DOI: 10.1590/1413-81232020251.28832019




# Occupational fatigue and work absenteeism in female assistant nurses of a high-complexity hospital, Chile

Carolina Luengo Martínez (https://orcid.org/0000-0002-6541-3645) [1]
Sebastián Palma Moraga (https://orcid.org/0000-0001-8727-8141) [1]
Carla Sandoval Paredes (https://orcid.org/0000-0002-2481-0572) [1]
Amanda Sepúlveda Vásquez (https://orcid.org/0000-0003-0049-4541) [1]
Cristina Maccarena Villarroel Villarroel (https://orcid.org/0000-0001-6752-9062) [1]

**Abstract** *This research examined the association between occupational fatigue and work absenteeism in 110 female assistant nurses of a high-complexity hospital in Chile. A sociodemographic questionnaire and the Checklist Individual Strength (CIS) scale were used. The results showed that the predominant absenteeism range was 11-29 days. The highest means of fatigue occurred in those with seniority above 2 years, with more than 10 patients in charge and an annual contract. No significant difference was observed between the fatigue means concerning absenteeism, but a significant association was observed between physical fatigue ($p = 0.040$, $OR = 1.054$) and service seniority ($p = 0.001$, $OR = 1.084$) with work absenteeism. Finally, we can conclude that physical fatigue and seniority in the clinical service are significant risk factors for the occurrence of absenteeism.*

**Key words** *Fatigue, Nursing staff, Work absenteeism*

[1] Departamento Enfermería, Universidad del Bio-Bio. Avda. Andrés Bello 720, Casilla 447. 3800708 Región de Ñuble Chile. Chile. cluengo@ubiobio.cl

## Introduction

Occupational fatigue is understood as "a temporary loss of the ability to execute a job, following its prolonged performance"[1]. It is the third most prevalent symptom associated with poor health in working people in general, and one of the primary factors associated with morbidity[2]. It has an interdependent relationship with work since it is influenced by it, but in turn, it also has a direct impact on it. Increased fatigue levels of health personnel can elevate the likelihood of errors during patient care[3], generating dissatisfaction and complications such as ulceration, infections and falls[4], which is at the expense of user safety, compromising the quality of care, a situation especially relevant in nursing care, in which direct and often invasive care procedures are performed. Also, mistakes by fatigued workers can cause adverse effects with high community outreach, ranging from medical errors to car accidents[5]. Besides, occupational fatigue harms the employer since the effects of fatigue can also lead to higher occupational diseases and absenteeism rates[2,6]. The latter is a constant issue of concern in different organizations. One of the work areas with high rates of work absenteeism is in the health sector, which is a relevant reality in the Chilean public health sector[7]. Absenteeism can generate an adverse impact on institutional management[6] and is related to huge costs associated with the replacement of personnel and the benefits provided by health insurance entities to workers, which is how in Chile, these agencies have outlaid subsidies of more than 530 million pesos (CLP), only in replacement of medical leaves[8]. High costs have led companies to generate strategies to reduce high levels of absenteeism, which have been unsuccessful so far.

It should be noted that the most significant number of workers in the health area is dominated by assistant staff[9]. Among them, the highest concentration serves as nursing assistants, also known as paramedical technicians or nursing technicians, who are responsible for the implementation of basic nursing activities, and these professionals gather the most significant number of absenteeism cases[10]. This population consists mainly of women[11], with usually higher levels of absenteeism than men[12], and who are also subject to a higher level of burden since they respond both to their work obligations and family and domestic demands[13]. However, it is a rarely studied population, which has grown considerably in recent years, showing an increase of more than 23%[11,14], and is generally exposed to excessive workload and a fast and intense work pace[15]. These conditions of the health area can end up causing both physical and emotional wear[16], which can leave them more vulnerable to stress, fatigue, and exhaustion[17].

Therefore, considering the above, this study aims to determine the association between occupational fatigue and work absenteeism in female nursing assistants of a high-complexity hospital in Chile, under the assumption that the higher the level of occupational fatigue in nursing assistants, the higher their work absenteeism.

## Material and methods

A cross-sectional analytical study was conducted with a population of 146 female nursing assistants (NA), working in the Medicine, Surgery, and Neurology units of a high-complexity hospital in Chile. A final population of 110 NAs was achieved, which met the following inclusion criteria: a) NAs that also work on-call; b) who have been working at least 6 months in the service; and c) who agree to participate in this study by signing an informed consent form. Exclusion criteria were, being on medical leave, vacation, or legal permission on data collection, not answering the questionnaire in its entirety, and refusing to participate. Thus, 36 NAs were excluded because they had been working less than 6 months in the service (16.4%), refused to participate in the study (2.1%), and did not answer the questionnaire in its entirety (3.4%).

Two different instruments were used (self-administered, after reading the instructions) for the collection of information between April and May 2018, a sociodemographic and work data card to characterize the sample, where two questions were incorporated to assess work absenteeism: Have you been absent from work during the past 12 months? (YES/NO); if the answer was YES, the respondent was requested to answer: How many days have you been absent from work in the last 12 months? (Including administrative days, absence without leave, medical leave, and work accidents). As people tend to underestimate their absences[12], we decided to introduce an explanatory paragraph, which specified what aspects are considered in absenteeism. And the Checklist Individual Strength (CIS) to measure occupational fatigue. This instrument was adapted and validated for Chile in 2008 and reduced from 20 to 15 items[18]. In turn, these items are divided into two

Ciência & Saúde Coletiva, 25(1):243-249, 2020

subscales, which assess the perception of physical fatigue (Cronbach's α= 0.85) and the perception of cognitive fatigue (Cronbach's α= 0.78). The mean data was used to quantify fatigue, obtaining a score for general fatigue. Also, item 16 was included to assess self-perceived fatigue[19].

The research complied with the ethical guidelines for the investigation with human beings established in the decree-law 114 that approves the regulation of Law nº 20.120[20]. Also, we requested the approval of the Scientific Ethics Committee of the Hospital under study, as well as the director of said establishment. All participants read and signed two copies of the informed consent form, stressing that their participation is entirely voluntary, that the information collected is anonymous and confidential, and that they would not be adversely affected by refusing to participate.

Data descriptive analysis was performed using frequencies and percentages, mean and standard deviation, under the assumption of normality measured by Shapiro-Wilk's test. A one-way ANOVA test was calculated to correlate the study variables, under the assumption of normality and Kruskal-Wallis H when the data did not show normal distribution. A chi-square test was applied for two qualitative variables. A multiple binary logistic regression was made to test the hypothesis of the study, with a significance level of 0.05. The data analysis was managed with the statistical package SPSS version 15 in Spanish.

## Results

Regarding the distribution of work absenteeism of the study participants, 61% reported absenteeism at work (N = 67), and reported a period of absence ranging from 11 to 29 days.

Concerning general fatigue, the highest mean score with a tendency associated with showing higher general fatigue was evidenced in NAs aged 35-44 years, separated, earning a per capita economic income between $ 62,090 and $ 106,214 (CLP), female heads of household, those with at least 3 children and those who indicated having 3 or more people under their care. These observations are replicated in both physical and cognitive fatigue.

Now, concerning general fatigue by work characteristics, the participants who indicated they had 5-16 years' work experience as NAs, who have been working for 2-5 years in the same clinical service, who have more than 10 patients in charge and who work under a contract, were those who showed a higher mean score, tending to display more significant general fatigue, as is the case of the physical fatigue variable. In the latter, we found that the highest mean is shown in the staff that works on a fee basis. In cognitive fatigue, participants who work in medicine, with a total work experience of 5-16 years, who have been working in the same clinical service for more than 5 years, who have more than 10 patients in charge and are hired as plant staff, show a higher mean.

Concerning the relationship between occupational fatigue and work absenteeism (Table 1), no significant difference was found between the mean scores of general, physical, and cognitive fatigue regarding the four groups of work absenteeism.

A set of multiple type binary logistic regression equations were examined to test the hypothesis of the study, among which was the one shown in Table 2, which evidences that physical fatigue and years of clinical service experience was significantly associated with work absenteeism, with p = 0.040 and p = 0.001, respectively.

Concerning physical fatigue, an OR = 1.054 (95% CI: 1.003-1.109) was indicated, which is equivalent to saying that a one-point increase in this realm increases 1.05 times the risk of being absent from work. Then, the variable seniority in the clinical service showed an OR = 1.084 (95% CI: 1.032-1.139), so working for another year in the same clinical service increases 1.084 times the risk of being absent from work.

## Discussion

This study gives an account of the association between occupational fatigue and work absenteeism in female Nursing Assistants (NAs).

Concerning work absenteeism, we observed that a large part of the population reported being absent between 11 and 29 days, which is consistent with what was presented by Mesa and Kaempffer[21], where the mean number of absenteeism days in the hospital sector was 14.3 days. When analyzing general fatigue, we found that the of 35-44 years' age group had the highest means of general, physical, and cognitive fatigue. One might think that the oldest age group could tend to show a higher rate of fatigue, which was not the case. This may be because older people generally have less work overload since there is a greater

**Table 1.** Association between occupational fatigue and work absenteeism of study participants.

| Occupational fatigue | Work absenteeism (in days) | | | | p-value |
|---|---|---|---|---|---|
| | 1-10 (N = 17) | 11-29 (N = 24) | 30-60 (N = 10) | > 60 (N = 16) | |
| General fatigue | 47.53 ± 14.03 | 49.25 ± 15.27 | 54.20 ± 10.41 | 55.06 ± 19.25 | 0.447* |
| Physical fatigue | 28.88 ± 8.56 | 30.17 ± 9.73 | 30.20 ± 7.36 | 32.31 ± 11.79 | 0.788* |
| Cognitive fatigue | 18.65 ± 7.97 | 19.08 ± 8.30 | 24.00 ± 8.29 | 22.75 ± 8.96 | 0.226† |

*ANOVA test; † Kruskal-Wallis H-test.

**Table 2.** Binary logistic regression between work absenteeism concerning physical fatigue, cognitive fatigue, and seniority in clinical service.

| Independent variables | Coef. B | Typical error | Wald | p-value | OR | 95 CI% for OR | |
|---|---|---|---|---|---|---|---|
| | | | | | | Upper | Lower |
| Physical fatigue | 0.053 | 0.026 | 4.234 | 0.040 | 1.054 | 1.003 | 1.109 |
| Cognitive fatigue | -0.017 | 0.028 | 0.380 | 0.537 | 0.983 | 0.931 | 1.038 |
| Seniority in clinical service | 0.081 | 0.025 | 10.183 | 0.001 | 1.084 | 1.032 | 1.139 |
| Constant | -1.508 | 0.782 | 3.721 | 0.054 | 0.221 | | |

collaboration of their peers to perform tasks that require more physical effort. Regarding the marital status of the participants, we can see that the separated ones have a higher mean of general and physical fatigue. In this regard, Portero and Vaquero[22] mention that marriage does not have a significant influence on professional wear, but incidence would be marked by the partner's support.

As for the per capita economic income, those who report the lowest levels of fatigue are found in the groups that declared the lowest income. Then, having lower income would increase the concern of providing support for the family, covering all needs based on a low family budget. These results are reinforced by what was found by Ansoleaga et al.[23], who determined that distress (negative stress) was associated with economic tightness. On the other hand, participants who were considered heads of households had a higher mean in all types of fatigue, unlike those who were not. This could be because being head of household involves dealing with various responsibilities and participating in problem-solving, both at home and work. Many of the participants who are heads are not only responsible for the care of the home but also for the care of the husband and children, as well as job responsibilities, which could exacerbate role conflicts[13]. According to Díaz and Mauro[24], a large proportion of female workers in the health area report a very high workload, exceeding 60 weekly hours of domestic work and paid work, which could amount to more than 12 hours per week of unpaid work alone.

Concerning the number of children, those who had more children tended to have higher levels of fatigue compared to those without children. This situation is replicated in the number of people under their care, where participants who assume the role of caregiver of more people tend to have higher levels of fatigue than those who do not have people under their care. A directly proportional trend can be seen between the number of burdens and the mean fatigue. Seguel[19] states that the presence of children implies more significant fatigue for the nursing worker. As a matter of fact, the higher the number of children the nursing worker has, the higher the general, physical, and cognitive fatigue. This is consistent with what was found by Jones et al.[3], who stated that the presence of children was one of the factors that were significantly associated with a higher probability of manifesting a tired state. These results may be because attending to family and domestic demands, which include the care of children or a relative, can generate more considerable wear when added to labor demands.

In the same vein, the highest mean of general fatigue and the physical and cognitive subsca-

les emerged in those participants who had been working as NAs for 5-16 years. In this regard, a Cuban study found that total working time was associated with fatigue and stress[25]. On the other hand, participants with a higher number of patients under their care tend to have higher means of fatigue. Having fewer patients means fewer tasks to be performed and, thus, reduced physical effort.

Regarding the relationship between occupational fatigue and work absenteeism, although means for both the general fatigue scale and the physical fatigue subscale with days of absence tend to increase, the association is not significant. As for the subscale of cognitive fatigue, no association was found between the means and the days of absence. In their study on white-collar workers, Roelen et al.[26] found that prolonged fatigue is prospectively associated with long-term absence, which leads to disruption in proper work performance. In other studies by the same authors[2] on office employees, fatigue was associated prospectively, both with a high number of days of sick leave and with the number of episodes of absence during the 1-year follow-up. These studies coincide with what was found by Bultmann et al.[27] in a research conducted on Danish workers, which evidenced that the increase of one standard deviation in fatigue predicted a 16% increase in the risk of being absent due to illness. However, other analyses conducted in this same study found that fatigue is a strong and independent factor in predicting sickness absence in men, but not in women. This study did not explain why the relationship between fatigue and absenteeism was much more present in men than among women, although some theories were suggested, such that the reasons for fatigue are different for each gender. Also, the fact that men performed types of work incompatible with higher fatigue levels was added, such as those that required more physical effort, so when they felt fatigued, they could not adequately fulfill their work, which led them to be absent. The same situation did not occur in women since they are more successful when it comes to dealing with fatigue, which results in a better adaptation in their ability to work. Results like these lead us to think that, although fatigue does influence absenteeism, when we refer to females, they have other reasons that lead them not to attend their workplace.

The association between the head of household and work absenteeism was not significant. From this, it follows that being head of the household is an independent factor that does not lead to being absent. However, this can indirectly increase the days of absence since the tasks and responsibilities involved in being the head of the household can lead to other factors such as exhaustion, stress, among others. The multiple roles that must be carried out to meet both the household and work demands can cause excessive workload[19], and the latter is the trigger for absenteeism.

The analysis of the multiple binary logistic regression revealed that, of all the different tests that were performed, only physical fatigue and seniority in the clinical service were significantly associated with work absenteeism. Concerning physical fatigue, we found that an increase of one point in this dimension elevates 1.05 times the risk of being absent from work, a relationship that was not evident in cognitive fatigue. Thus, the hypothesis raised that "the higher the level of occupational fatigue in the NAs, the greater their work absenteeism", is partially accepted.

Another relevant finding was that working one more year in the same clinical service increases 1.084 times the risk of being absent from work, from which it can be deduced that it is a risk factor that can increasingly influence work absenteeism than the physical fatigue itself. Accordingly, a Norwegian study found that initial physical fatigue was significantly associated with high absence due to illness at one year of follow-up in psychiatric care, nursing home, and home care. However, this association was not reflected in mental fatigue[28], results that agree with this investigation. Also, the same study found that associations between fatigue and absence due to illness were strengthened when there was an increase in work demands and role conflict. Furthermore, Vera et al.[18], who studied fatigue in mining workers, performed a multiple linear regression model for age-adjusted physical and cognitive fatigue. A significant association ($p = 0.008$) between physical fatigue and the positive predictive capacity of the years working in the position emerged.

Finally, we can conclude that physical fatigue and seniority in the clinical service are a significant risk factor for absenteeism. Thus, further studies are required on the subject and in this unit of analysis as a fundamental member of the nursing team.

## Collaborations

CL Martínez participated in the conception and design of the work, analysis, and interpretation of data, drafting of the manuscript, critical review of the manuscript, provided statistical and administrative advice, and approved its final version. The authors SP Moraga, CS Paredes, AS Vásquez, CM Villarroel, participated interchangeably in the conception and design of the work, collection, and achievement of the results, analysis, and interpretation of data, drafting of the manuscript, critical review of the manuscript and approved its final version.

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Article submitted 03/04/2019
Approved 20/08/2019
Final version submitted 03/10/2019