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Factors associated with compassion satisfaction and compassion fatigue among nursing professionals

Fatores associados à satisfação e fadiga de compaixão em profissionais de enfermagem

Factores asociados a la satisfacción y fatiga por compasión en profesionales de Enfermería

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ABSTRACT

Objective: to analyze the association between compassion satisfaction and compassion fatigue with sociodemographic and occupational factors among nursing professionals. **Method:** cross-sectional analytical study conducted between August and December 2023 with 95 hospital nurses in the Midwest region of Brazil, using the Professional Quality of Life Scale. Data were analyzed with T-tests, ANOVA, and multiple linear regression. Ethical standards were observed. **Results:** high levels of compassion satisfaction (>42 points) and moderate levels of compassion fatigue (>23 points) were identified. Length of professional training up to five years and family income between six and fifteen thousand reais were associated with lower compassion satisfaction (11.7% of variance; p=0.006). Being a nurse and reporting negative, good, or fair working conditions were associated with higher compassion fatigue (10.9% of variance; p=0.009). **Conclusion:** adequate levels of professional quality of life were observed, with high compassion satisfaction and moderate compassion fatigue. Reductions in compassion satisfaction and increases in compassion fatigue were associated with sociodemographic and occupational variables.
Descriptors: Hospitals, University; Nurse Practitioners; Compassion Fatigue; Epidemiologic Factors.

RESUMO

Objetivo: analisar a associação entre satisfação por compaixão e fadiga de compaixão com fatores sociodemográficos e laborais em profissionais de enfermagem. **Método:** estudo transversal, analítico, realizado entre agosto e dezembro de 2023 com 95 profissionais de enfermagem hospitalares do Centro-Oeste brasileiro, utilizando a Escala de Qualidade de Vida Profissional. Dados analisados com testes T, ANOVA e regressão linear múltipla. Respeitados os aspectos éticos. **Resultados:** houve alta satisfação por compaixão (>42 pontos) e níveis moderados de fadiga de compaixão (>23 pontos). Tempo de formação de até cinco anos e renda familiar entre seis e 15 mil reais associaram-se à menor satisfação por compaixão (11,7% da variância; p=0,006); ser enfermeiro e percepção negativa ou boa/razoável das condições de trabalho à maior fadiga de compaixão (10,9% da variância; p=0,009). **Conclusão:** observou-se níveis adequados de qualidade de vida profissional, com elevada satisfação por compaixão e níveis moderados de fadiga de compaixão. Reduções na satisfação por compaixão e aumentos na fadiga de compaixão estiveram associados a variáveis sociodemográficas e laborais.
Descritores: Hospitais Universitários; Profissionais de Enfermagem; Fadiga de Compaixão; Fatores Epidemiológicos.

RESUMEN

Objetivo: analizar la asociación entre la satisfacción por la compasión y la fatiga por compasión con los factores sociodemográficos y laborales en profesionales de enfermería. **Método:** estudio analítico transversal realizado entre agosto y diciembre de 2023 con 95 profesionales de enfermería hospitalarios de la Región Centro-Oeste de Brasil, utilizando la Escala de Calidad de Vida Profesional. Los datos se analizaron con pruebas t, ANOVA y regresión lineal múltiple. Se respetaron las consideraciones éticas. **Resultados:** se observó una alta satisfacción por la compasión (>42 puntos) y niveles moderados de fatiga por compasión (>23 puntos). Un tiempo de formación de hasta cinco años y un ingreso familiar entre R$6.000 y R$15.000 se asociaron con una menor satisfacción por la compasión (11,7% de la varianza; p=0,006); ser enfermero y tener una percepción negativa o buena/regular de las condiciones laborales se asociaron con una mayor fatiga por compasión (10,9% de la varianza; p=0,009). **Conclusión:** se observaron niveles adecuados de calidad de vida profesional, con alta satisfacción por compasión y niveles moderados de fatiga por compasión. Las reducciones en la satisfacción por la compasión y los aumentos en la fatiga por compasión se asociaron con variables sociodemográficas y laborales.
Descriptores: Hospitales Universitarios**;** Enfermeras Practicantes; Desgaste por Empatía; Factores Epidemiológicos.

INTRODUCTION

Nursing professionals represent 59% of healthcare workers worldwide[1] and are an essential workforce, as they provide direct and continuous care to patients while coordinating care actions with other professionals to ensure necessary assistance and comprehensive care[2]. Among nursing professionals, those working in hospital settings are exposed to numerous factors that may affect their physical and mental health as well as quality of life[3,4], such as work overload,

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physical demands, irregular schedules, and at times harmful working conditions[5,6], since these environments predominantly involve specialized and critical care for individuals facing suffering and death[6].

This reality requires these professionals to manage multiple demands in addition to the constant mobilization of empathy and compassion. Such demands stem from the inherent characteristics of the profession, which subjects them daily to patients' physical pain, emotional suffering, and trauma[7,8], making them particularly vulnerable to an imbalance in their professional quality of life (PQL)[9].

PQL reflects the relationship between the positive and negative effects of work on caregivers, combined with the psychological and organizational resources available to overcome the impacts of these experiences[8,9]. Within the professional quality of life model (ProQoL), developed by Stamm[9], compassion satisfaction (CS) represents the positive dimension, whereas compassion fatigue (CF) corresponds to the negative dimension. These two components are interrelated, and PQL results from the balance between CS and CF, reflecting overall well-being in the workplace[9,10].

CF arises from the harmful consequences of constant compassionate engagement, worsened by an unbalanced work environment. It manifests in two symptomatic aspects: burnout and secondary traumatic stress (STS)[9,10]. Burnout refers to a reduced empathic capacity resulting from depersonalization, while STS represents distress associated with low resilience to emotional stress in the workplace[8]. Combined, these factors impair the professional's ability to provide compassionate care, characterizing the development of CF[8-11].

Conversely, CS also highlights the beneficial aspect of compassionate care, referring to the sense of fulfillment derived from providing care that alleviates the suffering of others[7,9,10,12]. High levels of CS have been associated with perceived well-being, self-efficacy, positive workplace relationships, and lower CF scores[7,9,12].

Systematic reviews have shown moderate-to-high scores of CF and CS[4,12], with prevalence rates of approximately 50% (48% and 53%, respectively) among nursing professionals, as well as a progressive increase in CF levels, particularly after 2010[7]. These findings further indicate that sociodemographic characteristics and work-related factors such as sex, occupation, educational attainment, work sector, and mental health status are associated with PQL components, CS, and CF[4,7,12].

An imbalance in PQL arises from reduced CS indices and increased CF indices, damaging both professional health and the quality of care delivered[9]. High CF levels among nursing professionals are linked to progressive desensitization to patients' experiences, resulting in a decline in care quality, more clinical errors, heightened symptoms of depression and anxiety disorders, absenteeism associated with stress, and a sense of devaluation in the workplace[2,4,7,12].

Despite the relevance of the subject and its potential effects on both professionals' health and nursing care delivery, few Brazilian studies have explored CS and CF in hospital nursing professionals and their related factors. Some investigations reported variable scores, with more frequent findings of low CF and high CS, without significant correlations with sociodemographic variables[13,14]. Others indicated moderate CF levels associated with occupational setting and professional category[15,16], as well as high CF levels within the burnout component, linked to poorer perceptions of safety culture[2], and within STS, related to workplace violence[17].

Further investigations are essential to better understand CS and CF levels and their associated variables in light of the specificities of the Brazilian context. A deeper examination of this phenomenon may assist hospital managers in planning strategies to improve nursing professionals' PQL.

Based on the hypothesis that sociodemographic factors such as income, educational attainment, sexual orientation, and religious practice, in addition to work-related factors including professional category, years of practice, and perceptions of work characteristics, are associated with CS and CF, this study aimed to analyze the association between compassion satisfaction and compassion fatigue with sociodemographic and occupational factors in nursing professionals.

METHOD

This analytical cross-sectional study, guided by the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE)[18], was conducted in a medium-sized public university general hospital, located in a Brazilian state capital. The institution has been part of the hospital care network of the Brazilian Hospital Services Company (EBSERH) since 2013 and served as a referral center for severe Covid-19 cases in the Midwest of Brazil.

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Data collection took place from August to December 2023. To reach all potential participants, regular visits were conducted in all sectors and shifts, along with weekly reminders sent by electronic mail (e-mail).

The study population included all nursing professionals (nurses and nursing technicians) working in the institution during data collection (n=367), who were invited to participate regardless of area or function, thus characterizing a non-intentional sample. Eligibility required at least six months of professional practice; respondents who provided incomplete answers were excluded.

Before performing inferential analyses, a sample power calculation was carried out (GPower 3.1.9.7) for multiple linear regression, considering a small effect (0.08), significance level of 95%, power of 80%, and up to four predictors. Results indicated that the obtained sample size was sufficient to ensure statistical validity and reduce the risk of Type II error.

Data collection was performed by the principal investigator using an electronic form developed with Google Forms®. The form included the Informed Consent Form (ICF), in which volunteers had to select the corresponding dialog box for the option "yes," indicating awareness of the terms and agreement to participate. After confirmation, participants gained access to the questionnaire, with an estimated completion time of 20 minutes. A copy of the form, including the ICF was automatically forwarded to participants by e-mail; however, the form itself did not store electronic addresses. Data organization was carried out by a researcher who did not participate in the analytical stage, thereby preserving confidentiality and anonymity of participants throughout the study.

Study disclosure was conducted by research team members through visits to all clinical and outpatient sectors during all working shifts. Folders containing a QR code linked to the form were distributed, and the form was also sent to participants by institutional e-mail or instant messaging application through the nursing management and the hospital's social communication department. Data collection and dissemination lasted four months, with weekly invitations sent to participants who had not yet responded.

The Professional Quality of Life Scale (ProQoL)[9] was employed to assess CS and CF levels. The version translated and validated for the Brazilian context[10], was applied, adapted from the fourth version of the scale, containing 28 items distributed into two subscales: the Compassion Satisfaction (CS) subscale with 15 items, and the Compassion Fatigue (CF) subscale subdivided into burnout with 3 items, and Secondary Traumatic Stress (STS) with 10 items. Responses followed a 5-point Likert scale ranging from 0 (never) to 5 (always)[10].

Final scores for CS and CF domains were obtained by summing their respective items, ranging from 0 to 75 points, where higher scores indicated a stronger presence of the phenomenon. Cutoff points were fixed around the 25th and 75th percentiles based on the database[9]. PQL is not represented by a single score, but rather by CS and CF subscale scores, and interpretation must take into account the balance between both components. Moderate to high CS levels (> 25th percentile) associated with low CF levels (< 25th percentile) are indicative of good/adequate professional quality of life[9,10]. Subscale reliability was evaluated using McDonald's Omega, showing strong internal consistency indicators for the studied sample (CS = 0.831; STS = 0.879; Burnout = 0.736).

In addition, a sociodemographic and occupational questionnaire was designed for participant characterization, collecting information such as gender, age, race/skin color, sexual orientation, marital status, number of children, income, educational attainment, religion, occupation, work sector, type of professional-patient involvement, work shift, years of training, weekly workload, employment bond, activity during the Covid-19 pandemic, days absent from work in the past year, and perception of work characteristics. The questionnaire also included subjective questions regarding participants' perceptions of physical, mental, and occupational health conditions.

Data were extracted from Google Forms® and double-checked before transfer to the statistical software, where descriptive and inferential analyses were performed. In descriptive analysis, continuous variables were expressed as mean and standard deviation, while categorical variables were described as absolute and relative frequencies. Comparative analyses between mean CS and CF scores and dichotomous sociodemographic and occupational variables were performed using independent-sample t tests, with variance homogeneity assumption verified through Levene's test. For polytomous variables, analysis of variance (ANOVA) was applied to identify group mean differences, with the post-hoc Games-Howell test adopted.

Due to the relatively small sample size, interpretation of relevant variables was based on effect size magnitude, with moderate or large effects considered relevant regardless of p-values, which may be influenced by Type I error. Effect size measures included Glass's delta for t tests and eta squared for ANOVA. Comparisons

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among continuous variables were carried out using Pearson's correlation test. For all these analyses, 95% confidence intervals were obtained using bootstrapping with 1,000 resamplings. This technique, known as bias-corrected and accelerated confidence intervals (BCaCI), was applied because it provides more reliable results and corrects deviations from normality in sample distribution and group size differences[19].

In addition, multiple analyses of associated factors were conducted using multiple linear regression. For model construction, all explanatory variables with $p < 0.20$ or moderate/large effect sizes in bivariate analysis were tested and entered simultaneously using the backward method. Non-significant variables in multiple analysis were removed one by one, with only those with $p < 0.05$ retained in the final model. Before confirming the final model, assumptions for multiple linear regression were verified, including normality of residual distribution, absence of multicollinearity with Variance Inflation Factor (VIF) below 10, and absence of autocorrelation among residuals tested through Durbin-Watson statistics. Analyses were processed in the Statistical Package for the Social Science (SPSS), version 27.

In compliance with ethical requirements, the study protocol was approved by the Research Ethics Committee of the proposing institution. All participants provided consent in the ICF, ensuring anonymity and the possibility of withdrawal at any stage without constraints.

RESULTS

Adherence consisted of 100 professionals (27.4%), of whom five were excluded for not meeting the criteria, resulting in a final sample of 95 participants. The sociodemographic characteristics of nursing professionals were, as follows: female gender (83.2%), older than 40 years (55.8%), black or brown skin color (63.2%), heterosexual orientation (89.5%), with a partner (60.0%), more than two children (43.2%), monthly income between six and 15 thousand reais (61.1%), postgraduate education (61.1%), and religious practice (89.5%). These professionals showed high CS scores ($\bar{x}$ = 52.89) and moderate CF scores ($\bar{x}$ = 23.86), interpreted according to the 25th and 75th percentiles of the database. Table 1 presents the analysis of mean CS and CF score differences according to the sociodemographic variables of nursing professionals.

Table 1: Comparison of mean compassion satisfaction and compassion fatigue scores with sociodemographic variables among a sample of nursing professionals (n = 95). Cuiabá, MT, Brazil, 2024.

Sociodemographic variables	n (%)	Compassion satisfaction					Compassion fatigue				
		Mean (SD*)	Test t/F†	p	BCaCI 95%‡	Effect size	Mean (SD*)	Test t/F†	p	BCaCI 95%‡	Effect size
Gender											
Female	79 (83.2%)	53.05 (5.31)	0.619	0.538	-2.04; 3.90	0.18	24.01 (13.56)	0.244	0.764	-5.78; 7.53	0.07
Male	16 (16.8%)	52.12 (6.14)					23.12 (11.63)				
Age (median)											
<40 years old	42 (44.2%)	52.05 (6.80)	-1.282§	0.195	-3.88; 0.85	0.22	24.55 (13.65)	0.448	0.665	-4.64; 6.54	0.09
≥40 years old	53 (55.8%)	53.57 (4.00)					23.32 (12.95)				
Skin color‖											
White	34 (35.8%)	53.03 (5.54)	0, 238†	0, 812	-1.95; 2.42	0.05	23.73 (12.46)	-0.128†	0.899	-6.03; 5.30	0.03
Black or Brown	60 (63.2%)	52.75 (5.44)					24.10 (13.75)				
Asian	01 (1.1%)	57.00 (-)					14.00 (-)				
Sexual orientation											
Heterosexual	85 (89.5%)	53.22 (5.08)	1.736	0, 197	-1.75; 7.95	0.61	22.89 (12.95)	-2.124	0.048	-17.51; 1.49	- 0.71
Minority orientations	10 (10.5%)	50.10 (7.65)					32.10 (13.12)				
Marital status											

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With partner	57 (60.0%)	52.70 (4.79)	-0.399 §	0.683	-3.04; 1.87	0.07	22.28 (12.53)	-1.439	0.168	-9.25; 1.38	0.32
Without partner	38 (40.0%)	53.18 (6.35)					26.24 (13.99)				
Number of children											
No children	28 (29.5%)	51.57 (6.97)	2.374 †	0.099	-	0.05 η2	27.14 (14.10)	1.273†	0.285	-	0.03 η2
01 child	26 (27.4%)	52.19 (5.91)					23.08 (14.56)				
> 2 children	41 (43.2%)	54.24 (3.40)					22.12 (11.24)				
Family income											
< R$6000.00	26 (27.4%)	53.92 (4.20)	3.208 †	0.045 ¶	-	0.06 η2	24.38 (12.02)	0.347†	0.708	-	0.01
R$6000.00–R$15000.00	58 (61.1%)	51.88 (6.04)[a]					24.22 (13.90)				
> R$15000.00	11 (11.3%)	55.81 (2.68)[a]					20.72 (12.84)				
Schooling											
Technical Level	8 (8.4%)	56.00 (3.78)	2.289 †	0.107	-	0.05 η2	23.62 (16.90)	0.617†	0.542	-	0.01 η2
Rating	29 (30.5%)	53.65 (3.88)					21.65 (13.62)				
Graduate Studies	58 (61.1%)	52.09 (5.44)					25.00 (12.55)				
Religion											
Yes	85 (89.5%)	53.22 (5.05)	-1.237 §	0.244	-8.25; 2.10	0.62	23.73 (13.57)	0.286	0.708	-4.58; 8.37	0.09
No	10 (10.5%)	50.10 (7.80)					25.00 (10.07)				

Reference: *Standard deviation; †F statistic, ANOVA test; ‡ Bias-corrected and accelerated 95% Confidence Interval; ** Effect size (Glass's delta for independent-sample *t* tests and eta squared for ANOVAs); § Non-homogeneous variances detected by Levene's test; || Independent-sample t test comparing "White" and "Black or Brown" groups due to low frequency in the "Asian" group; ¶ Statistically significant group differences identified by post-hoc Games-Howell test (equal letters indicate different means).

It was observed that, for CS, the variables sexual orientation, family income, and religion were the sociodemographic factors with greatest clinical or practical significance, showing moderate effect sizes (d = 0.61, η2 = 0.07, and d = 0.62, respectively). Nursing professionals identifying with minority sexual orientations presented lower CS levels compared with those who identified as heterosexual; those with monthly income between 6 and 15 thousand reais had lower CS levels compared with those earning more than 15 thousand reais; and those reporting no religion showed lower CS levels compared with those with some religious practice.

For CF, only sexual orientation showed clinical significance with a moderate effect size (d = 0.71), indicating that nursing professionals from minority sexual orientations had higher CF levels than their counterparts.

In relation to the occupational variables, the sample showed a homogeneous distribution in terms of occupation, with 50.5% of nurses. Nursing professionals worked mainly in direct patient care (89.5%), mostly during daytime (74.7%), had more than 10 years since graduation (80.0%), weekly workload up to 40 hours (60.0%), employment under labor law contract (77.9%), with most allocated to critical care units (43.2%). Furthermore, most reported having worked in patient care during the Covid-19 pandemic (73.7%), having been absent from work up to 14 days (54.7%), and the majority expressed a positive perception regarding work characteristics (86.3%).

The results of the bivariate analysis are presented in Table 2.

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Table 2. Comparison of mean compassion satisfaction and compassion fatigue scores with occupational variables among a sample of nursing professionals (n = 95). Cuiabá, MT, Brazil, 2024.

Work variables	n (%)	Compassion satisfaction					Compassion fatigue				
		Mean (SD*)	Test t/F†	p	BCaCI95%	Effect size**	Mean (SD*)	Test t/F†	p	BCaCI95%	Effect size**
Occupation											
Nursing technicians	47 (49.5%)	53.98 (3.92)	1.960§	0.040	0.21; 4.21	0.55	20.55 (11.89)	-2.483	0.014	-11.98; -1.17	0.55
Nurses	48 (50.5%)	51.83 (6.46)					27.10 (13.75)				
Direct patient care											
Yes	85 (89.5%)	53.09 (5.20)	-1.042	0.426	-8.10; 2.29	0.36	23.45 (13.30)	0.869	0.358	-4.49; 11.80	0.29
No	10 (10.5%)	51.20 (7.31)					27.30 (12.51)				
Work shift											
Day	71 (74.7%)	53.05 (5.65)	0.496	0.595	-1.61; 2.97	0.11	22.91 (12.83)	-1.206	0.231	-10.71; 3.20	0.29
Night	24 (25.3%)	52.41 (4.83)					26.67 (14.17)				
Years since graduation											
< 5 years	07 (7.4%)	53.14 (4.37)	4.874†	0,010||	-	0.10 η2	27.14 (16.01)	2.182†	0.119	-	0.04 η2
5 - 10 years	12 (12.6%)	48.50 (8.84)[a]					30.50 (12.74)				
> 10 years	76 (80.0%)	53.56 (4.53)[a]					23.86 (13.20)				
Weekly workload											
Up to 40h	57 (60.0%)	52.77 (6.21)	0.046†	0.955	-	0.02 η2	23.26 (13.67)	1.143†	0.323	-	0,01η2
40–60h	18 (18.9%)	52.95 (3.60)					27.94 (12.15)				
> 60h	20 (21.1%)	53.20 (4.56)					21.90 (12.59)				
Employment bond											
Effective	14 (14.7%)	50.92 (6.62)	1.075†	0.346	-	0.02 η2	22.00 (11.22)	0.221†	0.802	-	0.01 η2
Labor Law contract	74 (77.9%)	53.23 (5.30)					24.03 (13.56)				
Graduate Studies	07 (7.4%)	53.28 (4.11)					25.86 (14.43)				
Work sector											
Hospitalization	34 (35.8%)	53.23 (4.40)	0.837†	0.477	-	0.03 η2	21.91 (11.17)	0.715†	0.546	-	0.02 η2
Critical care	41 (43.2%)	52.80 (5.86)					24.58 (14.45)				
Outpatient	07 (7.4%)	55.00 (4.83)					21.85 (13.48)				
Management	13 (13.7%)	51.15 (6.79)					27.77 (14.30)				
Worked during Covid-19											
Yes	70 (73.7%)	53.12 (5.67)	-0.699	0.486	-3.29; 1.59	- 0.16	23.99 (16.64)	-0.151	0.434	-6.60; 5.67	0.03
No	25 (26.3%)	52.24 (4.78)					23.52 (12.15)				
Days absent from work in the last year											
Not at all	37 (38.9%)	53.59 (4.97)	2.023†	0.138	-	0.04 η2	21,08 (14,69)[a]	3.100†	0,050||	-	0.06 η2
Up to 14 days	52 (54.7%)	52.86 (5.09)					24,58 (11,95)[b]				

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> 14 days	06 (6.3%)	48.83 (9.49)					34,83 (7,78)[ab]				
Perception of work characteristics											
Poor	09 (9.5%)	51.78 (6.55) [a]	2.416†	0.095[||]	-	0.05 η2	28.44 (14.73)[a]	3.965†	0.022||	-	0.08 η2
Good	82 (86.3%)	52.74 (5.32)[b]					24.17 (12.80)[b]				
Excellent	04 (4.2%)	58.50 (1.29)[ab]					7.25 (5.31)[ab]				

Reference: *Standard deviation; †F statistic, ANOVA test; ‡Bias-corrected and accelerated 95% Confidence Interval; **Effect size (Glass's delta for independent-sample t tests and eta squared for ANOVA), §Non-homogeneous variances detected by Levene's test; ||Statistically significant differences among groups identified by post-hoc Games-Howell test (equal letters indicate different means).

Occupation and years of professional practice presented moderate effect sizes for CS (d = 0.55 and η2= 0.10, respectively). Nurses had lower CS scores compared with nursing technicians, and those with more than 10 years since graduation obtained higher CS scores than professionals with an intermediate level of experience (5–10 years).

For CF, relevant effect sizes were identified in relation to occupation (d = 0.55), number of days absent from work (η2= 0.06), and negative perception of work characteristics (η2= 0.08). Regarding these associations, nurses presented higher CF levels compared with nursing technicians; professionals absent for longer periods (> 14 days) showed higher CF than those with no absence or up to 14 days of absence. Nursing professionals reporting a negative perception of the nature of their work had higher CF scores than those with a positive perception (good or excellent).

The results of the multiple linear regression analysis conducted using the backward method are presented in Table 3.

Table 3: Predictive models by multiple linear regression for factors associated with compassion satisfaction and compassion fatigue in a sample of nursing professionals. Cuiabá, MT, Brazil, 2024.

Variables	B	Standard Error	β	BCaIC95%		p value	VIF
				Min	Max		
Compassion satisfaction							
Intercept	48.939	1.819		45.324	52.554	< 0.001	
Years since graduation (1–5 years)	-4.671	1.720	-0.287	-8.062	-1.281	0.007	1.168
Family income (R$6000.00–R$15000.00)	-2.191	1.100	-0.198	-4.377	-0.006	0.047	1.046
Compassion fatigue							
Intercept	41.094	7.997		25.204	56.984	< 0.001	
Perception of work characteristics (poor)	21.889	7.545	0.488	6.896	36.811	0.005	2.985
Perception of work characteristics (good or reasonable)	19.028	6.430	0.498	6.252	31.804	0.004	2.986
Professional category (nurse)	7.973	2.851	0.303	2.308	13.638	0.006	1.242

Reference: Method of entry: backward; CS model (adjusted R^2 = 0.117; F = 3.487, p = 0.006; Durbin-Watson = 1.706). CF model (adjusted R^2 = 0.109; F = 3.297, p = 0.009; Durbin-Watson = 1.910). Effects controlled by gender, age, and professional category. VIF (Variance Inflation Factor).

It was demonstrated that, among the sociodemographic and occupational variables analyzed, only years since graduation and family income were significantly associated with CS. The multivariate model showed that nursing professionals with one to five years of experience and those reporting monthly family income between six and 15 thousand reais presented lower CS levels compared with their counterparts. The final model was statistically significant (F = 3.487, p = 0.006, adjusted R^2 = 0.117), indicating that the retained variables explained 11.7% of the outcome.

For CF, the multiple linear regression model showed that the perception of work characteristics in nursing and professional category were significantly associated with this outcome. Participants reporting a poor or good/reasonable perception of work characteristics, as well as those in the nurse category, presented higher CF levels compared with their counterparts. The final model was statistically significant (F = 3.297, p = 0.009, adjusted R^2 = 0.109), indicating that the retained variables explained 10.9% of the outcome.

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DISCUSSION

This study analyzed factors associated with CS and CF in nursing professionals working in a Brazilian university hospital. Findings revealed high CS levels (> 42 points) and moderate CF levels (> 23 points), suggesting an adequate PQL since, although participants experienced CF, they still maintained high CS levels. This indicates that nursing professionals may sustain well-being and optimism regarding their efficacy at work and willingness to contribute to improving the work environment[8,14].

These results corroborate national studies with similar populations, which also reported high CS and moderate CF scores[14,16]. However, in relation to global data, a meta-analysis assessing 28,509 nursing professionals indicated that both CS and CF reached moderate levels according to ProQoL, with mean scores of 33 and 25, respectively[12]. A systematic review[4] also reported high CF and moderate CS in nursing professionals.

CS represents positive feelings associated with accomplishing meaningful work, and higher scores in this subscale suggest greater contentment with professional performance[8,12,20]. Factors such as fulfillment at work, positive connections with patients and colleagues, favorable perception of work characteristics, family and organizational support, coping strategies and self-care, as well as balance between personal life and professional duties, have been associated with higher CS levels among nursing professionals[7,11,12,21].

Beyond satisfaction with their work, the high CS levels observed in this sample may also indicate the presence of positive coping strategies, such as resilience and a sense of vocational fulfillment[22-24].

In addition, the difference in CF scores found in this study, compared to meta-analytic results, may be explained by high CS scores, since CS functions as a moderator of PQL, mitigating the risk of experiencing CF[7,10,16,25]. Another explanation may be the nature of the sample itself, as nursing professionals experiencing psychological distress are less likely to volunteer in research[26]. Moreover, participants worked in a public university hospital offering educational and research environments, professional training programs, and stable employment, a context that could contribute to higher CS scores.

In contrast, studies have demonstrated that working in private hospitals exposes nursing professionals to a greater number of stressors, including low salaries, extended shifts, precarious work arrangements, and organizational factors specific to nursing, as well as variations in health systems across countries[2,27].

Multivariate analysis results showed that years since graduation up to five years and family income between six and 15 thousand reais negatively influenced CS scores, indicating that these variables contributed to lower CS. Literature consistently shows that nursing professionals with fewer years of professional experience are more vulnerable to reduced PQL due to greater exposure to secondary traumatic stress, resulting from a still immature emotional adaptation capacity and intense identification with patients' suffering[12,21,26]. Added to this is work overload and responsibilities, which expose professionals to negative emotions such as exhaustion, frustration, and stress, leading to reduced self-efficacy and limiting CS expression[17,20,22,24].

Nursing professionals reporting family income between six and 15 thousand reais, classified as intermediate based on sample stratification, had lower CS scores. Satisfaction with income and higher salaries have been associated with higher CS scores[23], since low remuneration correlates with reduced motivation, lower job satisfaction, and greater intent to leave the profession, which directly contributes to reduced CS[7,23]. In addition, remuneration enabling access to leisure, education, healthcare, personal development, and financial security is directly associated with psychological well-being[5].

However, the lowest income group (up to six thousand reais) did not present a significant negative effect on CS scores. This finding may be explained by the fact that greater expectations, work demands, productivity, and occupational stress are associated with higher salaries[20]. Another possibility is that a sense of purpose and fulfillment, as well as permanent employment bonds and labor rights guarantees, common among lower-income professionals, may positively influence QVL and outcomes in the CS subscale[5,7].

As indicated in the conceptual framework of PQL[9], multivariate analysis results demonstrated that occupational variables such as perception of work characteristics and professional category significantly contributed to CF. CF arises from the multidimensional experience of providing care and is directly linked to exposure to secondary trauma. Work stress and conflicting environments also contribute to burnout and STS, resulting in elevated scores in the CF subscale[2,7,8,16,25].

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Regarding professional category, recent studies have shown that nurses may be more vulnerable to CF given increased physical and psychological stress at work. This is associated with growing demands both in volume and quality of care delivered by nursing teams[12]. Stressors such as excess duties and insufficient time to execute them are strongly linked to higher CF scores and poor PQL[16,27].

Alongside patient care duties, nurses also perform administrative, managerial, and supervisory roles, which impose additional responsibility, thereby yielding higher CF scores[8,25,27]. Tasks requiring high responsibility, technical expertise, and rapid decision-making tend to affect nurses' emotional state, leading to feelings of overload and reduced work satisfaction[14]. This explains why nurses presented higher CF scores compared with nursing technicians.

It is fundamental to recognize that work characteristics such as safety in physical, chemical, and biological environments, interpersonal relations, organizational climate, and structural aspects of work (division of tasks, hierarchy, workload pace and length, power relations, responsibilities, workload, and social support) may influence workers' health and well-being. These elements affect professional activity dynamics and relational structures[2,5,28]. In nursing, work has been shaped by neoliberal policies that generate devaluation, loss of social and labor rights, long unregulated shifts, lack of minimum wage regulations, and constant demand for productivity and quality. These demands occur under staff shortages and inadequate preventive measures, resulting in physical and mental illness[5,28].

Thus, work characteristics dynamically interact with burnout, especially in hospital settings. Precarious work conditions in nursing have been decisive in professionals' illness and care deficits, since work is not only a means of financial subsistence but also a source of fulfillment and socialization[2,5,27,28]. Moreover, hostile relations among coworkers, managers, and ineffective teamwork may worsen work environments, intensify STS exposure, and contribute to worse PQL outcomes[2,7,17,20,27,29].

Despite high CS scores, participants remain at risk of developing CF. Therefore, improving the organizational and ethical climate of work environments may strengthen professionals' connection with their values, enabling them to foster compassion in patient care[29]. Research indicates that efficient management models, reasonable allocation of human resources, implementation of safety management, healthy work environments, investment in teamwork, and mental health interventions during crises may enhance positive experiences in nursing[2,12,29]. Such initiatives may prevent cumulative effects of secondary trauma, decrease workload stress, reduce CF, and optimize both PQL and care outcomes[22,30].

It is important to highlight the need for continuous monitoring of PQL indicators since approximately 70% of professionals in this study worked on the frontline during the pandemic. Evidence shows that this factor contributed to increased long-term risks of adverse mental health outcomes[3,28,30].

Study limitations

This study presents some limitations, among them the cross-sectional design, which prevents establishing causal and temporal relationships among variables. The use of self-administered questionnaires should also be noted, adopted for its flexibility, allowing participants to respond at the most convenient time within their work routine and without direct researcher presence. However, this approach is susceptible to self-report bias, which may be influenced by factors such as cognitive processes and social desirability, constituting a limitation of the study.

The small sample size may also be considered a limitation, restricting generalizability and increasing the likelihood of sampling errors. Nevertheless, to mitigate this, analyses focused on effect size measures to demonstrate clinical and practical relevance of the findings.

Despite these limitations, this study advances knowledge by identifying factors related to CS and CF, providing hospital managers with evidence that may contribute to the development of more targeted and effective strategies for promoting mental health, professional recognition, and improvement of nursing work conditions.

CONCLUSION

Data from this study revealed that nursing professionals from a Brazilian university hospital presented high levels of compassion satisfaction (> 42 points) and moderate levels of compassion fatigue (> 23 points), with nurses being the most affected category. The findings support the initial hypothesis, indicating that sociodemographic

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and occupational factors were associated with CS and CF levels in nursing professionals, with evidence of practical significance.

Lower CS scores were associated with years since graduation up to five years (p = 0.007) and intermediate family income (p = 0.047), explaining 11.7% of the outcome for this component (p = 0.006). The variables favorable perception of work characteristics (p = 0.005), reasonable/poor perceptions (p = 0.004), and professional category of nurses (p = 0.006) were associated with higher CF subscale scores, explaining 10.9% (p = 0.009) of the outcomes retained.

These findings highlight the importance of ensuring adequate working conditions, continuous monitoring of professionals' well-being, and recognition of the professional category. Future studies are recommended to investigate individual and organizational coping strategies aimed at strengthening PQL.

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Authors' contributions

Conceptualization, M.C.W.M. e M.N.B.; methodology, M.C.W.M, M.N.B. e M.K.; software, M.K.; validationM.C.W.M., M.N.B., L.A.R. e M.K.; formal analysis, M.C.W.M, M.N.B e M.K.; investigation, M.C.W.M e V.H.M.S; resources, M.C.W.M.; data curation, M.C.W.M e M.K; manuscript writing, M.C.W.M., M.N.B., M.K., L.A.R. e V.H.M.S.; review and editing, M.C.W.M., M.N.B., M.K., L.A.R. e V.H.M.S.; visualization, M.C.W.M., M.N.B., M.K., L.A.R. e V.H.M.S.; supervision, M.N.B.; project administration, M.C.W.M. e M.N.B. All authors read and agreed with the published version of the manuscript.

Data repository

Cadore Weis Maia, Margani (2025). Study replication data: *Fatores associados à satisfação por compaixão e fadiga de compaixão em profissionais de enfermagem*. Figshare. Dataset. https://figshare.com/articles/dataset/_/28840394

Use of artificial intelligence tools

The authors declare that no artificial intelligence tools were used in the composition of the manuscript "*Factors associated with compassion satisfaction and compassion fatigue among nursing professionals*".