.3%)	7 (46.7%)	12 (14.1%)**	30 (35.3%)**	43 (50.6%)**	15 (15.0%)**	35 (35.0%)**	50 (50.0%)**
Relationship with Work Environment									
Bad/Regular	3 (30.0%)	4 (40.0%)	3 (30.0%)	23 (46.9%)***	15 (30.6%)***	11 (22.4%)***	26 (44.1%)**	19 (32.2)**	14 (23.7%)**
Good/Excellent	7 (22.6%)	11 (35.5%)	13 (41.9%)	37 (20.0%)***	67 (36.2%)***	81 (43.8%)***	44 (20.4%)**	78 (36.1%)**	94 (43.5%)**

Between-group comparisons were analyzed using *chi*-square test. **, p<0.01; ***, p<0.001.

Finally, **Table 5** shows the analysis on Personal Accomplishment. In this case, it was observed that a higher Perception of Support from the Supervisor was associated with higher levels of Personal Accomplishment for both Other Clinical Personnel ($p<0.01$) and the Total Population ($p<0.01$). Similar results were observed for the Relationship with the Work Environment in the same groups (Other Clinical Personnel, $p<0.001$; Total Population, $p<0.01$). Taken together, these results show that the work environment and the relationship with the supervisor were the most relevant elements in determining the presence of early indicators of burnout in the clinical teams of the Osorno Province Health Service.

Discussion

The Burnout Syndrome has been studied since the 1980s and is defined as a response to chronic work stress, consisting of negative attitudes and feelings towards the people one works with, and towards one's own professional role, characterized by the experience of feeling emotionally exhausted (Maslach & Jackson, 1981). It affects three dimensions, including emotional exhaustion, depersonalization, and personal accomplishment (Maslach & Jackson, 1981), as a response to chronic interpersonal stressors that develop at work. The dominant symptoms are characterized by the presence of overwhelming exhaustion, feelings of cynicism at work, and a sense of inefficiency and lack of personal fulfillment (Maslach et al., 2001).

Following the dissemination of the SARS-CoV-2 coronavirus and the declaration the COVID-19 pandemic in 2020, health services experienced an unprecedented demand due to rapid viral spread in the population. Additionally, the initial lack of knowledge about the disease and its transmission, the lack of global readiness for such an event, along with the scarcity of effective personal protection methods, configured a scenario of high psychological pressure for clinical teams, especially nurses (Lai et al., 2020; Xiang et al., 2020). Consequently, many healthcare professionals felt confused and ill prepared to treat COVID-19 patients, resulting in feelings of uncertainty and fear that negatively impacted workload management. Moreover, they had to endure isolation from family and friends in order to reduce possible infections. In fact, evidence in Chile suggests that one of the most recurrent concerns among healthcare personnel, at the beginning of the pandemic, was the fear of personal contagion (>70%) and of infecting close family or friends (>90%) (Alvarado et al., 2021). Consequently, the sum of these factors led healthcare personnel to early show adverse emotional and psychological reactions, such as anger, anxiety, insomnia, and stress (Lai et al., 2020; Xiang et al., 2020), configuring a scenario favorable for burnout development worldwide.

Considering this context, burnout development is to be expected in healthcare professionals, especially nurses, during the COVID-19 pandemic management. Although a large part of the international experience points in this direction (Danet, 2021; Dixon et al., 2022; Fteropoulli et al., 2021; Laris et al., 2022; Önen Sertöz et al., 2021; Sung et al., 2021), there are controversial results (Jakovljevic et al., 2021; Ruiz-Fernández et al., 2020; Tan et al., 2020; Yılmaz et al., 2021) regarding the presence of

burnout in these situations or the particular susceptibility of nursing teams. This discrepancy may be due to idiosyncratic differences between cultures, work environments, and healthcare system operation considered in these studies. However, it may also be highly influenced by study timing during the pandemic, and the public policies adopted by the different countries in response to this emergency. On the other hand, the burnout prevalence reported here (7.3%, see **Table 2**) is similar to global burnout levels in nurses prior to the pandemic (Woo et al., 2020). Therefore, the aforementioned local factors that affect the working conditions of healthcare teams make it difficult to generate globally valid conclusions.

In the case of Chile, initial evidence suggests the presence of burnout in healthcare personnel, both in public and private care settings (Alvarado et al., 2021; Matamala Pizarro & Barrera, 2020). Interestingly, these studies were conducted during the early stages of the pandemic and their data was collected until mid-2020. This implies that these teams were working under conditions of high uncertainty and lack of effective protection measures, such as vaccines, so the psychological burden on these workers was expected to be greater. In contrast, the results herein did not suggest the presence of burnout in a significant fraction of the surveyed population. Interestingly, data collection was carried out in significantly different periods of the pandemic. Although during mid-2022 (this study) Chile recorded a generalized increase in COVID-19 infections, with a positivity between 10-15% and comparable behavior to the second wave of infections in 2021, the impact on these contagions on the health system was considerably lower than in previous episodes (Gobierno de Chile, 2022). In fact, the use of critical care beds with COVID-19 patients reached an average of 7% (with a maximum of 9%) during the months of data collection, while during the most intense periods of the pandemic it reached an average of 56% (with a maximum of 77%) according to official figures from Chilean authorities (Gobierno de Chile, 2022). This difference can probably be explained by the implementation of effective protection measures such as vaccines. In fact, by mid-2022, the date for data collection of this study, the Pan American Health Organization reports over 17 million doses of vaccines against COVID-19 administered in Chile (Organización Panamericana de Salud, 2023), which is on the order of magnitude of the country's population (approximately 19 million). Therefore, the susceptibility to infections, the severity of infected cases, the knowledge about the disease and its transmission, along with the availability of effective protection mechanisms, possibly contributed to reduce some of the uncertainty and risks experienced by healthcare personnel at the beginning of the pandemic; thus, decreasing the incidence of burnout. Considering this, the burnout levels reported here probably respond more to the general environmental and labor conditions of healthcare personnel working with COVID-19 patients, rather than the stress associated with the pandemic observed in previous years.

On the other hand, burnout is a syndrome that develops gradually as a function of chronic exposure to work stressors. Therefore, the search for early markers that can negatively impact personnel are relevant indicators to monitor. Interestingly, the results described here are useful as evidence for the presence of Emotional Exhaustion in healthcare personnel (see **Table 3**) and consistent with the literature. In a systematic review on worldwide evidence of burnout in healthcare personnel during 2020 and 2021, Brandao et al. (2022) agree in reporting that the main element present in the

studies corresponds to high levels of Emotional Exhaustion in healthcare personnel, and nurses in particular (present in 13 of 19 articles included in the review). On the other hand, Jakovljevic et al. (2021) coincide with the results of this study in showing high levels of Emotional Exhaustion, low levels of Depersonalization, and high levels of Personal Accomplishment, similar to that described in **Table 2**, despite reporting a lower level of burnout in nurses and doctors than in other personnel.

The literature suggests that burnout (Danet, 2021; Laris et al., 2022) and deterioration of mental health in healthcare workers (Alvarado et al., 2021) have a strong female bias. However, only a positive association trend was evidenced between women and Emotional Exhaustion (**Table 3**) and negative between women and Level of Personal Accomplishment (**Table 5**), without statistical significance. On the other hand, a significant association was found between living with a romantic partner and Emotional Exhaustion (**Table 3**), which coincides with the reported fear of healthcare personnel of infecting their loved ones (Alvarado et al., 2021).

The results presented here suggests that the most relevant factor associated with burnout early markers corresponds to the work environment. Consistently, the results presented in **Tables 3-5** agree in highlighting the relationship with the supervisor and the relationship with the work environment as critical factors in Emotional Exhaustion, Depersonalization, and Personal Realization (Toloza & Figueroa, 2022). Considering the workload associated with the stage of the pandemic described above, this information is an important input for the management of healthcare personnel, in order to promote adequate working conditions that guarantee good care for users.

The understanding of burnout syndrome has extended beyond academia, to the point that the World Health Organization (WHO) defines it as a condition characterized by physical and mental exhaustion resulting from the mismanagement of chronic stress situations at work. Interestingly, the WHO has decreed this syndrome as an occupational ailment, which holds the employer responsible for its prevention and/or mitigation (World Health Organization, 2019). Therefore, the study and understanding of work environments that can lead to burnout phenomena are active areas of research worldwide. This study represents the first measurement of burnout and its early markers in healthcare personnel of the public healthcare network in southern Chile, specifically in the Province of Osorno in the Los Lagos Region, contributing to the understanding of this phenomenon and its consequences on mental and physical health of workers during the COVID-19 pandemic.

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Author's Contributions

María Paz Contreras contributed to the study conception and design, data collection, and funding acquisition, as well as data interpretation and final manuscript revision. Antonio Vargas contributed to the study design, statistical analysis, data interpretation, and final manuscript revision. Jovan Kuzmicic contributed to the study design, statistical analysis, data interpretation,

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Corresponding author
Jovan Kuzmicic
e-mail: jovan.kuzmicic@ulagos.cl

Section editor
Prof. Dra. Mónica Díaz-Leiva