European Journal of Occupational Health Nursing

EJOHN is the scientific journal of FOHNEU

Federation of Occupational Health Nurses within the European Union

Original Article

Social support, job satisfaction and mental health: multiple moderation analysis in a population-based sample of nurses

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ABSTRACT

Introduction. Job satisfaction is a factor dependent on personal, organizational, and environmental conditions. Among the various tools available to professionals to increase satisfaction, forms of social support could be considered essential. Their influence can have an impact on mental health status, acting as a protective factor between mental health and job dissatisfaction. The aim was to analyze the possible moderating effect of different forms of social support between job satisfaction and different expressions of mental health in hospital nurses.
Methods. A descriptive cross-sectional population-based study was carried out from the 2017 National Health Survey on hospital nurses. Sociodemographic variables, level of job satisfaction, forms of social support, and expressions of mental health were collected. Statistical analysis included the usual descriptive variables and Spearman's Rho correlation. The multivariate analysis consisted of multiple moderation analyses using the SPSS PROCESS 4.0 macro.
Results. 80 workers met the eligibility criteria. Significant correlations were found between job satisfaction and two forms of social support and eight expressions of mental health. Significant moderating variables were receiving visitors (for sleep problems and feeling overwhelmed and stressed) and receiving recognition for doing the job well (for feeling overwhelmed and stressed), the latter being trended.
Conclusions. Receiving visits from friends and family (and possibly receiving recognition for doing the job well), moderates the relationship between job satisfaction and constantly feeling overwhelmed and stressed. Also between job satisfaction and losing a lot of sleep due to worries.

Keywords: Job satisfaction; Mental Health; Nurses; Occupational Health; Social Support.

Article history

Received: Dec 23, 2024

Revised: Feb 12, 2025

Accepted: March 19, 2025

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De-Pedro-Jiménez D, Vallejo-Pino A. Social support, job satisfaction and mental health: multiple moderation analysis in a population-based sample of nurses. *Eur J Occ Health Nurs*. 2025; 4 (1):29-48. DOI:10.70324/ejohn.v4i1.60

Introduction

Job satisfaction, a comparison between actual work and employee expectations, is a multidimensional factor, dependent on personal, organizational, and environmental conditions (1).

Among the various personal and environmental tools that professionals have to increase satisfaction, different forms of affective, personal, and social support could be considered essential (2).

Social support is described as the total sum of external support that an individual can obtain through their social connections. If the influence is positive, it can make the person feel emotionally balanced and develop a sense of professional belonging that improves job satisfaction (3,4).

This positive influence of support will also have repercussions on mental health, acting as a protective factor between it and job dissatisfaction (5,6).

The 2017 National Health Survey (ENSE) collected all the aforementioned variables prior to the COVID-19 pandemic, thus avoiding the influence of an extraordinary factor that has distorted the usual working conditions (7). This will allow, in the next survey, to compare the influence of the pandemic. The survey provides a sufficiently large sample of nursing staff to investigate the possible relationships between job satisfaction, perceived mental health status, and different forms of social support (8).

The adult health status module includes job satisfaction levels in its work conditions section, and mental health based on the General Health Questionnaire (GHQ-12). The Duke-UNC-11 questionnaire assesses social support in two dimensions: confidant, or the ability to rely on others for communication, and affective. Both questionnaires are internationally recognized and validated tools for the Spanish population, which, together with the sampling method, guarantees the quality and representativeness of the data (9).

Similarly, new statistical techniques such as moderation analyses, which attempt to explain under what circumstances an effect exists or not, offer greater guarantees in their conclusions, even allowing for causal inferences, which are always limited in other techniques (10).

The scarcity of studies on job satisfaction (11) together with the aforementioned points encourages us to study the relationship between job satisfaction and forms of social support and mental health, as well as to investigate the possible moderating effect of forms of social support between job satisfaction and different expressions of mental health in hospital nurses.

Methods

Study Design. Population and Sample

This was a population-based cross-sectional study using data from the ENSE, conducted by the Spanish Ministry of Health, Consumer Affairs, and Social Welfare in collaboration with the National Statistics Institute. The survey collected health-related information from 23,860 households and a sample of 29,800 individuals residing in Spain.

A three-stage stratified sampling method was employed, distributing the sample among autonomous communities uniformly and proportionally to their size. Similarly, census sections were selected within each stratum with probability proportional to size. Within each section, dwellings were selected using systematic sampling after ordering by size, resulting in self-weighted samples in each stratum. For the selection of individuals, the Kish grid method was used, assigning equal probability to all household members.

Eligibility Criteria

The sample included individuals who were working full-time in a hospital at the time of the survey, were Spanish citizens, held university degrees, and whose profession was coded according to the 2011 National Classification of Occupations as nursing and midwifery professionals. Conversely, cases that responded "don't know" or "did not answer" for any of the analyzed variables, as well as values that did not belong to any of the items included in the scales, were excluded.

The final sample consisted of 80 nurses. For an estimated population of 210,423 hospital professionals in both public and private sectors in 2017 (the year of the ENSE) (12,13) and an estimated average prevalence of 26% of mental health problems in Spanish nurses pre-pandemic (14), the margin of error was 9.6% (95% confidence interval).

Variables and Measurement

1. Sociodemographic Variables:
    - Age (in years).
    - Sex (Female, Male).
    - Marital status (Single, Married, Widowed, Legally separated, Divorced).
2. Work-related:
    - Job satisfaction level: For moderation analysis, the initial seven categories, ranging from not at all satisfied to extremely satisfied, were dichotomized into -0.5 (not at all to somewhat satisfied) and 0.5 (quite to extremely satisfied), as required by the statistical procedure.
3. Forms of social support (all rated on a scale ranging from much less than desired, less than desired, neither much nor little, almost desired, and as much as desired):

    1. I receive visits from my friends and family.
    2. I receive help with household chores.
    3. I receive praise and recognition for doing a good job.
    4. I have people who care about what happens to me.
    5. I receive love and affection.
    6. I have the opportunity to talk to someone about their work or home problems.
    7. I have the opportunity to talk to someone about their personal and family problems.
    8. I have the opportunity to talk to someone about their financial problems.
    9. I receive invitations to relax and go out with other people.
    10. I receive helpful advice when something important happens in my life.

4. Mental health (questions 1, 3, 4, 7, 8, and 12 were rated on a scale of much more than usual, about the same as usual, less than usual, and much less than usual; questions 2, 5, 6, 9, 10, and 11 were rated on a scale of not at all, no more than usual, somewhat more than usual, and much more than usual):
    1. I have been able to concentrate well on what I was doing.

2. My worries have kept me awake at night.
3. I have felt that I am doing something useful with my life.
4. I have felt able to make decisions.
5. I have felt constantly tense or stressed.
6. I have felt that there is little point in doing things.
7. I have been able to enjoy my normal daily activities.
8. I have been able to cope adequately with problems.
9. I have felt sad or depressed.
10. I have lost confidence in myself.
11. I have felt that I am a worthless person.
12. On the whole, I have been feeling reasonably happy, considering everything.

Ethical and Legal Aspects

The data published by the ENSE guaranteed the confidentiality and anonymity of all participants. The use of ENSE data does not require approval from an ethics committee. Publicly available data files are not considered confidential according to Regulation (EU) 2016/679.

Statistical Analysis

IBM SPSS Statistics 26.0 software (IBM, Chicago, IL, USA) was used for statistical analysis. Quantitative variables were represented by the mean and standard deviation, while qualitative variables were summarized by their absolute frequencies and percentages. Spearman's rho correlation was applied between job satisfaction and the forms of social support and mental health.

For the moderation analysis, the SPSS PROCESS 4.0 macro (15), models 1 and 2, was used with a 95% confidence interval and 10,000 bootstrapping samples. The Johnson-Neyman technique was selected to identify the points at which the relationship between the independent variable and the outcome variable is significant.

Procedure

Once significant and highly significant correlations were identified between job satisfaction and the various forms of social support and expressions of mental health, a simple moderation analysis (model 1) was conducted between job satisfaction (independent variable) and all mental health questions that reached significance in the correlational analysis (dependent variable), considering social support variables as moderators (a total of 16 analyses).

Subsequently, two moderator variables were identified and deemed of particular interest. Therefore, a new analysis (model 2) was conducted including both moderator variables jointly to explore their interactive effects.

Results

Descriptives

Eighty workers met the eligibility criteria. Table 1 presents the sociodemographic and labor characteristics of the sample.

Table 1. Sociodemographic characteristics and job satisfaction (N=80)

Variable	Categories	Mean (SD) or n (%)
Age		44,33 (10,44)
Sex	Men	12 (15%)
	Women	68 (85%)
Marital status	Single	27 (33,8%)
	Married	41 (51,2%)
	Legally separated	4 (5%)
	Divorced	8 (10%)
Job satisfaction	Not at all to somewhat	12 (15%)
	Quite to extreme	68 (85%)

SD = Standar Deviation.
Own elaboration

Table 2 shows the percentages in each response category of the social support questions. It is noteworthy that questions exceeding 60% in the "as much as desired" category contrast with those that did not reach 38%.

Tabla 2. Percentage of responses to the questions on social support by category

Social Support	Visits from friends and family	Help with household chores	Job recognition	Counting on someone	Receiving love and affection	Talking about problems at work or home	Talking about personal and family problems
Much less than desired	0	6,3	7,5	0	0	0	0
Less than desired	8,8	6,3	13,8	2,5	1,3	0	2,5
Neither too much nor too little	25,0	26,3	22,5	1,3	5,0	3,8	2,5
Almost as much as desired	28,8	27,5	25,0	33,8	26,3	26,3	26,3
As much as desired	37,5	33,8	31,3	62,5	67,5	70,0	68,8

Own elaboration.

The radial graph illustrating this differentiation (Figure 1).

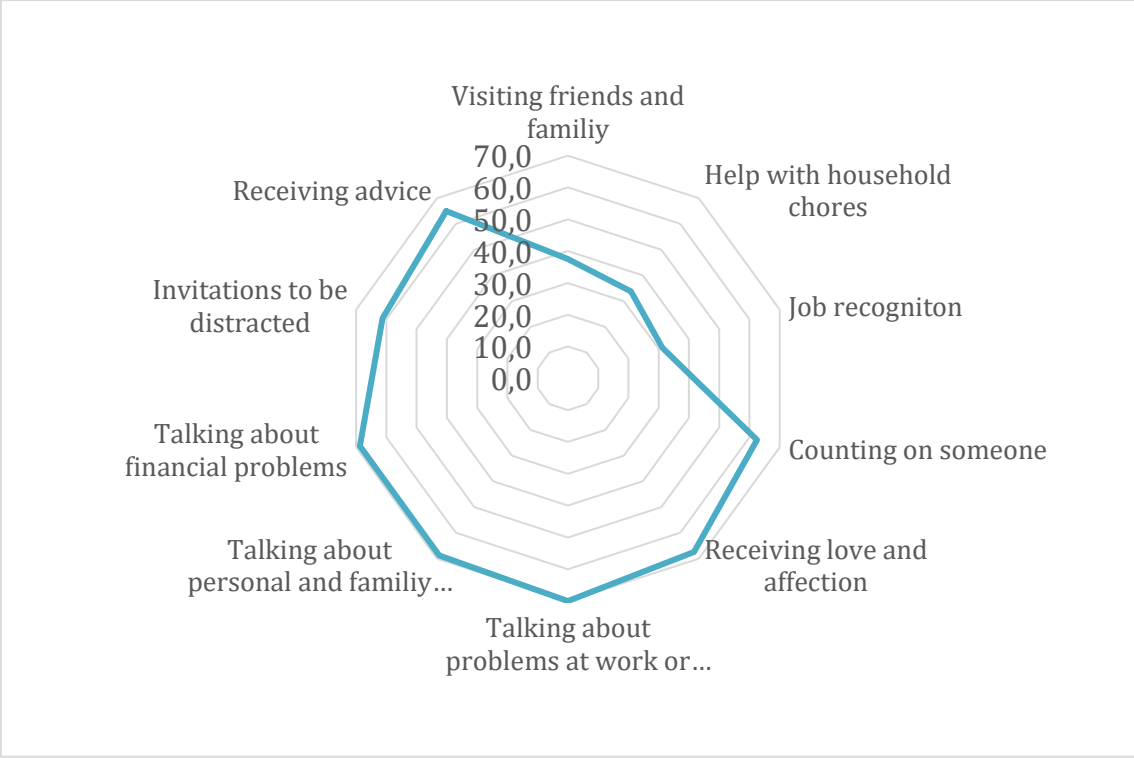

Figure 1. Forms of social support (percentages according to the category "As much as desired").

Tables 3 and 4 present the response percentages for the mental health questions by category. In Table 3, the highest percentages accumulate in the "same as usual" category".

Table 3. Response rates to mental health questions by category (I)

Mental health	You have been able to concentrate well on what you were doing	You have felt that you are playing a useful role in your life	You have felt able to make decisions	You have been able to enjoy your normal activities every day	You have been able to cope adequately with your problems	You feel reasonably happy considering all the circumstances
Better than usual	2,5	7,5	2,5	5,0	3,8	5,0
Same as usual	90,0	90,0	95,0	85,0	95,0	87,5
Less than usual	6,3	1,3	2,5	10,0	1,3	7,5
Much less than usual	1,3	1,3	0	0,0	0,0	0,0

Own elaboration.

In Table 4, the highest percentages accumulate in the categories "Not at all" and "No more than usual".

Table 4. Response rates to mental health questions by category (II)

Mental health	Your worries have caused you to lose a lot of sleep	You have constantly felt overwhelmed and under stress	You have had the feeling that you are unable to overcome	You have felt unhappy or depressed	You have lost self-confidence	You have thought that you are a worthless person
No, not at all	27,5	30,0	42,5	48,8	61,3	80,0
No more than usual	52,5	50,0	47,5	41,3	30,0	18,8
Somewhat more than usual	17,5	18,8	8,8	10,0	8,8	1,3
Much more than usual	2,5	1,3	1,3	0,0	0,0	0,0

Own elaboration.

Inferencial analysis

The correlational analysis, where significant or highly significant values were obtained, can be consulted in Table 5. In terms of mental health, constantly feeling overwhelmed and tense stands out (-0,353, p<0,01).

Table 5. Significant correlations between job satisfaction and forms of social support and mental health

		Job satisfaction
Social support	I receive visits from my friends and family	,220*
	I receive praise and recognition for doing my job well	,286*
Mental health	Your worries have caused you to lose a lot of sleep	-,241*
	You have felt able to make decisions	-,291**
	You have felt constantly overwhelmed and under stress	-,353**
	You have had the feeling that you cannot overcome your difficulties	-,266*
	You have been able to enjoy your normal daily activities	-,233*
	You have felt unhappy or depressed	-,302**
	You have lost self-confidence	-,311**
	You feel reasonably happy considering all the circumstances	-,257*

**: Correlation is significant at the 0.01 level (bilateral).

*: Correlation is significant at the 0.05 level (bilateral).

Own elaboration.

The simple moderation analysis, conducted between the variables that reached significance in the correlational analysis, is shown in Table 6.

Table 6. Results of simple moderation analyses (independent variable job satisfaction)

		Social support (moderating variables)					
		I receive visits from my friends and family			I receive praise and recognition when I do my job well		
		Regression coefficients, p-value					
		b1	b2	b3	b1	b2	b3
Mental Health (outcome variables)	Your worries have caused you to lose a lot of sleep	**-1.010, p=0.019**	**-0.328, p=0.002**	**0.232, p=0.031**	-0.236, p=0.471	-0.093, p=0.299	0.352, p=0.696
	You have felt able to make decisions	-0.267, p=0.035	-0.077, p=0.015	0.044, p=0.154	0.022, p=0.814	0.028, p=0.269	-0.035, p=0.171
	You have felt constantly overwhelmed and under stress	**-1.275, p=0.001**	**-0.340, p=0.0009**	**0.256, p=0.011**	**-0.822, p=0.007**	**-0.211, p=0.012**	**0.159, p=0.056***
	You have had the feeling that you cannot overcome your difficulties	-0.85, p=0.024	-0.336, p=0.004	0.151, p=0.100	-0.434, p=0.139	-0.035, p=0.661	0.045, p=0.573
	You have been able to enjoy your normal daily activities	-0.565, p=0.007	-0.139, p=0.008	0.922, p=0.076	-0.343, p=0.03	-0.042, p=0.332	0.038, p=0.373
	You have felt unhappy or depressed	-0.708, p=0.058	-0.238, p=0.011	0.114, p=0.217	-0.275, p=0.309	-0.155, p=0.04	0.006, p=0.934
	You have lost self-confidence	-0.776, p=0.03	-0.313, p=0.0006	0.138, p=0.12	-0.175, p=0.528	-0.054, p=0.478	-0.022, p=0.773
	You feel reasonably happy considering all the circumstances	-0.380, p=0.051	-0.188, p=0.0002	0.079, p=0.102	-0.056, p=0.717	0.008, p=0.851	-0.008, p=0.851

Analyses where significant relationships were obtained for each coefficient are indicated in bold.
* Trend significance. Own elaboration.

Figure 2 shows the conceptual and statistical diagram of the model used. In "I have constantly felt overwhelmed and stressed," the moderating effect of "I receive praise and recognition for doing a good job" stands out, although this shows a trend toward significance in the interaction between the independent and moderator variables (p=0.056), as well as for

"I receive visits from friends and family". In "My worries have caused me to lose a lot of sleep," the moderating effect that reaches significance is "I receive visits from friends and family".

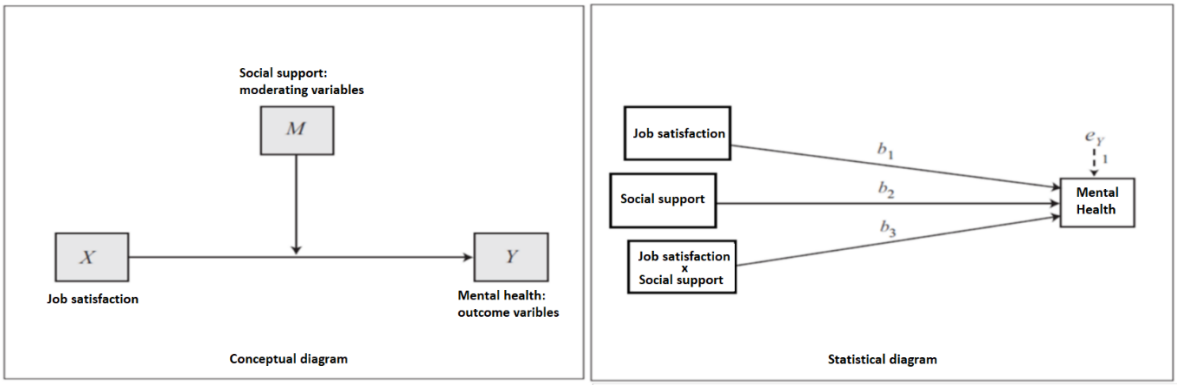

Figure 2. Conceptual and statistical diagram of model 1.

The Johnson-Neyman technique established a significant conditional effect of the moderator variable "I receive visits from my friends and family" on the outcome variable "My worries have caused me to lose a lot of sleep" up to a value of 3.25 (effect -0.255, p=0.05). Regarding the outcome variable "I have constantly felt overwhelmed and stressed," this effect is significant up to a value of 4.1 (effect -0.214, p=0.05) (Figure 3).

The effect of the moderator variable "I receive praise and recognition for doing a good job" on the outcome variable "I have constantly felt overwhelmed and stressed" established a significant conditional effect up to a value of 3.7 (effect -0.222, p=0.05) (Figure 4, supplementary material).

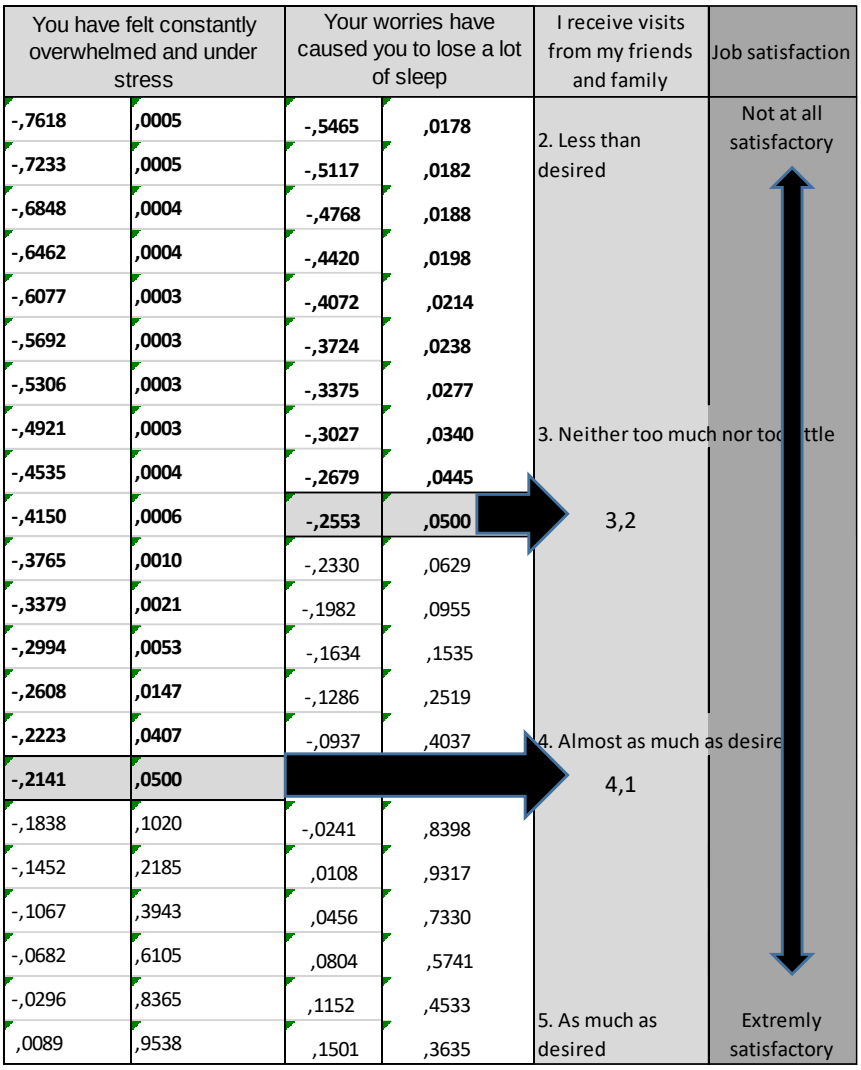

Figure 3. Conditional effect of the moderator variable "I receive visits from my friends and family" on the variables "your worries have made you lose a lot of sleep" and "you have constantly felt overwhelmed and under stress" (category 1, much less than desired, is not represented because its frequency was zero).

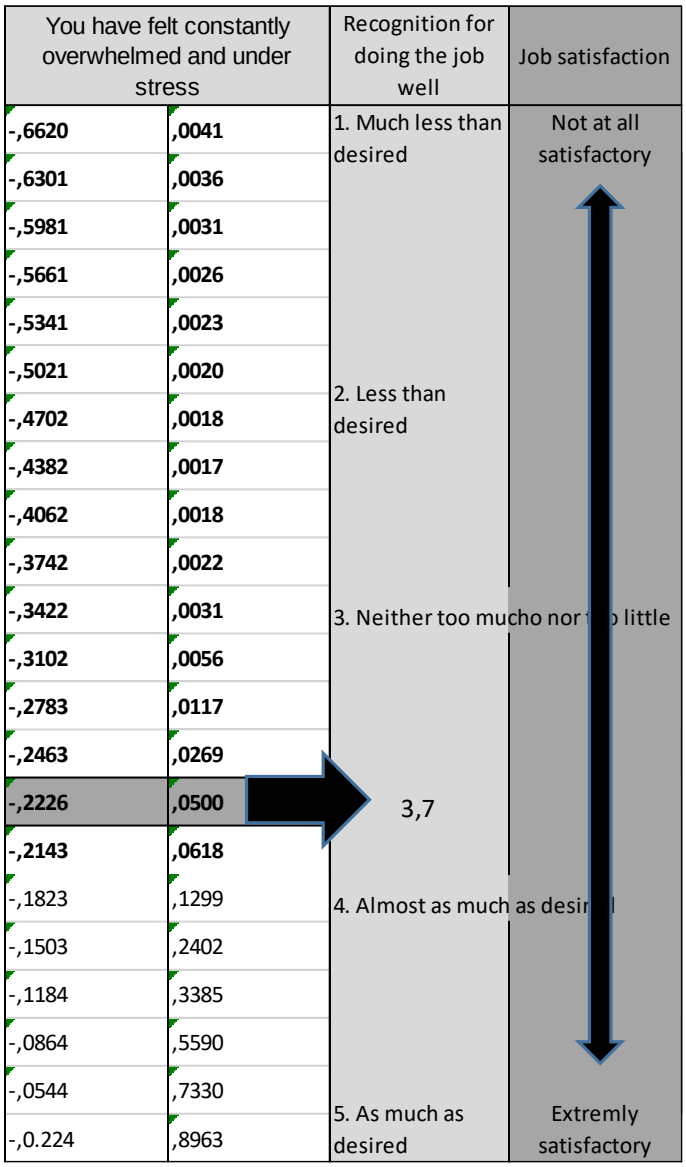

Figure 4. Conditional effect of the moderator variable "I receive praise and recognition for doing the job well" on the outcome variable "you have constantly felt overwhelmed and under stress".

Discussion

We aimed to study the relationship between job satisfaction, forms of social support, and mental health, as well as the potential moderating effect of forms of social support between job satisfaction and different expressions of mental health in hospital nurses.

We found relationships between job satisfaction, two forms of social support, and eight expressions of mental health (Table 5). Receiving visits from friends and family and

receiving praise and recognition for doing a good job (the latter in a trend toward significance), could be moderating the relationship between job satisfaction and feeling overwhelmed and tense. It also moderates the relationship between job satisfaction and losing a lot of sleep due to worries.

The response categories "almost desired" and "as much as desired" are those that encompass the highest percentages of responses regarding forms of support, but it is observable that there are three that differ from the rest (Figure 1), visits from friends and family, help with the house, and job recognition. The rest of the forms of support could be covered by the partner: receiving advice, distraction, talking about economic, personal, and family problems, and having someone's love and affection. However, receiving visits from friends and family, receiving help with the house, and job recognition are forms of support that are either not related to the partner or, as in the case of help with the house, are negatively related, highlighting gender differences in terms of domestic chores.

Regarding responses about mental health, the questions about concentration, usefulness in life, ability to make decisions, to enjoy, to cope with problems, and to be reasonably happy considering all circumstances concentrated the highest percentages of responses in the category "the same as usual" (Table 3), which gives us assurance that there have been no significant changes in the situation of the respondents in recent weeks. The rest of the expressions of mental health, losing sleep, feeling overwhelmed, having a feeling of not being able to overcome difficulties, feeling unhappy or depressed, losing self-confidence, and thinking that one is worthless, concentrated the highest percentages of responses in the categories "No, not at all" and "No more than usual" (Table 4), which could indicate that the study sample enjoys relatively good mental health (highlighting the 80% of responses of "No, not at all" to thinking that one is a person who is worthless).

The correlational analysis found a relationship between job satisfaction and two forms of social support: receiving praise and recognition for doing a good job and receiving visits from friends and family, and eight expressions of mental health: losing sleep, feeling capable of making decisions, feeling overwhelmed and tense, having the feeling of not being able to overcome difficulties, being able to enjoy normal activities, feeling unhappy or depressed, losing self-confidence, and feeling reasonably happy despite everything. The positive sign of

the forms of social support implies a direct relationship, that is, high levels of satisfaction correspond to high levels of support. The relationship is inverse in the relationship between satisfaction and expressions of mental health, low levels of satisfaction correspond to expressions of mental health that imply feeling more worried, being unable to make decisions, to enjoy or to feel happy, as well as feeling more overwhelmed and tense, being unable to cope with difficulties or losing self-confidence.

These results are consistent with those obtained by other authors such as Orgambídez-Ramos and Borrego-Alés in 2017, who in a study of 215 Portuguese nurses concluded that the support of supervisors and colleagues was significantly related to job satisfaction (16). Subsequently, in 2021, Polat and Terzi, in a study of 655 nurses, highlighted the importance of administrative, organizational, and coworker support for increasing job satisfaction (17). Also in 2021, Ruiz-Fernández et al., pointed out the importance of social support associated with burnout, as an expression of mental health status, as well as with emotional well-being. In this case, the study focused on Spanish nurses in emergency services (18).

In the multiple simple moderation analyses performed (16 in total), two reached statistical significance and one showed a trend. Receiving visits from friends and family moderates the relationship between job satisfaction and feeling overwhelmed and tense ($p=0.011$), up to a value of 4.1, and losing sleep due to worries ($p=0.031$), up to a value of 3.2. That is, if as many visits as desired to almost desired are received, the relationship with feeling overwhelmed and tense disappears, and with respect to losing a lot of sleep, if visits are received between as much as desired to almost neither much nor little, the relationship also disappears (Figure 3).

Receiving recognition for doing a good job tends to moderate the relationship between job satisfaction and feeling overwhelmed and tense ($p=0.056$), up to a value of 3.7. That is, there is no relationship with feeling overwhelmed and tense when receiving recognition for doing a good job as much as desired and somewhat above almost desired (Figure 4). The fact that both forms of social support coincided on the expression of mental health "has been constantly feeling overwhelmed and tense" led us to apply the second moderation model, which jointly evaluates the influence of two moderating variables on the

outcome variable. Although the joint interaction of both moderators reached significance (p=0.0178), the presence of multicollinearity in this model forces us to discard this analysis, although a possible joint relationship is glimpsed that should be explored in further studies.
Feeling overwhelmed and tense are manifestations of stress, as well as having sleep problems (19,20). The relationship between low levels of satisfaction and high levels of stress has been demonstrated in several studies (21,22). The bidirectionality of the relationship and the influence of various forms of mediation and moderation only show a complex reality where visits from friends and family have a place in alleviating the tension to which professionals are subjected. The increase in social support through friends and family to prevent mental illness was already demonstrated by Voltmer and Spahn in 2009 through a systematic review (23). Also to reduce the negative effects of stress, as Fu et al., concluded in 2018 by analyzing a sample of 294 nurses (24) or Nie et al., in 2020, on a sample of 352 doctors, focused on suicidal ideation as an effect of stress (25).

The way in which family support increases job well-being was addressed by Chan et al., in 2020 (26). Chan et al., maintain the chain mechanism: family support, development of work-family enrichment, well-being at work, and finally job satisfaction.
In our view, the complexity of human relationships, the multifactorial nature to which they are subjected, including the very idiosyncrasy of individuals, affect the mechanisms that try to explain the relationships between job satisfaction and the different expressions of mental health. It seems evident, after the analyzed studies and with the contribution of ours, focused on Spanish nurses working in hospitals, that the support of family and friends is very important, although it is necessary to continue studying and deepening this problem through longitudinal studies on all aspects of nursing.

Our study presents several limitations. In addition to the lack of causality of cross-sectional studies, it would be necessary to increase the sample size to reduce the margin of error. Not all moderation analyses between the forms of social support and expressions of mental health have been carried out due to the high number of relationships to consider (120), which would extend our analysis excessively. Although this limits our results, it encourages the conduct of complementary studies to continue investigating the relationships mentioned and to be able to compare pre-pandemic and post-pandemic data.

In conclusion, receiving visits from friends and family (and, in a trend, receiving praise and recognition for doing a good job) moderates the relationship between job satisfaction and constantly feeling overwhelmed and tense. Also, between job satisfaction and losing a lot of sleep due to worries. It is necessary to implement actions to foster the different forms of social support that can help increase the level of job satisfaction and reduce potential mental health problems in nurses.

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