



Relationships among general health, job satisfaction, work engagement and job features in nurses working in a public hospital: A cross-sectional study

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Review

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3 **Relationships among general health, job satisfaction, work**
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5 **engagement and job features in nurses working in a public**
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7 **hospital: A cross-sectional study**
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12 **ABSTRACT**
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15 **Aim and objective:** To describe relations among health, job satisfaction, work
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17 engagement and job features in Spanish nurses working in a public hospital.
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20 **Background:** It has been established that the health of the nursing staff affects the quality
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22 of their work and is associated with job satisfaction, work engagement and different job
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24 features. Understanding the relationships among these variables could provide useful
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26 information to improve staff performance and to prevent work-related illnesses.
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29 **Design:** A descriptive, cross-sectional, correlational and comparative study was performed
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31 between January and April of 2016. This research adheres to the Strengthening the Reporting
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33 of Observational Studies in Epidemiology (STROBE) guideline
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36 **Methods:** A total of 926 nurses were requested to complete an on-line questionnaire.
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38 Nurses on sick leave or in period of unpaid leave during data collection were excluded. The
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40 final study population reached 392 nurses. The on-line survey was fully completed by a
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42 subgroup of 373 nurses. General health, job satisfaction and work engagement were
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44 measured. Tools used were: sociodemographic questions, General Health Questionnaire,
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46 Overall Job Satisfaction Scale and Utrecht Work Engagement Scale.
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49 **Results:** Significant correlations among general health, job satisfaction and work
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51 engagement were found. Specifically, general health levels were negatively correlated with
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53 job satisfaction and work engagement subscales. Job features with influence over these
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55 constructs were type of shift, contract, service, salary, continuous formation and having a
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57 speciality or profile.
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3 **Conclusions:** Our results support the notion that job-related features affect job satisfaction,
4 general health and work engagement. The organization should make interventions over these
5 features in order to increase job satisfaction and work engagement levels, since they have
6 special importance for nursing staff health and patient security.
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10 **Relevance to clinical practice:** The analysis of these relationships could offer a basis to
11 design preventive programs to improve staff performance and to prevent work-related
12 illnesses.
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20 **Key words:** health status, job features, job satisfaction, nursing, work engagement.
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28 29 **What does this paper contribute to the wider global clinical community?**

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- In the present research, the relationships among general health, job satisfaction, work engagement and different job features were studied on a large population of 392 nurses of a public Spanish hospital.
 - This study demonstrates that health status is negatively correlated with levels of satisfaction and engagement, while intrinsic satisfaction shows strong relationships with engagement subscales. This study also shows that job features show influence over engagement, job satisfaction and health. Besides, training and having a speciality/profile show influence over engagement and health respectively.
 - Our results are relevant to prevent work-related illnesses in nurses and to design preventive programs for the nursing staff. Since job satisfaction and work engagement also influence the quality of cares, our results should be taken into account in the design of programs to improve the quality of nursing performance and patient security.

Introduction



It has been established that concepts like Work Engagement (WE), wellbeing at work or Job Satisfaction (JS) have impact on health status in nurses (Jenaro, Flores, Orgaz, & Cruz, 2011; Schaufeli & Bakker, 2004; Vander Elst et al., 2016). In addition, the levels of JS and WE are related to the quality of nursing performance (Van Bogaert, Wouters, Willems, Mondelaers, & Clarke, 2013; Warshawsky, Havens, & Knafl, 2012). On the other hand, WE is related to motivation in worker (Schaufeli & Bakker, 2004), which has been analysed in previous studies as a factor with influence over nurses turnover intention (Fernet, Trépanier, Demers, & Austin, 2017). Additionally, JS is also negatively related to turnover intention and WE (Simpson, 2009). It has been demonstrated that dissatisfaction with the organization could even result in negligence (Rusbult & Lowery, 1985). Engaged workers generally have an energetic and effective connection with their work and often report more innovation as well as less errors, accidents or injuries (Wang & Liu, 2015). Factors related to the organization or the work environment also influence WE levels (Peter Van Bogaert, Clarke, Willems, & Mondelaers, 2013; Vander Elst et al., 2016; Wang & Liu, 2015). In fact, a recent study analysed the relationship between manager communication behaviour, work engagement and psychological distress in nurses (Kunie, Kawakami, Shimazu, Yonekura, & Miyamoto, 2017). A positive association between motivating language and work engagement among hospital nurses was found (Kunie et al., 2017).

The analysis of the factors that influence WE, JS and health status in nurses is necessary to design interventions that improve the levels of these constructs within organisations and, consequently, enhance the quality of cares administered to patients. In this study we analysed general health, WE and JS in the nursing population of a public Spanish hospital using an on-line questionnaire with high reliability and easy to complete. We analysed the relationships

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3 between these constructs and the influence of several job-related features over WE, JS and the
4 health of the nursing population. Our results could be relevant for organizations in order to
5 prevent illnesses in nurses and increase patient security.
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10 11 **Background**

12 13 *Health status in nurses*

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17 Several studies confirm that nurses health could be affected by their own work. A typical
18 example is the Burnout Syndrome (BS), which can result in a deterioration of the quality of
19 life and service provision (Weinberg & Creed, 2000). Health problems in the nursing staff
20 may be also caused by occupational stress (Adriaenssens, De Gucht, Van Der Doef, & Maes,
21 2011). Additionally, the influence of health status over work performance has been
22 established. Increased psychological distress is linked to low levels of JS, low involvement in
23 decision-making, lack of control, increased pressure, heavy workload, inadequate resources,
24 insufficient training or poor management styles. Therefore, these variables could influence the
25 quality of cares (Weinberg & Creed, 2000).
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38 39 *Work engagement, job satisfaction and influence over staff health*

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41 The correlation between WE, health levels, nursing performance and quality of cares has
42 been demonstrated in previous studies (Freeney & Fellenz, 2013; Sullivan Havens,
43 Warshawsky, & Vasey, 2013). The relationship between WE and emotional intelligence has
44 been also analysed (Liébana Presa et al., 2012; Zhu, Liu, Guo, Zhao, & Lou, 2015). It has
45 been demonstrated that measures of BS and WE could be predictive of mental illness-related
46 long-term absences (Roelen et al., 2015). The relationship between WE and health in Spanish
47 nurses has been explored in previous studies, where low levels of stress and social
48 dysfunction were proved to be predictors of vigour and dedication constructs of WE (Jenaro
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3 et al., 2011). Other authors also found that high levels of WE were related to low levels of
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5 depression, distress and psychosomatic complaints (Schaufeli & Bakker, 2004).
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7 JS should be studied along with WE, since both concepts are related to personnel
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9 motivation (Schaufeli & Bakker, 2004). According to previous research, job dissatisfaction
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11 could trigger serious illnesses (Faragher, Cass, & Cooper, 2005). Besides, job features such as
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13 shift work negatively influence health and JS (Korompeli et al., 2014). Correlations among
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15 the quality of cares, JS and factors like the perception of staffing adequacy have also been
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17 analysed (Kalisch & Lee, 2014). Finally, WE and JS were used in previous studies to
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19 investigate the organizational characteristics that affect occupational stress (Adriaenssens, De
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21 Gucht, & Maes, 2015; Fiabane, Giorgi, Sguazzin, & Argentero, 2013).
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24 The aim of the present study was to assess the relationships among JS, health and WE in
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26 Spanish nurses through a descriptive analysis. For this task, we analysed the complete
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28 population of nurses in a public Spanish hospital. The levels of JS, WE and health status were
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30 measured. Additionally, sociodemographic data and job features were collected. A
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32 correlational analysis was performed in order to study the relationships among these
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34 constructs. Besides, a comparative analysis was performed to determine the influence of
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36 sociodemographic data and job features over health, JS and WE.
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40 **Methods**

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43 This research adheres to the Strengthening the Reporting of Observational Studies in
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45 Epidemiology (STROBE) guideline (Vandenbroucke et al., 2007).
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48 *Design*

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51 A descriptive, cross-sectional, correlational and comparative study using on-line
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53 questionnaires was carried out.
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Participants and sample



The study was performed in a public hospital of the northwest of Spain. 926 cover letters with the link to the survey were delivered to all the nurses of the hospital. The inclusion criteria were all the active nurses during data collection. Exclusion criteria were nurses on sick leave or in period of unpaid leave during data collection. Finally, 392 nurses participated in the study.

Data collection

Data were collected from January to April 2016. The online survey was developed using the LimeSurvey GmbH tool. It was composed of questions regarding sociodemographic data, job features and three validated questionnaires to measure general health, JS and WE, respectively.

Measures



Sociodemographic data and job features

The first group of questions in the survey were related to sociodemographic data and job features. Demographics included age, gender, work experience and type of continuous training. Job features included salary, type of contract, type of shift, speciality or profile in any nursing field and type of service.

General health

Health status was measured through the General Health Questionnaire (GHQ) (Goldberg & Hillier, 1979). GHQ is a self-administered questionnaire (Molina et al., 2006). The 28-item version of GHQ (GHQ-28) was validated for the Spanish population and only 3-5 minutes were required to complete the questionnaire (Lobo, Pérez-Echeverría, & Artal, 1986). This tool is composed by 28 items in 4 subscales (A, B, C, D), referred to somatic symptoms (A),

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3 anxiety-insomnia (B), social dysfunction (C) and severe depression (D). The Likert method
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5 was applied to analyse the results of this questionnaire, assigning the values 0, 1, 2 and 3 to
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7 each possible answer. With this method, the score in GHQ-28 ranged from 0 to 84 points
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9 (Sterling, 2011). Some authors suggest that a cut-off score of 23-24 points is the threshold for
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11 the presence of distress (Sterling, 2011; Swallow, Lindow, Masson, & Hay, 2003).

12 13 14 *Job satisfaction*

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17 Job conditions were analysed using the Herzberg's Two Factors Theory. For this task, the
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19 Overall Job Satisfaction Scale developed by Warr, Cook and Wall (1979), validated for the
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21 Spanish population and published as a health and safety note (NTP 394) was used (Pérez &
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23 Fidalgo, 1993). This tool contains 15 items in 2 subscales, referred to intrinsic and extrinsic
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25 factors. Answers follow a 7-point Likert scale, ranging from "very unsatisfied" (1 point) to
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27 "very satisfied" (7 points). Three different scores can be obtained. The first one refers to
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29 general satisfaction (GS) and ranges from 15 to 105 points. The second refers to intrinsic
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31 satisfaction (IS) and is in the range 7-49 points. The last score refers to extrinsic satisfaction
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33 (ES) and ranges from 8 to 56 points (Pérez & Fidalgo, 1993). A higher score is related to
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35 higher JS (Pérez & Fidalgo, 1993)

36 37 38 39 *Work engagement*

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42 WE was measured using the Utrecht Work Engagement Scale (UWES-17) validated for
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44 the Spanish population (Schaufeli & Bakker, 2004). This 17-item scale included the three
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46 components of engagement (vigour, dedication and absorption). Each question had a Likert-
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48 scale response, ranging from "never" (0 points) to "every day" (6 points). A higher score in
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50 UWES-17 represents a higher WE (Schaufeli & Bakker, 2004).
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Ethical considerations

The investigation was approved by the hospital Research Committee. A cover letter remarking the voluntary and confidential nature of the study was delivered to all active nurses. Researchers contact details were also provided.

Data analysis

Data were analysed using the IBM[®] SPSS[®] V.23 software. Instrumental reliability was measured using the Crombach's alpha model (Table 1). A descriptive analysis was performed using central tendency, dispersion and frequency measures. The Kolmogorov-Smirnov test with Lilliefors significance correction showed that our variables were not normally distributed. Therefore, we used Spearman's rho test to analyse the correlations between them. Additionally, since our data did not meet parametric test assumptions, the non-parametric Mann-Whitney U and Kruskal-Wallis tests were used to analyse the relationships among variables. *p*-values below 0.05 were considered statistically significant.

Results

Demographics and job features

The final study sample comprised 392 nurses, who fully completed 373 surveys. The age ranged between 22 and 64 years (mean, $M = 44.06$ years, standard deviation, $SD = 11.12$ years). Women represented 88.5 % of the sample. Concerning the type of continuous training in the last year, 42.5 % received clinical training, 4.9 %, received methodological training and 33.2% received both clinical a methodological training. The rest of the sample (19.1%) did not receive these types of training.

INSERT TABLE 1 AROUND HERE

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3 We also analysed various job features, which are included in Table 1 and Table 2. The
4 work experience ranged from 0 to 42 years (M= 20.29 years, SD= 11.26 years). Regarding the
5 type of contract, 55% of the nurses were permanently employed. Finally, 37.2% of our sample
6 had an official specialisation or profile, but only 58.2% of them held a position related to their
7 area of specialisation.
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13 Seven different types of services were identified. 51.0% of our study population belonged
14 to medical services, 22.8% to surgical services and 7.0% to general clinical services. The
15 remaining 19.2% worked in other services in smaller percentages. Regarding the type of shift,
16 eight different modalities were detected. 31.7% of nurses worked regular shifts: morning
17 (27.1%), evening (0.5%) or night (4.1%). Three rotating shifts were also identified: a regular
18 shift with one night (two mornings, two evenings and one night), a regular shift with two
19 nights (two mornings, two evenings and two nights), and an old rotating shift lasting two
20 weeks (seven mornings and seven evenings). The percentages of nurses working on those
21 rotating shifts were 25.8%, 24.5% and 2.8%, respectively. An irregular shift (mornings,
22 evenings and nights with no specific order), associated with 8.0% of nurses, was also
23 identified. Finally, the most common salary range (60.3% of the nurses) was from 1500 to
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48 The questionnaires GHQ-28, NTP 394 and UWES-17 were used to study general health,
49 JS and WE, respectively. A descriptive analysis of the results obtained in these questionnaires
50 is shown in Table 1. The results in GHQ-28 reached the following average scores: subscale A
51 score of 6.52 (SD = 4.15), subscale B score of 6.48 (SD=4.52), subscale C score of 7.34
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(SD=2.65) and subscale D score of 1.39 (SD= 2.87). The average global punctuation for GHQ-28 in our database was 21.73 (SD=11.88). Concerning JS, the average score for the different subscales were 57.95 (SD=19.31) for GS, 27.2 (SD=9.75) for IS and 30.75 (SD=10.12) for ES. For the WE questionnaire, we obtained an average score of 4.68 (SD=1.07) in the vigour subscale, of 4.61 (SD=1.37) in the dedication subscale and of 4.34 (SD=1.24) in the absorption subscale.

Correlational analysis

The Spearman rho test was used to analyse correlations among age, years of experience as a nurse and the subscales of GHQ-28, NTP 394 and UWES-17 (Table 1). Statistically significant correlations ($p<0.05$ and $p<0.01$) have been highlighted in this table. Some results should be underlined. Firstly, a negative correlation was found between work experience and dedication ($\rho=-0.128$, $p=0.013$). Significant negative correlations ($p<0.01$) were also found between GHQ-28 subscales and subscales corresponding to NPT 394 and UWES-17. It should also be noted that significant positive correlations ($p<0.01$) were found among NTP 394 and UWES-17 subscales.

Comparative analysis

A comparative analysis was performed to study the relationships among variables. The Mann-Whitney U and Kruskal-Wallis tests were used and a significance level of $p=0.05$ was considered. Statistically significant results are shown in Tables 3-5.

Health-related variables (GHQ-28 subscales), were significantly associated with having a nursing speciality/profile. Statistically significant interactions were found with subscales A ($Z=-2.37$; $p=0.018$), C ($Z=-1.77$; $p=0.011$) and D ($Z=-2.03$; $p=0.042$) of GHQ-28. Specifically, nurses with a speciality/profile, reached a higher average score in A ($M=7.15$; $SD=4.02$), C ($M=7.77$; $SD=2.53$) and D ($M=1.75$; $SD=2.76$) subscales (Table 3).

We also found significant interactions between the type of shift and subscale B ($\chi^2=16.64$; $p=0.020$) of GHQ-28. As shown in Table 3, nurses with an irregular shift reached the highest score in the anxiety-insomnia criterion (M=7.65; SD=5.77), followed by nurses working in the two-week rotating shift (M=7.64; SD=3.75) and in the one-night rotating shift (M=7.23; SD=4.37). Conversely, the lowest score in this subscale was obtained for the night shift (M=3.19; SD=3.21), followed by the two-night rotating shift (M= 5.86; SD=4.38).

INSERT TABLE 3 AROUND HERE

Variables related to JS were also analysed. We found statistically significant interactions between GS ($\chi^2=15.50$; $p=0.03$) and ES ($\chi^2=17.01$; $p=0.017$) subscales of NTP 394 and the type of contract. As shown in Table 4, Internal Nursing Residents (INRs) reached the highest scores in GS (M=74; SD=17.36) and ES (M=40.83; SD=7.68). However, only six INRs completed the survey (1.5 % of the sample). Nurses with part-time contracts also reached high scores in NTP 394. It should be noted that there were differences between those nurses who had voluntarily chosen a part-time job and those who had not. In the first case ($N=14$), the average score was 73.07 (SD=13.88) for GS and 37.86 (SD=7.60) for ES. When nurses worked on a part-time shift imposed by the institution ($N=9$), the average scores were lower for GS (M=63.89; SD=16.15) and ES (M=34.11; SD=9.37). The lowest average scores for GS and ES were obtained for nurses with a short-term temporary contract (M=55.25; SD=22.62 for GS and M=28.85; SD=11.92 for ES).

The relationship of the type of service with the subscales of NTP 394 was also analysed (Table 4). Statistically significant interactions were found in the three subscales of NTP 394: GS ($\chi^2=16.96$; $p=0.009$), IS ($\chi^2=18.22$; $p=0.006$) and ES ($\chi^2=14.94$; $p=0.021$). The highest scores in GS were obtained by INRs (M=80.40; SD=8.32) and general-resource managers (M=69; SD=18.38). Conversely, the lowest scores in GS were obtained by nurses working in mixed (M=55.75; SD=19.40) and surgical (M=56.85; SD=16.68) services. This tendency was

maintained with IS and ES. INRs reached the highest scores in IS (M=36.60; SD=6.07) and ES (M=43.80; SD=2.77), followed by general-resource managers (M=33; SD=5.66 for IS and M=36; SD=12.73 for ES). The lowest punctuations in these subscales were also obtained for nurses working in mixed (M=25.58; SD=9.26 for IS and M=30.18; SD=10.21 for ES) and surgical (M=26.06; SD=8.53 for IS and M=30.79; SD=8.84 for ES) services.

We also found that salary was significantly related to GS ($\chi^2=10.05$; $p=0.018$) and ES ($\chi^2=12.85$; $p=0.005$). As shown in Table 4, GS was higher in nurses with lower salary (M=64.63; SD=17.19), followed by nurses earning 2000-2500 € per month (M=59.2; SD=16.77). It should be noted that nurses with the highest salaries reached the lowest scores in GS (M=52.50; SD=3.54). The same tendency was found for the relationship between salary and ES (Table 4).

INSERT TABLE 4 AROUND HERE

Statistically significant results regarding WE were found too. First, the type of contract seems to have influence over the three dimensions of WE (see Table 5): vigour ($\chi^2=16.87$; $p=0.018$), dedication ($\chi^2=21.77$; $p=0.003$) and absorption ($\chi^2=20.33$; $p=0.005$). In this case, the highest scores in the vigour and dedication subscales of UWES-17 were obtained by nurses with part-time contracts imposed by the institution (M=5.31; SD=0.77 and M=5.54; SD=0.57, respectively) and with temporary contracts (M=5.07; SD=0.71 and M=5.23; SD=0.75, respectively). Nurses with these contracts also reached high scores in the absorption subscale, but they were lower than in the case of INRs (M=4.89; SD=0.79). Moreover, the vigour and absorption scores were the lowest of the sample for nurses with voluntarily chosen part-time contracts (M=3.94; SD=1.18 and M=4.77; SD=0.87, respectively). However, the lowest scores in the dedication subscale were obtained for the permanent (M=3.73; SD=1.58) and long-term temporary (M=3.94; SD=2.00) secondment contracts.

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3 Statistically significant interactions were also found between the type of service and vigour
4 ($\chi^2=14.10$; $p=0.029$) or absorption ($\chi^2=16.86$; $p=0.01$) (Table 5). General-resource managers
5 obtained the highest scores in vigour and absorption ($M=5.50$; $SD=0.71$). We also found
6 statistically significant interactions between the type of shift and absorption ($\chi^2=15.75$;
7 $p=0.027$), as shown in Table 5. Nurses with irregular shifts obtained the highest scores
8 ($M=4.73$; $SD=0.81$). The lowest scores were obtained for nurses working on the night shift
9 ($M=3.26$; $SD=1.68$).

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18 Finally, the kind of continuous training seems to have influence over vigour ($\chi^2=7.91$;
19 $p=0.048$) and dedication ($\chi^2=8.20$; $p=0.042$). Nurses who received methodological training
20 obtained the highest scores in vigour ($M=4.86$; $SD=1.54$) and nurses who received clinical
21 training obtained the highest scores in dedication ($M=4.79$; $SD=1.16$) (Table 5).

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33 Discussion

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36 We analysed the relationships among demographic data, job features, general health, JS
37 and WE of nurses from a Spanish public hospital. In order to measure these constructs, we
38 carried out an on-line survey. Our results show that certain job features are directly related to
39 JS, WE and health in nurses.
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45 Our study population included 392 nurses, who fully completed 373 surveys. The
46 sociodemographic data in our study are similar to previous studies in terms of age and gender
47 (Jenaro et al., 2011; Sullivan Havens et al., 2013; Van Bogaert et al., 2014). However, it
48 should be noted that the sample size in some of those studies was smaller than in our case.
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54 Health status, JS and WE were measured using three validated questionnaires: GHQ-28,
55 NTP 394 and UWES-17. We obtained an average score of 21.73 points for GHQ-28. This
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3 value in near the cut-off-score of 23-24 points, suggested as a threshold for the presence of
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5 distress in previous studies (Sterling, 2011; Vallejo, Rivera, Esteve-Vives, Rodríguez-Muñoz,
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7 & Icaf, 2014). JS was measured through NTP 394, similarly to previous research (Carrillo-
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9 García, Solano-Ruíz, Martínez-Roche, & Gómez-García, 2013; Herrera-Amaya & Manrique-
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11 Abril, 2008). In our study, the scores in GS (M=57.95; SD=19.31), IS (M=27.20; SD= 9.75)
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13 and ES (M=30.75; SD= 10.12) were lower than in previous studies in Spain. Some authors
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15 obtained M=70.6; SD=14.48 for GS; M=32.17; SD=8.28 for IS and M=38.43; SD=7.04 for
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17 ES (Carrillo-García, Martínez-Roche, Gómez-García, & Meseguer-DePedro, 2015).
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19 Similarly, other authors obtained M=77.1; SD=12.36 for GS; M=35.46; SD=6.6 for IS and
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21 M=41.64; SD=6.5 for ES (Herrera-Amaya & Manrique-Abril, 2008). It should be noted that
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23 the sample size is higher in the present study.
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27 Regarding WE, the average scores in vigour, dedication and absorption in our study
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29 reached M=4.68, SD=1.07; M=4.61, SD=1.37; M=4.34, SD=1.24, respectively. These results
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31 agree with a previous research carried out in a Spanish public hospital with a reduced version
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33 of UWES (Jenaro et al., 2011).
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36 A correlational analysis was also performed in order to assess the relationships among the
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38 constructs of JS and WE. We found a statistically significant positive correlation between the
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40 subscales of UWES-17 and NPT 394. Therefore, a higher JS was associated with a higher
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42 WE. In fact JS has been pointed out as a predictor of WE in nurses (Simpson, 2009). It should
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44 be noted that the strongest correlation appeared between IS and dedication. Other interesting
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46 result was a statistically significant negative correlation between dedication and the years of
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48 experience. This result differs from previous studies (Simpson, 2009). This disagreement
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50 could be explained by sample differences. In Simpson (2009), the sample size was smaller
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52 and was composed only by surgical nurses of different hospitals.
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3 The correlational analysis also revealed remarkable relationships between health constructs
4 of GHQ-28 and the results of NPT-394 and UWES-17. This supports the notion that low
5 levels of JS and WE could elicit health risks in nurses. Previous research also described a
6 relationship between low levels of WE and health problems, specifically, anxiety and
7 depression (Adriaenssens et al., 2011; Innstrand, Langballe, & Falkum, 2012; Jenaro et al.,
8 2011). We also found a high correlation between subscales of WE and these health problems.
9 Indeed, the strongest correlations were found when considering vigour, dedication and
10 absorption along with C subscale of GHQ-28. This finding agrees with the results in Jenaro et
11 al. (2011) in a similar context, although they used GHQ-28 with a binary scoring. Despite this
12 difference, results in both studies indicate that social dysfunction could be a key factor to
13 explain low levels of WE. It should also be noted that absorption was only correlated with the
14 C subscale of GHQ-28, which is associated with the feelings of playing a useful part in things
15 or being capable of making decisions (Goldberg & Hillier, 1979). Other authors also indicate
16 that the level of social dysfunction could be associated with poor JS, BS, sleep disorders and
17 life disruption (West, Ahern, Byrnes, & Kwanten, 2007).
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35 The influence of sociodemographic data and job features over general health, JS and WE
36 was studied through a comparative analysis. We found that having a speciality/profile and the
37 type of shift were significantly related to health. Previous research has been devoted to study
38 the relationship between nursing specialities and BS or stress (Adriaenssens et al., 2011;
39 Browning, Ryan, Thomas, Greenberg, & Rolniak, 2007). In the present study, we only
40 analysed whether nurses had a specialised and institutionally recognised training. Our study
41 population included 37.2% of specialised nurses. Statistically significant relationships with
42 GHQ-28 subscales A, C and D were found for both groups: specialists and non-specialists.
43 However, specialised nurses reached higher scores, particularly in C and A subscales. This
44 result may be related to findings in previous studies, where a low decision authority was
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3 found in emergency nurses (Adriaenssens et al., 2011). Certainly, some items in the social
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5 dysfunction subscale (C) are related to decision-making capabilities. The score in these items
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7 may be high for the nurses in our sample who involuntarily work in wards that do not
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9 correspond to their area of expertise. This fact was specifically addressed in our survey and
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11 we found that 41.8% of nurses with a speciality/profile were in this situation. Our results may
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13 also be linked to the relationship between personality and speciality, covered in a recent
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15 scoping review (Kennedy, Curtis, & Waters, 2014). It has also been suggested that nurses feel
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17 attracted to a certain nursing speciality as a result of their personality (McPhail, 2002). As
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19 previously mentioned, an important percentage of nurses with a speciality/profile in our study
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21 do not work in the corresponding hospital wards, which cause conflict with their personality.
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24 We also found significant interactions between the type of shift and the B subscale of
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26 GHQ-28. Nurses with an irregular shift (8%) obtained the highest average score in anxiety-
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28 insomnia ($M=7.75$; $SD=5.77$), followed by nurses working in the rotating two-week shift
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30 (2.8% of the sample, $M=7.64$; $SD=3.75$). Conversely, nurses working in the night shift (4.1%)
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32 reached the lowest average score ($M=3.19$; $SD=3.21$), followed by nurses in the rotating two-
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34 night shift ($M=5.86$; $SD=4.38$) who represented an important percentage of the sample
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36 (24.5%). A meaningful percentage of our population also worked in the rotating one-night
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38 shift (25.8%), but their scores in anxiety-insomnia were higher ($M=7.23$; $SD=4.37$). These
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40 results suggest that the rotating two-night shift may be beneficial to prevent anxiety and
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42 insomnia, while irregular shifts seem to be a risk factor. Our findings are coherent with
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44 previous research, in which greater cognitive and somatic anxiety, together with a greater
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46 sleep disruption were found in the nursing staff working shifts that alter their family or social
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48 life (Korompeli et al., 2014).
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52 Job features seem to be related to JS too. We found statistically significant interactions
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54 when considering salary, type of contract and type of service together with NTP 394
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3 subscales. Salary was related to ES and GS. Indeed, according Herdbergs theory, ES is
4 explained by hygienic factors like salary (Carrillo-García et al., 2013). The type of contract
5 seems to be related to GS and ES too. Nurses working part-time shifts reached higher scores
6 in JS. A high JS was also found for nurses with long-term temporary contracts, who obtained
7 even higher scores in ES than nurses with permanent positions. The lowest ES score was
8 found for nurses with short-term temporary contracts ($M=28.85$; $SD=11.92$). Previous studies
9 have also detected an important relationship between the type of contract and JS, measured in
10 terms of NTP 394 (Carrillo-García et al., 2015).

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The type of service seems to influence the three subscales of NTP 394. Interestingly, the
lowest scores were obtained for mixed services. This result could be related to the fact that
nurses in these services need to adapt their work and schedule to different medical
specialities.

Finally, the type of shift, contract and service, as well as receiving continuous training
were found to interact with UWES-17 subscales. The type of shift was related to absorption.
Nurses with an irregular shift reached the highest scores in this subscale ($M=4.73$; $SD=0.71$).
This issue could be explained in terms of a greater interaction with different colleagues and
daily tasks variability, which could be challenging for these nurses. On the other hand, nurses
in the night shift reached the lowest scores ($M=3.96$; $SD=1.68$). We also found that the type
of contract was significantly related to UWES-17 subscales. High scores were obtained for
nurses working involuntarily part-time (3.6%) and those with temporary contracts (10.3%).
Regarding part-time jobs, the scores of nurses who voluntarily chose these shifts were the
lowest in vigour ($M=3.94$; $SD=1.18$) and absorption ($M=3.24$; $SD=1.5$). This could be related
to the fact that sometimes nurses request a part-time contract due to personal issues that could
affect their energy and resistance. Nurses with temporary contracts obtained high scores in
absorption ($M=4.78$, $SD=0.77$). This is coherent with the scores of nurses with irregular shifts

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3 in absorption, since this type of shift is usually associated with temporary contracts. It should
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5 also be noted that scores in the dedication subscale agree with the negative correlation found
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7 between dedication and the years of experience. Certainly, nurses with contracts related to
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9 greater seniority (permanent contracts, secondment with permanent or long-term temporary
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11 contracts and interim contracts) obtained lower scores in dedication than nurses with short-
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13 term temporary contracts. Regarding the type of service, we found statistically significant
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15 interactions with vigour and absorption subscales. General-resource managers reached the
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17 highest scores in vigour ($M=5.75$; $SD=0.35$) and absorption ($M=5.50$; $SD=0.67$), while nurses
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19 in surgical services reached the lowest scores in vigour ($M=4.61$; $SD=1.12$) and absorption
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21 ($M=4.12$; $SD=1.48$). Our findings also show that the type of continuous training received in
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23 the last year is related to WE. Nurses who selected a clinical training (42.5 %), obtained the
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25 highest scores in dedication ($M=4.79$; $SD=1.16$). Similarly, nurses who chose a
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27 methodological training, associated with research, evidence-based nursing or the nursing
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29 process, reached the highest scores in vigour ($M=4.86$; $SD=1.54$). To the best of our
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31 knowledge, the relationship among these variables has not been previously analysed in nurses.
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33 The fact that this training is voluntarily chosen, could explain our results. Generally, nurses
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35 who want to improve their skills and are highly committed to their work are those who enrol
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37 in training courses. Besides, this result could also be related to the findings of a recent study,
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39 in which work engagement in nurses was found to be influenced by factors like discovering
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41 the core values of nursing or developing an interest or passion for nursing (Keyko,
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43 Cummings, Yonge, & Wong, 2016). An increased WE due to continuous training could be
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45 related to lower health risks, since these constructs of UWES-17 are negatively correlated
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47 GHQ-28 subscales.
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52 In summary, our results revealed important interactions between job features, general
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54 health, JS and WE. The type of shift and having a speciality or profile were directly related
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3 with health levels (and indirectly related to JS and WE, due to the negative correlation). The
4 type of contract or service directly affected JS and, indirectly, health levels and WE.
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6 Additionally, the type contract, shift and service, as well as receiving continuous training are
7 factors with a direct influence over WE and an indirect influence over JS and health. It should
8
9 be noted that the type of shift, contract and service are directly related to at least two of the
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11 analysed constructs.
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16 Additionally, several job features are associated with health, JS and WE levels. Having a
17 specialty/profile and the type of shift were variables directly related to GHQ-28 subscales
18 (and, indirectly, to JS and WE). Similarly, the type of contract or service were directly related
19 to JS (and, indirectly, to general health and WE). Finally, the type of contract, shift, and
20 service as well as receiving continuous training were variables directly associated with WE
21 (and, indirectly, with general health and JS).
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29 It is relevant for public health services to be aware of the relationships among general
30 health, JS and WE. This knowledge could offer clues to prevent illnesses and to improve staff
31 motivation. Since workers offer a service to the community, their levels of health, JS and WE
32 could have an important impact over patients and general population. Additionally,
33 understanding the influence that job features have over health, JS and WE is paramount to
34 design adequate interventions to increase the level of these constructs.
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42 **Limitations**



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44 The current research has some limitations that merit consideration. **Firstly, a cross-**
45 **sectional design was used. Therefore, it was not possible to find chronological tendencies or**
46 **to establish causal relationships.** It should also be mentioned that the sample size may not be
47 large enough to cover the great variability in Spanish nurses and that our results may not be
48 generalised to other staff members. Future research should include a multicentric analysis in
49 order to validate our results.
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Conclusions

In this study, we obtained information about demographics and job features in a public Spanish hospital. We analysed these variables together with the results of three validated questionnaires (GHQ-28, NTP 394 and UWES-17) in order to assess the health, JS and WE levels in the study population. The results support the evidence about the relationships among health, JS and WE in nurses. High levels of JS and WE could be preventive of health problems. Besides, job features such as having a speciality/profile, the type of shift, contract, or service, as well as the salary or receiving continuous training influence JS, WE and general health.

Relevance to clinical practice

Our results can be regarded as a necessary first stage to design strategies aimed at improving JS, WE and general health in nurses. Strategies focused on intrinsic satisfaction should be taken into account due to the strong relationship with WE subscales, especially with dedication. The constructs studied in the present research have special importance for nurses health and for patient security.

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Table 1 Cronbach’s Alpha (α), mean (M), standard deviation (SD) and correlations among age, work experience and GHQ-28, NTP 394 and UWES-17 subscales.

	α	M	SD	1	2	3	4	5	6	7	8	9	10	11
1 Age		44.06	11.12											
2 Work Experience (years)		20.29	11.26	0.950*										
3 A GHQ-28 Somatic Symptoms	0.87	6.52	4.15	-0.060	-0.068									
4 B GHQ-28 Anxiety-insomnia	0.907	6.48	4.52	-0.023	-0.028	0.718**								
5 C GHQ-28 social dysfunction	0.803	7.34	2.65	-0.040	-0.013	0.520**	0.492**							
6 D GHQ-28 severe depression	0.9	1.39	2.87	-0.031	-0.022	0.452**	0.544**	0.450**						
7 NTP 394 General satisfaction	0.914	57.95	19.31	0.001	-0.027	-0.218**	-0.297**	-0.245**	-0.227**					
8 NTP 394 Intrinsic satisfaction	0.889	27.20	9.75	0.019	-0.016	-0.206**	-0.279**	-0.256**	-0.234**	0.960**				
9 NTP 394 Extrinsic satisfaction	0.793	30.75	10.12	-0.020	-0.040	-0.204**	-0.277**	-0.211**	-0.201**	0.959**	0.847**			
10 Vigour	0.905	4.68	1.07	-0.060	-0.055	-0.273**	-0.248**	-0.337**	-0.224**	0.451**	0.459**	0.409**		
11 Dedication	0.879	4.61	1.37	-0.094	-0.128*	-0.192**	-0.243**	-0.375**	-0.245**	0.508**	0.547**	0.434**	0.793**	
12 Absorption	0.8	4.34	1.24	0.001	-0.010	-0.040	-0.043	-0.184**	-0.046	0.348**	0.370**	0.301**	0.674**	0.711**

** $p < 0.01$; * $p < 0.05$.

Table 2 Number (*N*) and percentage of nurses that complied with the different job features analysed.

Job features (variables)	<i>N</i>	Percentage
Type of contract		
Permanent contract	214	55.0 %
Secondment (permanent contract)	12	3.1 %
Secondment (long-term temporary contract)	16	4.1 %
Interim contract	78	20.1 %
Short-term temporary contract	40	10.3 %
Part-time contract (voluntarily chosen)	9	2.3 %
Part-time contract (involuntarily chosen)	14	3.6 %
INR	6	1.5 %
Specialty/Profile		
Yes	144	37.2 %
No	243	62.8 %
Type of service		
Medical services	197	51.0 %
Surgical services	88	22.8 %
General clinical services	27	7.0 %
Mixed services	40	10.4 %
Management positions	24	6.2 %
INR	5	1.3 %
Others (General-resource managers)	5	1.3 %
Type of shift		
Regular morning shift	105	27.1 %
Regular evening shift	2	0.5 %
Regular night shift	16	4.1 %
Rotating regular one-night shift	100	25.8 %
Rotating regular two-night shift	95	24.5 %
Rotating two-week shift	11	2.8 %
Irregular shift	31	8.0 %
Other special conditions	28	7.2 %
Salary range		
<1500 €/month	63	16.2 %
1500 – 2000 €/month	234	60.3 %
2000 – 2500 €/month	89	22.9 %
>2500 €	2	0.5 %
Continuous training in the last year		
Clinical training	165	42.5 %
Methodological training	19	4.9 %
Clinical and methodological training	129	33.2 %
Other	75	19.3 %

INR, Internal Nursing Resident; Only job features for which statistically significant interactions with GHQ-28, NTP 394 or UWES-17 subscales were found in the comparative analysis have been included.

Table 3 Results of GHQ-28 subscales associated with having a speciality or profile and the type of shift (mean \pm SD).

GHQ-28 subscales		Job features		
A GHQ -28 Somatic symptoms	Specialty/Profile †	Yes		7.50 \pm 4.02
		No		6.29 \pm 4.14
B GHQ-28 Anxiety-Insomnia	Type of shift ‡	Regular morning shift		6.49 \pm 3.94
		Regular evening shift		6.00 \pm 4.24
		Regular night shift		3.19 \pm 3.21
		Rotating regular one-night shift		7.23 \pm 4.37
		Rotating regular two-night shift		5.86 \pm 4.38
		Rotating two-week shift		7.64 \pm 3.75
		Irregular shift		7.65 \pm 5.77
C GHQ-28 Social dysfunction	Specialty/Profile †	Yes		7.77 \pm 2.53
		No		7.24 \pm 2.53
D GHQ-28 Depression	Specialty/Profile †	Yes		1.65 \pm 2.76
		No		1.27 \pm 2.95

Only the subscales where significant interactions according to the Mann-Withey U test † or the Kruskal-Wallis test ‡ were found are shown.

Table 4 Results of NTP 394 Overall Job Satisfaction subscales associated with the type of contract, type of service and salary range (mean \pm SD)

Overall Job Satisfaction	Job features				
NTP 394 General satisfaction	Type of contract	Permanent contract	57.39 \pm 17.94		
		Secondment (permanent contract)	56.33 \pm 20.61		
		Secondment (long-term temporary contract)	59.79 \pm 19.48		
		Interim contract	58.38 \pm 18.06		
		Short-term temporary contract	55.25 \pm 22.62		
		Part-time contract (voluntarily chosen)	63.89 \pm 16.15		
		Part-time contract (involuntarily chosen)	73.07 \pm 13.88		
	Type of Service	INR	74.00 \pm 17.36		
		Medical services	58.67 \pm 17.98		
		Surgical services	56.85 \pm 16.68		
		General clinical services	59.63 \pm 21.87		
		Mixed services	55.75 \pm 19.40		
		Management positions	66.63 \pm 13.33		
Salary range	INR	80.40 \pm 8.32			
	Others (General-resource managers)	69.00 \pm 18.38			
	<1500 €/month	64.63 \pm 17.19			
	1500 – 2000 €/month	56.68 \pm 19.20			
	2000 – 2500 €/month	59.20 \pm 16.77			
NTP 394 Intrinsic satisfaction	Type of Service	>2500 €	52.50 \pm 3.54		
		Medical services	27.80 \pm 9.29		
		Surgical services	26.06 \pm 8.53		
		General clinical services	28.59 \pm 10.87		
		Mixed services	25.58 \pm 9.62		
		Management positions	31.88 \pm 6.50		
		INR	36.60 \pm 6.07		
		Others (General-resource managers)	33.00 \pm 5.66		
		NTP 394 Extrinsic satisfaction	Type of contract	Permanent contract	30.47 \pm 9.36
				Secondment (permanent contract)	30.67 \pm 11.10
Secondment (long-term temporary contract)	31.93 \pm 9.56				
Interim contract	31.04 \pm 9.46				
Short-term temporary contract	28.85 \pm 11.92				
Part-time contract (voluntarily chosen)	34.11 \pm 9.37				
Part-time contract (involuntarily chosen)	37.86 \pm 7.60				
Type of Service	INR		40.83 \pm 7.68		
	Medical services		30.87 \pm 9.36		
	Surgical services		30.79 \pm 8.84		
	General clinical services		31.04 \pm 11.28		
	Mixed services		30.18 \pm 10.21		
	Management positions		34.75 \pm 7.22		
Salary range	INR	43.80 \pm 2.77			
	Others (General-resource managers)	36.00 \pm 12.73			
	<1500 €/month	34.67 \pm 9.32			
	1500 – 2000 €/month	30.06 \pm 9.88			
	2000 – 2500 €/month	31.18 \pm 8.91			
		>2500 €	29.00 \pm 2.83		

Only the subscales where significant interactions according to the Kruskal-Wallis test were found are shown.

Table 5 Results of UWES-17 subscales associated with type of contract, type of service and the type of continuous training in the last year (mean \pm SD).

UWES-17	Job features			
Vigour	Type of contract	Permanent contract	4.65 \pm 1.13	
		Secondment (permanent contract)	4.15 \pm 1.32	
		Secondment (long-term temporary contract)	4.45 \pm 1.41	
		Interim contract	4.71 \pm 0.93	
		Short-term temporary contract	5.07 \pm 0.71	
		Part-time contract (voluntarily chosen)	3.94 \pm 1.18	
		Part-time contract (involuntarily chosen)	5.31 \pm 0.77	
		INR	4.81 \pm 0.81	
		Type of Service	Medical services	4.62 \pm 1.02
			Surgical services	4.61 \pm 1.12
	General clinical services		4.92 \pm 1.16	
	Mixed services		4.64 \pm 1.35	
	Management positions		5.24 \pm 0.61	
	INR		4.83 \pm 0.91	
	Others (General-resource managers)		5.75 \pm 0.35	
	Continuous training in the last year		Clinical training	4.78 \pm 0.95
			Methodological training	4.86 \pm 1.54
			Clinical and methodological training	4.74 \pm 1.02
		Other	4.37 \pm 1.24	
	Dedication	Type of contract	Permanent contract	4.53 \pm 1.42
Secondment (permanent contract)			3.73 \pm 1.58	
Secondment (long-term temporary contract)			3.94 \pm 2.00	
Short-term temporary contract			5.23 \pm 0.75	
Part-time contract (voluntarily chosen)			4.24 \pm 1.17	
Part-time contract (involuntarily chosen)			5.54 \pm 0.57	
INR			4.83 \pm 1.41	
Continuous training in the last year			Clinical training	4.79 \pm 1.16
			Methodological training	4.61 \pm 1.63
			Clinical and methodological training	4.68 \pm 1.37
		Other	4.12 \pm 1.64	
		Absorption	Type of shift	Regular morning shift
Regular evening shift				4.33 \pm 0.71
Regular night shift				3.26 \pm 1.68
Rotating regular one-night shift				4.30 \pm 1.13
Rotating regular two-night shift	4.30 \pm 1.33			
Rotating two-week shift	4.61 \pm 0.96			
Irregular shift	4.73 \pm 0.81			
Other special conditions	4.12 \pm 1.28			
Type of contract	Permanent contract			4.37 \pm 1.29
	Secondment (permanent contract)			3.40 \pm 1.39
	Secondment (long-term temporary contract)	3.95 \pm 1.55		
	Interim contract	4.30 \pm 1.12		
	Short-term temporary contract	4.78 \pm 0.77		
	Part-time contract (voluntarily chosen)	3.24 \pm 1.50		
	Part-time contract (involuntarily chosen)	4.77 \pm 0.87		
	INR	4.89 \pm 0.79		
	Type of service	Medical services	4.34 \pm 1.11	
		Surgical services	4.12 \pm 1.48	
General clinical services		4.12 \pm 1.50		
Mixed services		4.45 \pm 1.23		
Management positions		5.03 \pm 0.79		
INR		5.10 \pm 0.67		
	Others (General-resource managers)	5.50 \pm 0.71		

Only the subscales where significant interactions according to the Kruskal-Wallis test were found are shown.