Jurnal Ners

Volume 20 Issue 2, May 2025, p. 154-163
http://dx.doi.org/10.20473/jn.v20i2.65721

Original Article

Open Access

# Burnout and resilience among moroccan healthcare professionals: a comprehensive multi-hospital study

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Responsible Editor: Rizki Fitryasari

Received: 2 December 2024○ Revised: 16 April 2025 ○ Accepted: 18 May 2025

**ABSTRACT**

**Introduction:** Burnout syndrome is a complex and intriguing entity that includes three components: emotional exhaustion (EE), depersonalization (DP), and personal accomplishment (PA). Arising from continued contact with significant stressors, usually in occupational settings, burnout severely affects the individual and their surroundings. This study examines the relationship between burnout and resilience among physicians and caregivers, aiming to determine whether the type of setting and demographic characteristics, such as gender and hospital hierarchy, have any impact.

**Methods:** This multicenter cross-sectional study recruited 296 healthcare professionals through convenience sampling by self-administered questionnaires evaluating the Maslach Burnout Inventory and Connor-Davidson Resilience Scale. Data were analyzed using statistical methods, including correlation analysis and Multiple Correspondence Analysis (MCA).

**Results:** From 158 valid responses, the mean scores for each scale were: EE at 28.44±12.90, DP at 9.96±6.47, and PA at 29.01±10.48; resilience was 23.78±7.71. All three had positive correlations with resilience. There were no significant differences in resilience or burnout between men and women. However, EE and PA were significantly correlated with male resilience, while all three burnout dimensions were associated with female resilience. Local hospitals reported higher mean scores for resilience and PA, whereas provincial hospitals exhibited elevated EE and DP scores. In regional hospitals, resilience was only associated with PA, whereas in provincial hospitals, it was correlated with both EE and PA.

**Conclusions:** We found a high prevalence of burnout and inadequate resilience among healthcare professionals, underscoring the importance of considering these factors in the development of health policies and the implementation of preventive and remedial strategies.

**Keywords:** burnout syndrome, gender differences, healthcare professionals, hospital hierarchy, resilience

## Introduction

Burnout has been defined as a multidimensional syndrome characterized by the triad of emotional exhaustion (EE) "it refers to feelings of being overextended and depleted of one's emotional and physical resources," depersonalization (DP) "it refers to a negative, callous, or excessively detached response to

various aspects of the job," and reduced personal accomplishment (PA) "it refers to feelings of incompetence and a lack of achievement and productivity at work" (Maslach, Schaufeli and Leiter, 2001). Burnout results from continual exposure to high stressors, with work-related conditions often at the center of the phenomenon; it can have severe effects on both individuals and their environments (Maslach and Leiter, 2016). Burnout is a common phenomenon that can affect anyone who has experienced extremely demanding responsibilities and high-stress surroundings in their profession, but some occupations are the primary entry point because they have those work natures (Chen and Meier, 2021; Fernández-Suárez *et al.*, 2021), including healthcare professionals. Reports suggest burnout can happen in every working population (Maslach and Leiter, 2016; Blackstone *et al.*, 2021). Its prevalence varies across countries, with higher levels reported in high-income nations compared to low- and middle-income nations (Morgantini *et al.*, 2020). Studies have indicated that healthcare professionals experience significant levels of burnout (Ardiansyah *et al.*, 2019; De Hert, 2020; Albazoon *et al.*, 2023). A review of 182 research studies from 45 countries estimated the burnout of healthcare professionals to be between 0% and 80.5% (Rotenstein *et al.*, 2018).

According to earlier research, issues such as a heavy workload, an insufficient number of staff, work shifts, a rigid schedule, role conflict, a lack of autonomy, a lack of management support, an inadequate team dynamic, and job instability all contribute to healthcare professionals' burnout (Taranu *et al.*, 2022; Amiri *et al.*, 2024). Furthermore, poor working conditions, socio-demographic and psychological characteristics, and the COVID-19 pandemic all contribute to high levels of burnout since the COVID-19 pandemic (Hur, Cinar and Suzan, 2022; Yin *et al.*, 2023). Reduced job performance, increased absenteeism, and decreased job satisfaction often accompany burnout in healthcare (De Hert, 2020). Burnout is found to be associated with the risk of mental and physical health issues, including depression, anxiety, and chronic fatigue, which can further impair the delivery of healthcare services (Edú-valsania, Laguía and Moriano, 2022), including patient safety and the quality of care (De Hert, 2020; Wang *et al.*, 2020). Additionally, the high turnover of health workers and persistent recruitment challenges support the burnout prevalent among health workforce staff. This, in turn, significantly impacts the efficacy and effectiveness of the respective healthcare organizations (Bakhamis *et al.*, 2019; WHO, 2016).

Until now, most studies have focused on the factors, symptoms, and outcomes of burnout (De Hert, 2020; Acosta-Ramos *et al.*, 2021). Given this, does burnout affect resilience? (Hao, 2023) The American Psychological Association has defined resilience as entailing "the process of adaptation and the ability to recover from adversity, tragedy, trauma, or stress" (APA, 2002). Resilience is a personal attribute that enables an individual to manage an aversive situation to achieve a reasonable adjustment and development (Sisto *et al.*, 2019). Given their positions among the most demanding and stressful, healthcare workers deal with heavy loads. Effectively managing one's stress and addressing workplace challenges largely depends on resilience (Uccella *et al.*, 2024). During the COVID-19 pandemic, resilience, positive emotions, and psychological well-being helped mitigate distress and exhaustion among healthcare workers (Ruini *et al.*, 2025). Healthcare professionals with high resilience tend to demonstrate better coping skills and strategies when faced with stressors, which can minimize the risk of burnout (Croghan *et al.*, 2021), and justify the importance of well-being programs in healthcare settings. These programs aim to enhance the mental well-being of healthcare professionals by addressing both burnout and resilience. This, in turn, improves the quality of care they give to patients.

This study investigates the relationship between resilience and burnout among healthcare professionals in three hospitals in Morocco's Casablanca-Settat region, based on gender and hospital hierarchy, to highlight possible differences. We hypothesize that there is a significant correlation between burnout and resilience among Moroccan healthcare workers. In terms of hospital hierarchy, the correlation varies by gender and local/provincial levels. More specifically, we anticipate that varying levels of resilience will contribute to reducing burnout levels in men compared to women, as well as in local hospitals. We hypothesize that healthcare professionals at local hospitals may exhibit higher resilience and lower burnout compared to those at provincial hospitals. This suggests that the local hospital environment could foster staff resilience and reduce the likelihood of burnout. Notably, Morocco has not conducted any studies on the correlation between burnout and resilience.

## Materials and Methods

### Study Design

We conducted a multicenter cross-sectional survey using a self-administered questionnaire in French, distributed from April 10 to May 16, 2023. The translated questionnaire was adapted to the Moroccan context, and a pre-test was conducted with 19 individuals to ensure clarity and reliability.

### Study setting

Our study involved three different public hospital sites in the Casablanca-Settat region of Morocco: two local hospitals (Bouskoura and Sidi Moumen hospitals) and one provincial hospital (Hassan II Hospital Center). The provincial hospital differs from the local hospital in

its missions and the diversity of its services. The provincial hospital of Settat has a total of 165 nurses, midwives, and health technicians. It cares for the entire population of the province. The Bouskoura Hospital is affiliated with the Crown Prince Moulay El Hassan Provincial Hospital in Dar Bouazza. To date, 86 nurses and health technicians have been assigned to the hospital, working in various medical departments such as the 'emergency department', the 'maternity ward', the 'imaging and medical biology department,' and the 'operating unit'. Al Mansour Provincial H attached itself to the Sidi Moumen Hospital. Its human resources include 31 nurses and 14 health technicians.

### Participants and sampling

The target population consisted of nurses, midwives, and health technicians from the three hospital sites (chosen by convenience, from the most densely populated area), working in the following medical departments: 'the mother and child department', 'surgery and operating theatre department', 'intensive care' and 'emergency department', 'medicine department', 'medical imaging department' and 'medical biology department'. We included in the study the staff members working in these departments who were present at the time of the study. The paper questionnaire was distributed to all healthcare staff (excluding doctors) at the three sites. Completed questionnaires were returned to the interviewer. Thus, the sample size depended on the number of healthcare professionals who agreed to take part in the study. We obtained 158 valid responses from a total population of 296 healthcare professionals, representing 53.38%. The responses were distributed as follows: 83 responses from the Provincial Hospital of Settat (response rate: 50.30%), 51 from Bouskoura Hospital (response rate: 59.30%), and 24 responses from Sidi Moumen Hospital (response rate: 53.33%).

### Background information

The general data collected on each participant are age, gender (female, male), marital status (single, married, divorced, separated), level of study (bachelor, master, doctorate, other), place of residence (Casablanca, Settat, Bouskoura, other), place of work (provincial hospital of Settat, Bouskoura hospital, Sidi Moumen hospital), specialty (multi-purpose nurse, midwife, nurse anesthetist, radiology technician, laboratory technician), and diagnosed illness(es), if present.

### Survey instrument

To assess and measure burnout in our target population, we used the "Maslach Burnout Inventory" (MBI) questionnaire in this study to evaluate burnout among healthcare workers. This validated questionnaire consists of 22 questions that provide information on three distinct dimensions: EE, DP, and diminished PA (Maslach and Jackson, 1981; Maslach, 1982; Dion and Tessier, 1994). EE is defined as a lack of energy, a feeling of exhaustion of emotional resources, a feeling of frustration, and a loss of drive. It is measured using nine questions (1, 2, 3, 6, 8, 13, 14, 16, 20). A score below 17 indicates a low burnout, above 30 a high burnout, and between 18 and 29 a moderate burnout (Maslach and Jackson, 1981; Maslach, 1982). The internal consistency of the test for this dimension gave a Cronbach's alpha of 0.88. DP refers to the development of impersonal, detached, cynical attitudes towards the people we care for. This dimension is covered by five questions: 5, 10, 11, 15, and 22. A total of less than 5 indicates a low burnout, more than 12 a high burnout, and between 6 and 11 a moderate burnout (Maslach and Jackson, 1981; Maslach, 1982). The internal consistency of the test for this dimension gave a Cronbach's alpha of 0.68. Diminished PA corresponds to a drop in self-esteem, a devaluation of one's work and skills, and the belief that one is incapable of responding effectively to the expectations of those around one. Eight questions assess PA (questions 4, 7, 9, 12, 17, 18, 19, and 21). A total score above 40 indicates a low burnout, below 33 a high burnout, and between 34 and 39 a moderate burnout (Maslach and Jackson, 1981; Maslach, 1982). The measurement of internal consistency for this dimension yielded a Cronbach's alpha of 0.84.

Resilience was assessed using the "Connor-Davidson Resilience Scale" (CD-RISC), a self-administered questionnaire consisting of 25 items that assess several aspects of resilience, including feelings of self-efficacy, tolerance of negative affect, ability to adapt and accept change, and perception of social support received (Connor and Davidson, 2003). Connor and Davidson's valid short-form scale (CD-RISC 10) of 10 items provides a reliable and rapid estimate of resilience. This short version reflects the ability to "bounce back" quickly after a test or an obstacle (Campbell-Sills and Stein, 2007; Hébert *et al.*, 2018). This instrument employs a 5-point Likert-type response scale, ranging from 0 ('Not true at all') to 4 ('True most of the time'). In our survey, the measurement of internal consistency of the test yielded a Cronbach's alpha of 0.86.

### Ethical considerations

The survey approach complied with ethical requirements. The participation was voluntary. Written and signed consent was obtained from each participant. Participants were informed of the purpose, context, and practical information of the study as well as of their right to decide freely whether to take part and to withdraw at any time without prejudice. They were also informed of the researcher's commitment to guarantee the anonymity and confidentiality of the information gathered through the questionnaire. The questionnaire was self-administered, thus avoiding any direct contact between the investigator and the participants. Internet protocol addresses (IP addresses) were suppressed to

ensure the anonymity of responses. Raw data remains confidential. The ethical standards were in line with the Helsinki Declaration of October 2013.

The study aligns with the objectives of the institutional project FP/2020/02, titled "Simulation Pedagogy for Nursing and Midwifery Education and Patient Safety," supported by the University Hassan First of Settat. The research was approved by the university's research committee and granted an ethics review exemption, as it involves no risks to participants."

### Statistical analysis

The data collected is processed and analyzed using SPSS software (version 20.0). Quantitative variables are described using the mean and standard deviation when the normality condition is met, and quartiles are determined when appropriate. Categorical variables were described using frequencies and percentages. The Student's t-test was used to compare mean scores between men and women, as well as between different hospital hierarchies. For categorical variables, the chi-square test was performed, and the effect size was calculated using Cramer's V. This coefficient is interpreted as follows: values close to 0 indicate no association; values between 0 and 0.1 represent a very weak association; values between 0.1 and 0.2 indicate a weak association; values between 0.2 and 0.3 correspond to moderate association; and values above 0.3 indicate a strong association. We examined bivariate correlations among the different scores within the sample, stratified by hospital hierarchy and gender. The significance was set at $p < 0.05$. We used Multiple correspondence analysis (MCA) to explore intercorrelations between categorical variables and their relationships with other selected variables.

## Results

### General characteristics

In the study sample, the average age was 35.82±8.26 years. The sex ratio (F/M) was 2.67. Nearly 97% of respondents had at least a Bachelor's degree. The majority, comprising 62.70%, were married. Participants primarily hailed from Settat (n=81), although significant numbers also came from Casablanca (n=62) and Bouskoura (n=6). The remaining nine came from nearby towns. The professional distribution included 92 versatile nurses, 24 midwives, 24 anesthetic nurses, 8 radiology technicians, and 8 other laboratory technicians. Notably, 37.34% of respondents reported no diagnosed diseases, while the median number of diagnosed diseases was one (Q1 - Q3: 0 - 2). We have identified 14 diseases in total, in descending order of frequency: neurological disorders (anxiety and depression – 37.97%), musculoskeletal disorders (arthritis, osteoporosis, and degenerative spinal disease – 22.99%), gastrointestinal disorders (13.37%), respiratory disorders (asthma and pulmonary disease – 9.09%), endocrine disorders (thyroid disease (Hashimoto) and diabetes – 6.95%), sensory disorders (visual deficits and

Table 1. General characteristics (overall and by hospital hierarchy)

| General characteristics | Overall n (%) | Hospital hierarchy | | $\chi^2$ (p-value) |
|---|---|---|---|---|
| | | Provincial hospital n (%) | Local hospital n (%) | |
| **Gender** ($n_{active}$=158) | | | | 7.04[a] (0.008) |
| Female | 115 (72.80) | 53 (46.09) | 62 (53.91) | |
| Male | 43 (27.20) | 30 (69.77) | 13 (30.23) | |
| **Educational level** ($n_{active}$=158) | | | | 1.93c (0.628) |
| Bachelor's degree | 117 (74.10) | 59 (50.43) | 58 (49.57) | |
| Master's degree | 28 (17.70) | 15 (53.57) | 13 (46.43) | |
| Doctorate | 8 (5.10) | 5 (62.50) | 3 (37.50) | |
| Other | 5 (3.20) | 4 (80.00) | 1 (20.00) | |
| **Marital status** ($n_{active}$=158) | | | | 4.58c (0.156) |
| Single | 53 (33.50) | 22 (41.51) | 31 (58.49) | |
| Married | 99 (62.70) | 57 (57.58) | 42 (42.42) | |
| Divorced | 5 (3.20) | 3 (60.00) | 2 (40.00) | |
| Separated | 1 (0.60) | 1 (100.00) | 0 (0.00) | |
| **Residence** ($n_{active}$=158) | | | | 67.57c (<0.001) |
| Settat | 81 (51.30) | 67 (82.72) | 14 (17.28) | |
| Casablanca | 62 (39.20) | 12 (19.35) | 50 (80.65) | |
| Other | 9 (5.70) | 4 (44.44) | 5 (55.56) | |
| Bouskoura | 6 (3.80) | 0 (0.00) | 6 (100.00) | |
| **Specialization** ($n_{active}$=156) | | | | 4.41c (0.360) |
| Versatile nurse | 92 (58.20) | 45 (48.91) | 47 (51.09) | |
| Midwife | 24 (15.20) | 11 (45.83) | 13 (54.17) | |
| Anesthesia nurse | 24 (15.20) | 16 (66.67) | 8 (33.33) | |
| Radiology technician | 8 (5.10) | 6 (75.00) | 2 (25.00) | |
| Laboratory technician | 8 (5.10) | 4 (50.00) | 4 (50.00) | |
| **Illness diagnosis** ($n_{global}$=158) | | | | 1.73a (0.188) |
| Presence | 99 (62.66) | 56 (56.57) | 43 (43.43) | |
| Absence | 59 (37.34) | 27 (45.76) | 32 (54.24) | |

When the condition for applying the chi-square test is valid, the chi-square test is used (a). Otherwise, the Yates correction (theoretical frequency between 3 and 5) (b) or the Fisher exact test (theoretical frequency less than 3) (c) is used.

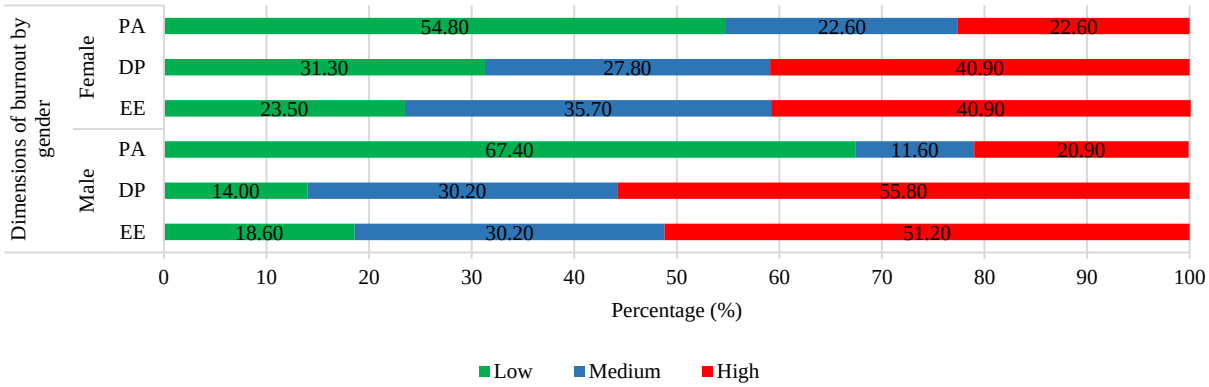


Figure 1. Categorization of burnout risk within each dimension by gender.
*(PA = Personal Accomplishment; DP = Depersonalization; EE = Emotional Exhaustion)*

hearing deficits – 5.88%), and cardiovascular disorders (heart failure or arrhythmia, and peripheral vascular disease – 3.74%).

In terms of gender, the median age for women was 35 years (Q1 – Q3: 29 – 39), while for men, it was 37 years (Q1 – Q3: 32 – 43), with no statistically significant difference (z= -1.80; p=0.072). Similarly, the distribution of the number of diagnosed diseases was evenly spread across both sexes (z= -0.25; p=0.800). Interestingly, there was a notable contrast in the average age of participants between the provincial (M=37.90; SD=8.55) and local (M=33.52; SD=7.32) hospitals, with a significant discrepancy found (t=3.44; p=0.001). Gender exhibited a highly important but moderately intense association with hospital hierarchy ($\chi^2$= 7.04; p<0.01; $V^2$=0.21), while place of residence showed a strong and highly significant correlation with hospital hierarchy ($\chi^2$= 67.57; p<0.001; $V^2$=0.64). The number of diagnosed diseases is identically distributed between the two hierarchies of hospitals (z= -0.96; p=0.334). The qualitative characteristics identified are recorded in Table 1.

## Description of burnout and resilience

The mean score for EE stood at 28.44±12.90, for DP at 9.96±6.47, and for PA at 29.01±10.48. The distribution of burnout levels across these three dimensions indicates that 43.7% and 45.0% of respondents report experiencing high levels of EE and DP, respectively. Conversely, over 58.0% of respondents demonstrate low levels of PA. The average resilience score was 23.78±7.71. According to the statements on resilience, the majority express uncertainty about their ability to stay focused under pressure and are unsure about their capability to handle stressful situations.

Both men and women exhibit similar patterns of burnout. EE levels demonstrated no significant difference (t=0.72; p=0.473) between women (M=27.99; SD=13.03) and men (M=29.65; SD=12.61). This trend is also evident in DP (t=1.57; p=0.118) between women (M=9.47; SD=6.75) and men (M=11.28; SD=5.51), as well as PA (t= -1.59; p=0.115) between women (M=29.82; SD=10.37) and men (M=26.86; SD=10.60). Figure 1 depicts the distribution of burnout levels across its three dimensions, categorized by gender.

The graphical representation shows that feelings of EE and DP are high among men, at 51.2% and 55.8%, respectively, compared to women (identical rates, 40.9% for both feelings). The sense of PA is lower among men, exceeding 67.0% of the total group.

According to gender, most men said that under pressure, they cannot remain focused, but also that managing stress does not make them strong. Most

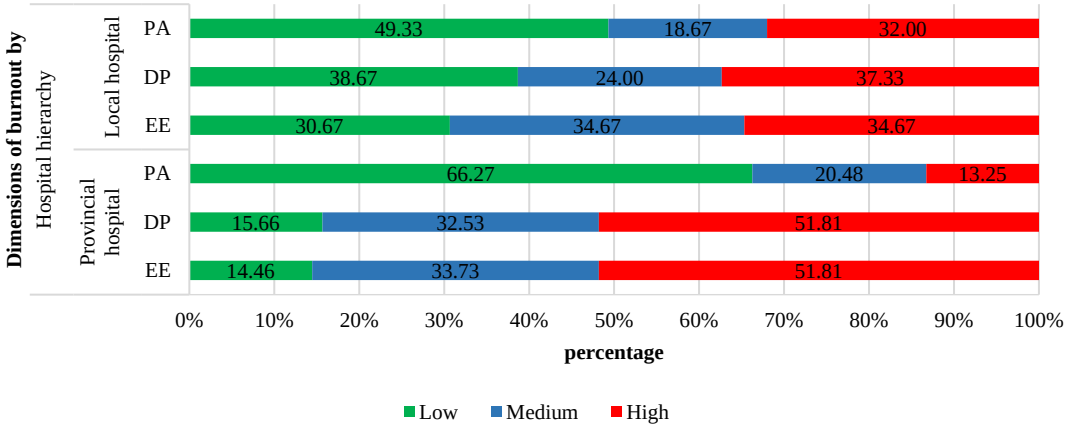


Figure 2. Categorization of burnout risk within each dimension by hospital hierarchy.
*(PA = Personal Accomplishment; DP = Depersonalization; EE = Emotional Exhaustion)*

Table 2. Correlation study between resilience and burnout dimensions in men (n=43) vs women (n=115).

| Dimensions | MS ± SD Women | MS ± SD Men | r of Pearson 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| **Resilience** | 23.99 ± 7.80 | 23.37 ± 7.47 | 1 | -0.32 $p$<0.01 | -0.19 $p$<0.05 | 0.49 $p$<0.001 |
| **Feeling of emotional exhaustion** | 27.99 ± 13.03 | 29.65 ± 12.61 | -0.40 $p$<0.01 | 1 | 0.59 $p$<0.001 | -0.08 $p$=0.364 |
| **Feeling of depersonalization** | 9.47 ± 6.75 | 11.28 ± 5.51 | -0.21 $p$=0.166 | 0.52 $p$<0.001 | 1 | -0.21 $p$<0.05 |
| **Feeling of personal accomplishment** | 29.82 ± 10.37 | 26.86 ± 10.60 | 0.71 $p$<0.001 | -0.27 $p$=0.075 | -0.30 $p$=0.051 | 1 |

MS ± SD: Mean Score ± Standard Deviation; 1: Resilience; 2: Feeling of emotional exhaustion; 3: Feeling of depersonalization; 4: Feeling of personal accomplishment

women said that under pressure, they cannot remain focused. The response 'Neutral' was observed more often among men than among women. Statistically, for the statement 'I can handle unpleasant feelings', we note a significant difference between the responses given by women and those given by men (V=0.25; p=0.041). However, resilience was similar (t= -0.41; p=0.682) between women (M=23.94; SD=7.82) and men (M=23.37; SD=7.47).

Between hierarchies of healthcare facilities, the feeling of EE was significantly different, with t=2.83 and p=0.005 (provincial hospital (M=31.14; SD=12.78) vs local hospital (M=25.45; SD=12.44)). The feeling of DP was significantly different, with t=2.79 and p=0.006 (provincial hospital (M=11.30; SD=6.07) vs local hospital (M=8.48; SD=6.62)). The sense of PA was significantly different, with t= -2.89 and p=0.004 (provincial hospital (M=26.77; SD=10.18) vs local hospital (M=31.49; SD=10.31)). Figure 2 illustrates the distribution of burnout levels across its three dimensions, according to the healthcare facility hierarchy.

The graphical representation shows that feelings of EE and DP are notably higher at the provincial hospital, with a similar percentage of 51.8%, compared to the local hospital, where they stand at 34.7% and 37.3%, respectively. The sense of PA is even lower at the provincial hospital (exceeding 66.0%).

In terms of resilience, there is a significant difference between the two hierarchies of the hospital, with a t-score of -2.77 and p-value of 0.006 (provincial hospital: M=22.20; SD=7.79 vs local hospital: M=25.53; SD=7.27). Analysis of individual responses reveals that healthcare professionals at the local hospital generally exhibit more favorable attitudes, displaying positive psychophysiological signs compared to their counterparts at the provincial hospital. Neutral responses are more prevalent among participants from the provincial hospital. Significant disparities are only observed in responses to 'Coping with stress can strengthen me' (V=0.31; p=0.004) and 'I can handle unpleasant feelings' (V=0.27; p=0.025).

## Relationship between resilience and burnout

To answer our research question, we examined the correlation between resilience and the various dimensions of burnout within our study sample. We found a significant correlation between resilience and each of the dimensions of the MBI scale. Specifically, resilience decreases as PA diminishes (r=0.54; p<0.001), while it reduces with increasing levels of EE (r= -0.34; p<0 DP (r= -0.20; p<0.05).

Among male participants, a significant correlation was found between resilience and feelings of EE and PA. Conversely, among female participants, a significant correlation was found between resilience and all three burnout dimensions (see Table 2).

At the local hospital, we found a positive correlation between resilience and the sense of PA. No correlations were observed with other burnout dimensions. Conversely, at the provincial hospital, resilience showed a negative correlation with EE and a positive correlation with the sense of personal agency (PA). The findings of this correlation study are summarized in Table 3.

Through MCA, the five variables studied revealed two underlying factors, which captured 64.8% of the data's inertia. Two clusters were formed. The first one associates the Provincial Hospital with high EE, high DP, low PA, and low resilience. The second one associates the

Table 3. Correlation study between resilience and burnout dimensions in a provincial hospital (n=83) vs a local hospital (n=75).

| | | Local hospital 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| **Provincial hospital** | **Resilience** | | | | |
| | Rho | 1 | -0.14 | -0.18 | **0.37** |
| | *p-value* | | 0.228 | 0.117 | **<0.01** |
| | **Feeling of emotional exhaustion** | | | | |
| | Rho | **-0.36** | 1 | **0.49** | 0.07 |
| | *p-value* | **<0.01** | | **<0.001** | 0.527 |
| | **Feeling of depersonalization** | | | | |
| | Rho | -0.21 | **0.56** | 1 | -0.18 |
| | *p-value* | 0.054 | **<0.001** | | 0.116 |
| | **Feeling of personal accomplishment** | | | | |
| | Rho | **0.64** | -0.20 | **-0.34** | 1 |
| | *p-value* | **<0.001** | 0.064 | **<0.01** | |

1: Resilience; 2: Feeling of emotional exhaustion; 3: Feeling of depersonalization; 4: Feeling of personal accomplishment

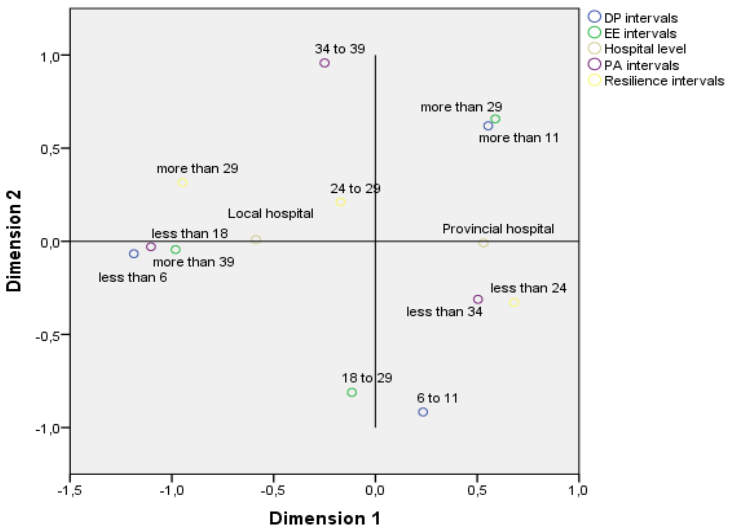


Figure 3. Mapping of the modalities of the variables in the factorial plane of the two dimensions extracted.
*(PA = Personal Accomplishment; DP = Depersonalization; EE = Emotional Exhaustion)*

Local Hospital with low EE, low DP, high PA, and high resilience (Figure 3).

The distances between the variable points, indicating the degree of association between the variables, are clearly shown in Figure 4.

## Discussions

The present study measured the burnout and resilience of healthcare professionals in the Casablanca-Settat region, the most densely populated area in Morocco. The results reveal interesting trends that warrant thorough analysis and consideration in human resource management within healthcare. After finding the middle score of responses related to resilience, it was observed that most respondents selected “neutral” or “rather yes,” indicating that the participants were resilient in dealing with the challenges encountered in their daily work. This is further evidenced by a prior study on resilience development among intensive care workers that reported how everyday resilience is in the healthcare practice; most of the healthcare personnel offer so much of their emotions and selves while caring for the clients (Hancock *et al.*, 2020). Heltty and Zahalim's (2023) study of resilience after stroke illustrates how high levels of resilience can overcome extreme challenges, thereby improving functional outcomes. In our study, these same principles manifest themselves in a positive correlation between resilience and an increased sense of personal accomplishment among healthcare professionals, underscoring their protective role in high-pressure environments. The development of resilience among healthcare workers could thus serve as a protective measure against the adverse effects of work and a way to bolster individual healthcare providers’ resources against emotional exhaustion and job burnout.

In our study, levels of EE, DP, and PA were identical between both sexes. However, Maslach and colleagues report that different components of the burnout syndrome may be distributed unevenly based on gender; women may suffer more from EE and lack of PA, while

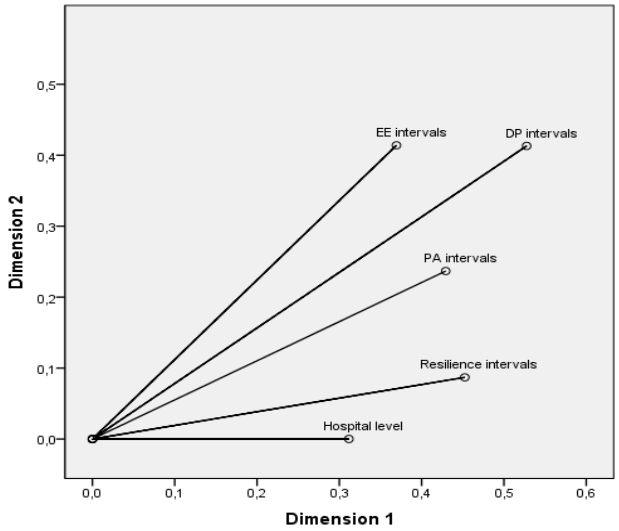


Figure 4. Mapping of the variable points of the variables in the factorial plane of the two dimensions extracted.
*(PA = Personal Accomplishment; DP = Depersonalization; EE = Emotional Exhaustion)*

men may exhibit more dehumanization in relationships (Maslach, Schaufeli and Leiter, 2001). Women report significantly higher burnout rates than men, and this gap can be explained mainly by job expectations, with burnout depending on the extent to which a worker's job aligns with their expectations and preferences (Artz, Kaya, and Kaya, 2022). Mean resilience scores were also identical between both sexes, which contradicts findings from a recent meta-analysis where resilience levels were higher in men (Gök and Koğar, 2021).

The distribution according to the hierarchy of healthcare facilities revealed significant differences in terms of age, gender, and place of residence between the provincial hospital and the local hospital. The MBI scale showed high levels of EE and DP, particularly pronounced in the provincial hospital. These differences may be influenced by the distinct nature of the missions and services offered by each hierarchy within the facility, as well as the workload and the population served, which may exceed the facility's capacity, especially at the provincial hospital. Our interpretations align with other literature that highlights the problem of stress and burnout among healthcare staff, primarily due to intensive workloads. Indeed, heavy workloads in hospitals are significant contributors to burnout (Jose, Dhandapani, and Cyriac, 2020). The results of the CD-RISC 10 scale showed an average score for resilience; significant differences were observed in the responses regarding the ability to manage stress and adapt to changes.

The correlation research depicted relationships between dimensions of resilience and burnout. Resilience correlated positively with PA, which meant that the strengthening of this coping resource could be one of the strategies for the reduction of burnout. It is negatively correlated with EE and DP. These results confirm that studies show resilience has a beneficial influence in preventing burnout (Vercio *et al.*, 2021). In a study by the same authors, but conducted in Canada, they evaluated the effects of burnout on healthcare workers, their families, and the care provided to patients (Hancock *et al.*, 2020). The impact on professionals' mental health may lead them to build resilience. Others have looked at how resilience becomes a protective factor in the attenuation of the negative effects of psychological violence on professional empathy (Li, Liao, and Ni, 2024).

A survey conducted among nurses with high levels of burnout reveals that resilience, although moderate, has significant implications for the quality of life at work (Howie-Esquivel *et al.*, 2022). Additionally, resilience has a substantial direct effect on burnout in other professions, as indicated by the study of Lee *et al.* (2019). Even among medical students, a positive correlation between stress and burnout has been observed, with resilience acting as a partial mediator (Liu and Cao, 2022). Findings have indicated that these behaviors are significantly associated with better emotional flourishing and emotional recovery, offering valuable insights for enhancing the resilience of healthcare professionals (Rink *et al.*, 2022). Another study examined the role of transformational leadership in mitigating burnout among hospital employees. It demonstrated that transformational leadership significantly reduces burnout, with resilience and role clarity serving as significant mediators. Intrinsic motivation also has a conditional indirect effect in this dynamic, highlighting the importance of transformational leadership in healthcare facilities (Chen *et al.*, 2022).

Our research provides evidence of the undeniable correlation between burnout and resilience in the medical community. This complex relationship underscores the importance of thoughtful consideration for improving working conditions in the healthcare field. The problem is multidimensional; therefore, intervention strategies and support systems should be oriented towards the overall well-being of healthcare professionals. It's also a way of identifying other protective factors, including organizational engagement and job satisfaction, which will be marked as crucial future research endeavors. It is using this avenue that concrete avenues develop for establishing effective strategies for the prevention and mitigation of burnout among healthcare workers.

The present study highlights several strengths. The study focused on healthcare professionals from different specialties. Most participants had expressed a negative impact of burnout on their physical and mental well-being and the development of resilience following this mental distress. The compatibility of the results with previous studies could affirm the relationship between burnout syndrome and resilience among healthcare professionals. The response rate of over 50% of the total healthcare staff across the various sites studied makes the results significant and conclusive. The study was conducted at three different sites, including two distant cities and hospitals with diverse services and specialties. However, some limitations should be considered: the cross-sectional nature rather than longitudinal of the data does not allow for studying the relationship and direction of causality between resilience and burnout; the study concerns three sites chosen for convenience, so the findings cannot be applied systematically to other public sector sites in the region; and the fact that we limited ourselves to the public sector.

## Conclusion

This study offers significant insights into resilience and burnout among healthcare personnel in Morocco. Similar patterns emerged between the two genders, while different patterns were observed between the two hospital hierarchies. The local hospital environment could well promote resilience and reduce the likelihood of burnout among healthcare professionals. Globally, the

results underline the need to implement targeted policies and interventions to enhance resilience, reduce burnout, and improve the quality of work life for healthcare professionals. Considering our research, we propose several actions that we consider prioritized, essential, and achievable in managing burnout among healthcare professionals, which are applicable in the healthcare setting. Training and educating healthcare professionals will help them to be aware of and prevent burnout, empowering them to recognize and address symptoms at an early stage. No less crucial will be equitable distribution of staff between and within medical services, according to each service's needs and the nature of care provided, to optimize workload and reduce pressure. Developing peer support through specific areas for conversation and mutual reflection can promote team cohesion and affective resilience. In addition, enhancing mobility for healthcare professionals between services, when feasible, and respecting individual professional inclinations may increase motivation and mitigate monotony. Incorporating quality of work life into institutional planning, as well as providing evident recognition of healthcare professionals' contributions, can significantly improve morale and motivation. Finally, listening to professionals and acknowledging concerns, with response and remediation, leads to an enhanced, committed, and contented workforce. These action-oriented measures, which explicitly addresses the issues unearthed by our study, can contribute to achieving a healthier and more sustainable workplace.

## Acknowledgments

The authors would like to express their sincere gratitude to the delegations for authorizing them to conduct the survey and to all the staff for their cooperation and participation.

## Funding source

This study was funded by University Hassan First's own fund [grant number FP/2020/02]. The funding body had no involvement in the design of the study, the data collection, the analyses and interpretation, or the manuscript preparation.

## Availability of data and materials

The data presented in the current study are available upon reasonable request from the corresponding author. The data are not publicly available due to privacy.

## Authors' contributions

HG, HH, and FH contributed to the conception and design of the study. HG, AEA, and WF were responsible for data gathering, scrutiny, and initial analysis. HH and FH conducted further statistical analyses and interpreted the results. SJ, JB, NH, IC, AH, and FH provided critical revisions and supervised the overall research process. All authors contributed to the writing of the manuscript, reviewed it, and approved the final version for submission.

## Declaration of Interest

All authors declared no conflict of interest.

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**How to cite this article:** Guider, H., Jaouhar, S., Bouzid, J., Fadil, W., Himmouche, N., Cigarroa, I., Alaiki, A. E., Hilali, A., Hami, H., and Hadrya, F. (2025) 'Burnout and Resilience among Moroccan Healthcare Professionals: A Comprehensive Multi-Hospital Study', *Jurnal Ners*, 20(2), pp. 154-163. doi: http://dx.doi.org/10.20473/jn.v20i2.65721