

Self-efficacy, perceptions of context, and burnout: a multilevel study on nurses

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KEY WORDS

Nursing burnout; perceptions of context; self-efficacy

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Burnout negli infermieri; percezioni di contesto; autoefficacia

SUMMARY

Background: *The role of personal and situational factors in burnout development in the hospital context is well known. The majority of studies used standardized and generic scales and focused exclusively on the individual level of analysis, underestimating the role of teamwork effects.* **Objectives:** *This study adopted a contextualized and multilevel approach in order to examine the different roles of individual and unit level nurse efficacy beliefs and hospital perceptions of context in predicting job burnout.* **Methods:** *Nurses (N=1020) belonging to 118 units completed two measures specifically tailored for the nursing environment: nurse self-efficacy, perceptions of context (teamwork, supervisor, management, and workload) together with MBI-GS exhaustion and cynicism scales. Multilevel confirmatory factor analysis was performed in order to verify the internal validity of nurse self-efficacy and hospital perceptions of context scales. A multilevel structural equation model was tested at individual and unit levels, using nurse self-efficacy, hospital perceptions of context and age as predictors of exhaustion and cynicism.* **Results:** *The good psychometric properties of the scales were confirmed. At individual level, nurse self-efficacy was the strongest predictor of both burnout dimensions. Exhaustion was also predicted by perception of workload and perception of management, while cynicism was also predicted by perceptions of teamwork, workload, and age. At unit level, perceptions of workload and teamwork emerged as predictors of unit exhaustion and cynicism, respectively.* **Conclusions:** *Based on our results, it is possible to plan distinct individual and/or unit-focused interventions in order to prevent hospital staff burnout.*

RIASSUNTO

«**Autoefficacia, percezioni di contesto e burnout: uno studio multilivello sugli infermieri**». **Introduzione:** *E' ben nota la rilevanza dei fattori personali e situazionali sull'insorgenza del burnout in ambito ospedaliero. La maggior parte degli studi ha utilizzato scale standard e generiche e si è focalizzata unicamente sul livello di analisi individuale, sottostimando il ruolo degli effetti a livello di gruppo di lavoro.* **Obiettivi:** *Lo studio qui presentato adotta un approccio contestualizzato e multilivello per esaminare il diverso ruolo dell'efficacia personale dell'infermiere e delle percezioni di contesto, specificamente riferite all'ospedale, a livello individuale e di gruppo (unità operativa)*

Pervenuto il 9.10.2013 - Revisione pervenuta il 26.2.2014 - Accettato il 3.4.2014

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nel predire il job burnout. **Metodi:** Un campione di 1020 infermieri, facenti parte di 118 unità operative, ha compilato le seguenti scale: autoefficacia dell'infermiere, percezioni di contesto (percezione del teamwork, del capo, del management e del carico di lavoro), MBI-GS (esaurimento e disaffezione lavorativa). In primo luogo è stata effettuata un'analisi fattoriale confermativa multilivello per verificare la validità interna delle scale di autoefficacia e percezioni di contesto. E' stato poi testato un modello di equazioni strutturali multilivello a livello individuale e di unità operativa, utilizzando l'autoefficacia, le percezioni di contesto e l'età come predittori di esaurimento e disaffezione lavorativa. **Risultati:** Le proprietà psicometriche delle scale sono risultate adeguate. A livello individuale, le convinzioni di autoefficacia dell'infermiere emergono come il predittore più forte di entrambe le dimensioni del burnout. La percezione del carico di lavoro e la percezione del management predicono l'esaurimento; mentre la percezione del teamwork, del carico di lavoro e l'età predicono la disaffezione lavorativa. A livello di unità operativa, la percezione del carico di lavoro e del teamwork predicono rispettivamente l'esaurimento e la disaffezione lavorativa. **Conclusioni:** Sulla base dei risultati, è possibile impostare interventi differenziati a livello individuale e/o di unità per prevenire/ridurre il burnout.

INTRODUCTION

In the past fifteen years, public hospitals have been confronted with a number of organizational challenges related to increasing competition, financial cutbacks in public funding and the increasing number of patients (1, 42). As a result of this complex and demanding scenario the attention of researchers and practitioners is drawn to the increasing occupational hazards and psychosocial risk factors in the hospital setting. Much research has been undertaken on burnout, representing the prototypical chronic stress among nurses, on its causal factors, mostly emphasizing the role of situational factors (45). Of these, task characteristics, such as nurses' overload, have been found to have a consistent relationship with burnout (41, 46). Moreover, the role of a positive social environment has often been found to protect nurses from burnout (45, 55). Recent studies, however, stressed the role of personality factors as potential antecedents of burnout (2). In particular, self-efficacy beliefs were recognized as predicting better adjustment to one's environment and lower levels of strain across various professions (2, 6, 35).

The large majority of stress and burnout research focused exclusively on the individual level of analysis, considering the role of individual perceptions of the work environment and underestimating the role of teamwork effects (12). However, there is evidence that burnout is affected by team-level charac-

teristics, such as shared perceptions of the work environment (12, 57). Since in the hospital setting nurses are nested in interdependent workgroups, namely hospital units, nurses working in the same team are likely to share perceptions, beliefs, moods and behavioural patterns (49).

The present study investigated the role of specific nurse self-efficacy beliefs together with perceptions of context (14, 15) referred to the hospital environment (17), both concepts framed within Social Cognitive Theory (SCT, 8) as potential antecedents of burnout dimensions. The main contribution of the research was to investigate such relationships simultaneously at the individual and unit level, in order to identify the different patterns of relationships between individual and unit level perceptions of context and self-efficacy beliefs and burnout dimensions.

As self-efficacy beliefs are domain-specific, their measurement needs to be tailored and framed around the activities that a nurse has to perform. Similarly, perceptions of context were operationalized on the basis of prototypical contextual social and task features referred to the nursing environment (17). Such measures have to be tailored to a specific situation or occupation, paying greater attention to specific environmental features related to the work context. Hence, in the current study we generated two tailored measures of self-efficacy and perceptions of context and validated them both at the individual and unit level of analysis.

Then, following Schaufeli and Taris (52), in the present study we focused on the two core burnout dimensions, namely exhaustion and cynicism, corresponding to the energetic and motivational components which are strongly associated with each other and both necessary to describe the burnout syndrome. On the contrary, professional efficacy seems to develop quite independently and has not always been considered as a genuine burnout component (52). Hence, considering that burnout dimensions may be differently related with individual and situational factors, we investigated the role of exhaustion and cynicism as correlated but separate constructs.

Specific predictors of nurses' burnout: the role of perceptions of context and self-efficacy

Both task and social factors were extensively associated with burnout (41). With reference to the social environment, social support is clearly considered the most protective factor against the syndrome for health care professionals (41, 28, 43). Nevertheless, a certain disagreement exists on how it should be conceptualized and measured (22). The notion of social support represents a comprehensive concept encompassing different sources, such as supervisor or colleagues. However positive interaction with the direct supervisor, which involves guidance and feedback, is intrinsically different from the positive interaction among colleagues, which implies friendship, help, and comfort (43). In fact, supervisors' support was mostly related to the exhaustion component of burnout, whereas co-workers' support was related to both the exhaustion and cynicism dimensions (41, 55). Moreover, as the notion of social support may apply to all work settings, definition and operationalizing of the wider social environment did not always take into account the specific features of the hospital context. For example, a specific social dimension which has been far less investigated is the relationship between nurses and physicians and their ability to work together synergistically within the unit, which in some studies seems to affect nurses' well-being, more so than their relationship with other nurses (32, 39). Another social feature

that may be critical in the hospital context, due to the recent changes towards more managerial governance (1), can be ascribed to the hospital management. The perceptions of hospital governance, involving perceived fairness, policy, reward and communication, may also affect nurses' well-being (44). However, in burnout research, it represents a far less investigated aspect of the social environment.

A construct that attributes particular relevance to the discrete and specific dimensions of the work context is "perceptions of context" (PoC) (14, 15) measuring the perceptions of the prototypical features of the work environment. Consistent with the recent definition of context and with the distinction between social and task elements that comprise discrete context (36), Borgogni and colleagues introduced this concept in order to study separately, but simultaneously, the perception of both social and task aspects of the workplace context. At the social level, PoC refer to the perceptions of specific social components that are structurally determined in a given organization and to the way they fulfil their social roles and interact reciprocally. This concept aims to overcome the rigidity of the scales already present in the literature that comprise a standardized set of items, through a flexible tool that allows valuing the specificity of each organizational context. Moreover, by explicitly focusing on the *perception* of these components, PoC emphasize the role played by the individual in perceiving the more salient aspects of the observed phenomena. PoC are different from similar concepts already present in the literature, such as Perceived Organizational Support (POS) or Perceived Supervisory Support (PSS) (23), and Organizational Climate. The scales of POS or PSS (23) refer both to the productive aspect of interaction in addition to the relational aspect, but identify the same features irrespective of the organizational context. However, PoC identify behaviour that is prototypical of each context and that, for this reason, manifest themselves differently within organizations. While POS and PSS refer to something that either the organization or the supervisor is perceived to do specifically for the person, in PoC scales the phrasing is "impersonal" or "general", such that the person perceives the organization's or the supervisor's behav-

our directed to all the employees/team members. As compared to climate, PoC identify distinct and specific facets that are commonly experienced by employees in the workplace rather than a “global” climate (34). Even when climate is defined as “facet-specific” (e.g., climate for safety, service, innovation (59) it designates specific “topics” of interest in a given organization, whereas PoC are more explicitly focused on different social referents, as structurally defined (e.g., immediate supervisor). Based on the specificity of hospital settings and on the quoted literature, three prototypical and meaningful social features of the hospital context were identified and included in the current study: (a) perception of nurse-physician teamwork, (b) perception of the nurse supervisor, and (c) perception of hospital management. At the task level, the perception of workload was also included, as a prototypical task dimension related to nurse burnout which appears to be increasing in current hospital settings (27).

In this study, we assumed that perception of workload, requiring an extra effort to manage it, will deplete the individual energies, hence will be primarily related to the energetic component of burnout (exhaustion). Similarly, we assumed that the perception of the direct supervisor (namely the nurse manager), since it is strongly connected to the organization of activities and work shift (41, 55), will be mostly related to exhaustion as well.

On the other hand, the perception of lack of integration and synergy with other nurses and physicians within the team and the perception of lack of support and equity in the hospital management are likely to affect mostly the motivational dimension of burnout, namely cynicism. Hence, we tested the following hypotheses:

H1: Perception of workload and perception of direct supervisor are primarily related to exhaustion (positively and negatively respectively)

H2: Perception of teamwork and perception of top management are primarily and negatively related to cynicism

Together with contextual features, individual characteristics were recognized as contributing to

burnout (2, 40). Self-efficacy, namely the beliefs in one’s capabilities to organise and carry out the courses of action required to achieve given goals (8), is crucial in shaping the relationship between the person and the environment, thus affecting the likelihood of a match or mismatch between employees and their job. The construct of self-efficacy, grounded in the framework of social cognitive theory, emphasizes the proactive and intentional role played by individuals, self-regulating and reflecting on their own behaviour. Self-efficacy affects how stressors and negative emotions are managed (6, 50).

Following Bandura’s definition (6, 7), self-efficacy is intrinsically a specific construct, thus “the ‘one measure fits all approach usually has limited explanatory and predictive value because most of the items in an all-purpose test may have little or no relevance to the domain of functioning” (7, p. 307). Since the more specific the self-efficacy beliefs are, the more predictive they become (50), a tailored self-efficacy scale was developed, emphasizing social and task requirements and circumstances specific to nurses’ work.

Given the intentional role played by self-efficacy beliefs in the burnout process, we assumed that nurses’ beliefs of being able to master work problems and requirements provide them with the energy and motivation to cope with difficulties and obstacles. Thus, nurses will experience less fatigue (exhaustion) and a less negative and distant attitude towards work (cynicism).

We therefore tested the following hypothesis.

H3: Nurse self-efficacy is negatively related with both exhaustion and cynicism

The role of unit level characteristics on nurses’ burnout

In the hospital environment, nurses are organized in interdependent groups, namely units, in which they are expected to integrate with colleagues and other professionals (42). Nurses working in the same unit perform similar activities, respond to the same supervisor and share similar work experiences. Therefore, nurses can be consid-

ered structurally, psychologically and socially embedded within the unit, which probably represents a meaningful level of analysis within the hospital setting.

As anticipated, people working in stable teams or units tend to share perceptions, beliefs, moods, as well as behavioural patterns (49). This is the case of feelings of burnout that have been found to crossover among hospital staff, due to a process of emotional contagion (5).

Moreover, cross-level studies investigated the role of shared perceptions of the work environment (e.g. shared perceptions of workload and control) on stress and burnout (56, 57) in order to better understand the role of workgroup context for psychological well-being.

Also self-efficacy beliefs tend to be partly shared by team members, as individual self-beliefs are not detached from the interactive dynamics operating within the group. As people assess themselves through comparison with others similar to them, social modelling may have negative as well as positive influences on self-efficacy, since observing other nurses succeeding or failing is likely to influence a person's self-efficacy (47, 19).

All in all, we posit that in the hospital setting, nurse efficacy beliefs, perceived working conditions and feelings of burnout are to some extent shared by team members, through similar work experiences and social interaction processes.

In the present study, we adopted a multilevel approach (MSEM) that is able to distinguish effects pertinent to the unit level from effects pertinent to the individual level by partitioning the variance in two latent components, namely a *between* groups (or unit) level, and a *within* groups (or individual) component, allowing unbiased estimate of structural parameters estimated at the *between* and *within* level (38, 48). Assuming that all variables of interest have *within* group and *between* group variances, the same model can be simultaneously estimated at both unit and individual levels, highlighting similarities and differences of the underlying processes (38).

Hence, in our study we aimed to explore to what extent team level nurse self-efficacy and team level perceptions of context may explain team level dif-

ferences in burnout (exhaustion and cynicism). In particular, we assumed that the higher the shared perceptions of workload, the higher will be the level of exhaustion at the team level. Similarly we assumed that the more negative are the perceptions of nurse management, the higher will be the level of exhaustion. On the other hand, we assumed that the more negative are the shared perceptions of teamwork and hospital management the higher will be the level of cynicism within the unit. Hence, we tested the following hypotheses at the team level:

H4: Unit level perception of workload and unit level perception of nurse manager are primarily related to unit level exhaustion (positively and negatively respectively).

H5: Unit level perception of teamwork and unit level perception of top management are primarily and negatively related to unit level cynicism.

METHOD

Participants and procedures

The initial sample consisted of 1759 professional nurses from an Italian public hospital who were individually administered an anonymous questionnaire that measured the exhaustion and cynicism dimensions of burnout, perceived self-efficacy, and perceptions of context. Each participant received from the nurse manager a presentation letter along with the questionnaire that briefly described the purpose of the project. A cardboard box (for collection of the questionnaires) was placed in each hospital unit, in order to guarantee privacy of the respondents. The data had a hierarchical structure, with individual-level measures nested within 118 different hospital units. A total of 1020 questionnaires were returned, yielding a response rate of 58%. All hospital units were represented, with an average of 9.2 nurses per unit (SD=6.23).

Respondents (70% female) were aged 18-35 years (37.4%), 36-45 years (39.0%), and over 45 years (23.6%). In terms of education, 26.1% had completed junior high school, 56.5% had complet-

ed senior high school, and 17.4% had a university degree. About 45% of the sample had more than 11 years of organizational tenure.

Measures

Perceptions of context

Items of the four PoC scales were generated following two focus group interviews with nurses, which were designed to elicit the social and task expectations of the nursing work environment. On the basis of content analysis of interviews, a pool of 17 items was formulated and validated in a previous validation study (17) with a 7-point Likert type response scale ranging from 1="Strongly disagree" to 7="Strongly agree." These items referred to:

a) *PoC - Teamwork*. Four items measured the perception of harmony and the degree of collaboration in the unit among physicians and nurses working towards a common goal (e.g. "Nurses and physicians on the team cooperate with each other in order to best carry out their jobs").

b) *PoC - Supervisor*. Three items measured the perception of the nurse supervisor's leadership style in facilitating people's development and promoting equity within the unit (e.g. "My supervisor treats all employees equally").

c) *PoC - Management*. Seven items measured the perception of the management style of top-level superiors, in terms of operational policies and resources available (e.g. "In this hospital, hospital management assures the space and materials that are needed").

d) *PoC - Workload*. Three items measured the perception of the quantity of work that nurses have to do in the unit, as well as the ratio of patients to staff (e.g. "In this unit there are too many patients compared to the number of employees available").

A Multilevel Confirmatory Factor Analysis (MCFA) was performed on the 17 items to ascertain the internal validity of the scales (31) using the EQS programme (11), which operationalizes the strategies developed by Bentler and Liang (10) for performing multilevel analysis within the framework of structural equation modelling. The hy-

pothesized four-factor model yielded an adequate fit, $\chi^2(226)=566.58$, $p<0.001$; CFI=0.990; RMSEA=0.040 (0.036, 0.044); SRMR=0.038. The factor loadings of the items related to the same underlying construct were all high and significantly different from zero, providing support for the convergent validity of the scales. They ranged from 0.37 to 0.83 (M=0.71; SD=0.13) at the individual level, and from 0.71 to 0.92 at the unit level (M=0.83; SD=0.09).

Self-efficacy

Consistent with Bandura's recommendations for construct specificity (7), nursing self-efficacy was measured by 15 items regarding beliefs of being able to handle nursing tasks, emergencies, and interpersonal relationships with colleagues and patients. Since "self-efficacy appraisals reflect the level of difficulty individuals believe they can surmount" (7, p. 311), two focus group interviews with nurses were conducted using Flanagan's critical incident technique (24), in order to generate self-efficacy items that were grounded in the prototypical organizational behaviours that nurses use to face difficult situations. These items were framed as statements of job-related beliefs of being able to face critical situations at work (e.g. "I'm always able to keep calm when there are some misunderstandings with patients and their relatives"; "I'm always able to accomplish even the most unpleasant jobs" or "I'm always able to effectively integrate myself with all the colleagues working in other units"). The 7-point Likert type response scale ranged from 1="Strongly disagree" to 7="Strongly agree."

A MCFA was performed on the 15 items of the self-efficacy scale. The one-factor model had a chi-square of 594.52, with 178 degrees of freedom ($p<0.001$), a CFI of 0.918, an SRMR of 0.05 and an RMSEA of 0.048¹. With the exception of the

¹The error terms of two items were allowed to correlate, as they showed a high degree of overlap in their content. This significantly increased model fit, $\Delta\chi^2(1)=146.45$, $p<0.01$. The items were "I'm always able to satisfy patients' needs" and "I'm always able to offer my assistance to patients who are in trouble".

chi square statistic that is largely dependent on sample size (9), the goodness-of-fit indexes showed an acceptable model fit. The loadings were all high and significant, ranging from 0.53 to 0.72 (M=0.60, SD=0.05) at the individual level, and from 0.36 to 0.98 at the unit level (M=0.72; SD=0.12).

Job burnout

In the current study we used the two burnout dimensions of exhaustion and cynicism, from the Italian version of the Maslach Burnout Inventory-General Survey (MBI-GS, 51, 16). Items were framed as statements of job-related feelings, such as “I feel emotionally drained by my work,” and are rated on a 7-point frequency scale (ranging from 0=“never” to 6=“daily”). The two-factor model fitted the data: $\chi^2(68)=347.00, p<0.001, CFI=0.98, SRMR=0.039, RMSEA=0.067 (0.060-0.075)$. All the items had high loadings (>0.65) on the respective factor, with the exception of one item of the cynicism dimension, whose loading at the individual level was 0.20. The correlation of the two factors was 0.56 at the individual level, and 0.87 at the unit level. The internal consistency of the two subscales (Cronbach’s α) was 0.89 for exhaustion, and 0.78 for cynicism.

Statistical analyses

Multilevel Structural Equation Modeling (MSEM) was used to investigate the relationships between the variables, both at the individual and unit level. Analysis was performed using full maximum likelihood estimation in EQS (11). This approach differs from the traditional multilevel regression (i.e., Hierarchical Linear Modeling) in several ways. Whereas in multilevel regression,

group level characteristics are measured by aggregating individual level characteristics within groups, the MSEM permits the partitioning of the total variance into between- and within-group components (31). This approach is particularly suited to simultaneously investigating the differential relationships between variables at different levels of analysis. The same model can be simultaneously estimated both at unit and individual levels, highlighting similarities and differences of the underlying processes (38). The advantage of MSEM over multilevel regression is the possibility of handling measurement error and testing models with multiple dependent variables (instead of separate regression models for each outcome).

A significant amount of between-group variance is a prerequisite for performing a MSEM. Preliminary analyses, reported in table 1, were conducted to assess the intra-class correlation coefficient (ICC). The ICC provides an estimate of the relative distribution of between- and within-group variance, namely the proportion of the total variance of the study variables which is accounted for by clustering (53). Results revealed that the variances of the variables can be decomposed into variance at the group level and variance at the individual level, supporting the appropriateness of a multilevel analysis. Coefficients vary from low (0.08 self-efficacy and cynicism) to high (0.21, PoC-supervisor). On average, they can be considered as indexes of a moderate-to-high grouping effect (M=0.14; SD=0.05), according to the standards reported in the literature (e.g., 26, 33). The ICC values (all beyond the 0.05 cut off) attested that a significant proportion of variance of all the study variables can be attributable to unit differences.

Within the framework of MSEM, a structural model was performed. This model represents a multivariate regression, where perceptions of con-

Table 1 - Intraclass correlation coefficient (ICC) of study variables

	Exhaustion	Cynicism	PoC - nurses-physicians Teamwork	PoC - Hospital management	PoC - Nurse manager	PoC - Workload	Self -efficacy
ICC	0.108	0.082	0.151	0.126	0.213	0.202	0.078

Note. The ICC was calculated as the ratio of the variance between groups to the total variance

text were entered as predictors of exhaustion and cynicism, both at the individual and unit level. The variables were included in the model using the mean score of the constituent items for each construct. We handled measurement error by treating each measure as a latent factor with a single indicator, as suggested by Hayduk (29). This approach fixes the measurement error variance as the difference between 1 and the reliability of the composite scale times its variance (13). Cronbach's alphas were used as estimates of reliability (58). They were calculated either on individual- and unit-level data. This allowed us to take into account the unreliability of the measures at both levels. As age was found to be a correlate of burnout (18, 46), it was included at both levels as a control variable in the model.

RESULTS

Descriptive statistics

Multivariate analysis of variance was used to determine whether there were gender and educational differences in the study variables (i.e., exhaus-

tion, cynicism, self-efficacy beliefs, and PoC). No significant differences were found either between males and females ($F[7,969]=1.09, p=0.37$) nor across educational levels ($F[14,1884]=1.44, p=0.13$).

Table 2 presents the Cronbach's alpha and Pearson's correlation coefficients of study variables at the individual and group levels of analysis. At the individual level, both exhaustion and cynicism were negatively correlated with self-efficacy beliefs and with PoC scales for teamwork, supervisor, and management. Moreover, exhaustion was positively correlated with PoC-workload. At the unit level, both exhaustion and cynicism were negatively correlated with PoC-teamwork and management, while only exhaustion was positively correlated with PoC-workload. The PoC scales for teamwork, supervisor, and management were generally correlated with each other, as were the exhaustion and cynicism dimensions of burnout. All the scales showed acceptable levels of reliability, with the exception of PoC-workload at the individual level ($\alpha=0.57$), which showed a low reliability. However, this was not a concern because in the structural model we were taking into account measurement

Table 2 - Cronbach's alpha and Pearson correlations between the variables

	1	2	3	4	5	6	7	8
1. Exhaustion	0.89 (0.91)	0.84**	-0.53**	-0.39	-0.54**	-0.08	0.51**	-0.03
2. Cynicism	0.49**	0.78 (0.84)	-0.60*	-0.25	-0.46*	-0.23	-0.06	0.26
3. PoC - Nurses-physicians teamwork	-0.27**	-0.28**	0.78 (0.86)	0.43*	0.70**	0.43*	0.19	0.01
4. PoC - Hospital management	-0.27**	-0.15**	0.50**	0.90 (0.93)	0.51**	0.40*	0.08	-0.02
5. PoC - Nurse manager	-0.22**	-0.19**	0.58**	0.45**	0.83 (0.85)	0.27	0.16	-0.27
6. Self-efficacy	-0.27**	-0.32**	0.41**	0.23**	0.32**	0.90 (0.91)	-0.24	0.05
7. PoC- Workload	0.17**	0.05	0.04	-0.09*	0.07	0.15**	0.57 (0.74)	-0.42*
8. Age	0.04	0.07	0.04	-0.05	0.03	0.03	0.03	-

Note. * $p < 0.05$; ** $p < 0.01$. Correlations at the individual level ($N = 1,020$) are below the diagonal; correlations at the unit level ($N = 118$) are above diagonal. Cronbach's alpha are presented along the diagonal: coefficients without parentheses are based on individual-level data; coefficients in parentheses are based on unit-level data.

error of the scales (as described above). Below, results from the model are discussed separately for the within- and the between-unit levels.

MSEM at the Individual (within) level

At the individual level, exhaustion was negatively predicted by self-efficacy ($\beta=-0.24, p<0.001$), and PoC-management ($\beta=-0.15, p<0.01$), and positively predicted by PoC-workload ($\beta=0.21, p<0.01$). The effects of age, PoC-teamwork, and PoC-supervisor were not significant. Cynicism was negatively predicted by self-efficacy ($\beta=-0.29, p<0.001$) and PoC-Teamwork ($\beta=-0.20, p<0.01$), and positively explained by PoC-workload ($\beta=0.10, p<0.05$) and age ($\beta=0.10, p<0.05$). The effects of PoC-supervisor and PoC-management were not significant. The correlation between exhaustion and cynicism dimensions of burnout was positive and significant, after taking into account the effects

of the predictors. The individual level model explained 20% of the variance in exhaustion, and 17% of the variance in cynicism. The left side of figure 1 summarizes the results of the model at the within-group level.

MSEM at the Unit (between) level

At the unit level, exhaustion was highly and positively predicted by unit PoC-workload ($\beta=0.64, p<0.001$), while the other predictors were not significant. Cynicism was highly and negatively predicted by unit PoC-teamwork ($\beta=-0.51, p<0.01$). Exhaustion and cynicism were highly correlated to each other after the contribution made by PoC, self-efficacy and age had been taken into account. The unit level model explained 53% of the variance of exhaustion and 38% of the variance in cynicism between units. The right side of figure 1 summarizes the results of the model at the unit level.

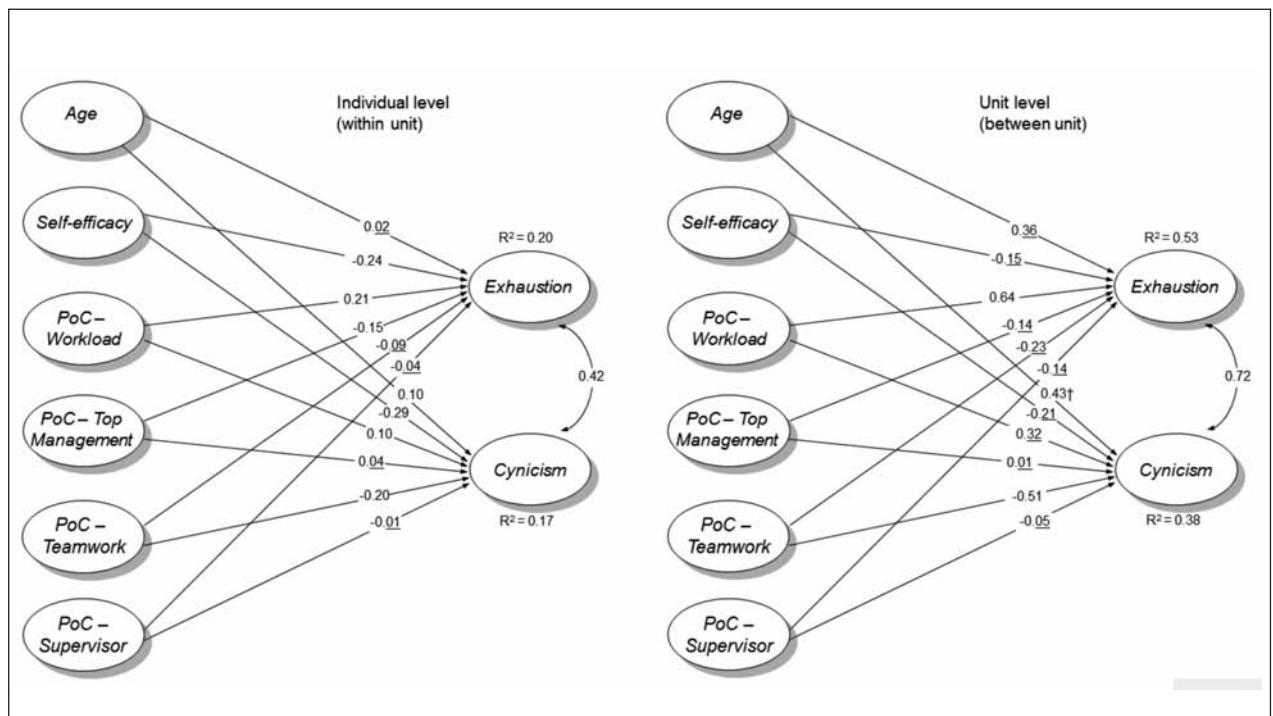


Figure 1 - The estimated model at the within (individual) and between (unit) levels. All parameters are standardized. Coefficients underlined are not statistically significant at the 0.05 alpha level. For sake of simplicity the correlations among predictors are omitted from the figure. † p < 0.10

DISCUSSION

First of all, our findings attested that our tailored measures of self-efficacy and PoC had good psychometric properties (validity and reliability) and the same factorial structure at both the individual and team levels of analysis. Secondly, our research attested that, at the individual level, exhaustion and cynicism may have both similar and divergent predictors. Specifically, the negative relationship between self-efficacy and both burnout dimensions corroborates previous findings (e.g. 19, 35, 50), and stresses the potential of this personal resource for both energetic and motivational components. Nurses who score high in self-efficacy are likely to believe in their ability to cope effectively with social and task constraints, are able to overcome frustrations and obstacles more rapidly, are less inclined to rumination, and thus are less exposed to energy depletion and to motivational erosion, in comparison to nurses low in self-efficacy. Consistent with previous findings (e.g. 41), nurses' exhaustion and cynicism were differently associated with the four perceptions of context. Workload, corroborating the extant research, was primarily related to exhaustion; however it showed also a significant relationship with cynicism. The perceived work overload seems to activate not only an energy depletion process, but also to have an effect in worsening the attitude towards work. With reference to the new dimension of perceptions of management, our results showed that this was related to exhaustion but not to cynicism. A possible explanation could be that, since the management is responsible for providing the staff with all the necessary resources (such as space, people, materials, and equipment) and for organizing the overall work process, a negative perception of management may push nurses to work more intensively, thus predicting their level of exhaustion. The perception of teamwork showed a distinct pattern of association with the two burnout dimensions: it was negatively associated with cynicism, but not with exhaustion. In other words, the level of cooperation among nurses and physicians probably predicted the motivational aspect of burnout, but not the energetic aspect. This result is consistent with findings that showed that the relationships be-

tween nurses and physicians, and their cooperation within the unit play a key role in nurses' well-being (32, 42). Surprisingly, the perception of the supervisor was less important in predicting either exhaustion or cynicism. Whereas the Pearson correlations with the two dimensions of burnout were significant, the relationship was reduced to zero after the effects of the other PoC had been taken into account. One last result at the individual level is that cynicism was partly and positively predicted also by age; that is, older nurses displayed higher cynicism. This finding is in contrast with some recent studies that showed a negative correlation between age and burnout (18), but may reflect certain aspects of the Italian hospital setting as a public organization. Because of a general lack of job opportunities, hospital employees are used to having to stay in their job, even in adverse conditions, rather than being able to quit.

The divergent pattern of relationships was even more evident at the unit level, where exhaustion and cynicism were associated with unique and distinct unit perceptions of context, namely perceptions of workload and perceptions of teamwork respectively. Units in which workload was perceived to be higher showed higher levels of exhaustion, whereas units in which the perception of collaboration between nurses and physicians was low showed higher levels of cynicism.

Finally, the comparison of patterns of relationships at the individual and unit level revealed some differences. Unsurprisingly, self-efficacy, being an individual characteristic, was related to burnout only at the individual level. However, it did not explain unit differences in burnout levels. Workload and teamwork showed similar patterns of relationships across levels, but with stronger magnitude at the unit level. The effect of Teamwork and Workload PoC seemed to be amplified at the team level, attesting the role of "shared perceptions" in explaining team differences in burnout. However, shared perceptions may have different interpretations. Whereas unit PoC-teamwork (referred to the shared perceptions of the level of cooperation between nurses and physicians in the unit) probably represents the result of the social interaction among members, unit PoC-workload (referred to

shared perceptions of the quantity of work that has to be accomplished in the unit) may reflect a more “objective” indicator of an environmental condition (after controlling for the individual differences due to subjective perceptions) which are also able to influence burnout levels (57, 19).

One advantage in measuring contextualized situational variables comes to light considering that the perception of teamwork, specifically referred to the cooperation among nurses and physicians within the unit, is a significant predictor of burnout at the individual and team level. This is not surprising, considering the increasing importance of the integration of divergent approaches (i.e. medical and nursing) in the unit (42), however this aspect is usually neglected in occupational stress models comprising a standardized set of measures (e.g. 37). Moreover, compared to other more general concepts, being contextualized and anchored to specific aspects or components, if a critical role of PoC emerges, this may provide useful information to identify specific intervention plans and actions.

All in all, the most important theoretical implication of the study was related to the multilevel approach adopted, that represents quite a novelty in burnout research. A multilevel approach, as compared to conventional analytical approaches, does not assume the independence of observations, thus it is more efficient in determining the significance of model parameters such as factor loadings or regression weights (54). Burnout research should incorporate group level effects, not only in order to obtain a more accurate estimate of individual effects, but also to distinguish between different processes that may occur at different levels within an organizational context. Such a multilevel perspective is still largely unexplored in burnout research. However, particularly in team-based organizations, like hospitals, in which team members are likely to share similar experiences and feelings, it may be able to enhance theoretical and empirical understanding of burnout (12)

Limitations and future research

There are three main limitations of the present study. The first is the cross-sectional nature of this

study, which precludes the demonstration of causal relationships. The current model provides a framework for systematically analyzing data, but it requires longitudinal research to manipulate one or more of the considered burnout correlates in order to reveal the presumed causal links. A second limitation of this study is the concern that results, particularly at the individual level of analysis, could be inflated by the common method variance, due to the fact that all measures were collected from a single source, self-reported data. However, it is worth noting that the constructs measured (perceptions of contextual dimensions, feelings of exhaustion and cynicism, self-beliefs) all represent, by definition, subjective aspects that only the person can report. On the other hand future research would benefit from including additional measures of environmental factors rated by other sources (e.g. objective measures or expert raters in the case of workload). An additional potential limitation is the low reliability of the of PoC-workload scale. Even if this did not represent a cause of concern because, as we took into account the measurement error by treating each measure as a latent factor with a single indicator, additional research should be devoted to strengthen this scale, also by including a higher number of items.

Moreover, as this research was conducted in a single hospital located in Italy, future research should explore these relationships in different organizations and cultural contexts, in order to explore how far the results can be generalized. At the same time the response rate of the study was not really high (58%), hence one should be cautious in generalizing the results to the whole hospital population. However, this response rate is higher than the average response rate in organizational studies (52.3%) reported in a recent meta-analysis (3). Given the role of self-efficacy at the individual level, and the fact that at the unit level self-efficacy does not seem to be related to burnout, future research should explore the role of collective efficacy at the unit level. Since nurses work interdependently in the unit, the shared beliefs of the ability of the group to achieve its collective goals could be an important dimension to explore in association with burnout.

Lastly, given the increasing relevance of hospital management in modern health care settings, and the significant relationship found between this dimension and exhaustion, it is recommended that future research explore further the contributions of management factors to the burnout process.

Implications for intervention

The current research has some implications for possible interventions in health care services. At the individual level, the more promising focus would be to enhance self-efficacy beliefs. Following Bandura's guidelines (6, 8), it would be important to develop interventions that promote an individual's resources of empowerment. Developing nurses' self-efficacy is possible through learned processes of coping, which enable people to master, tolerate, reduce or minimize existing stressors (25); and proactive coping, which enables people to "anticipate or detect potential stressors and act in advance to prevent them or to mute their impact" (4 p. 417). In this regard, the situations and behaviours identified through the critical incidents procedure in the focus groups could be useful to guide specific training in a protective setting by means of mastery and vicarious experiences.

In addition, it is clear that there is great value in looking at group level results, as well as individual ones, because the perceptions and feelings at the group level provide an important index of the hospital unit well-being. Hence a second set of burnout interventions could be based on the findings at the unit level, which provide information on sources of group burnout, and thus guidance on potential organizational interventions. Once a group has been identified as one at risk of cynicism, the intervention would be focused on improving the collaboration among nurses and physicians. In the case of high unit exhaustion, the intervention would focus on reducing the level of workload. Changes in unit work procedures or work shifts, better preparation and training of team members, and mutual training with physicians, are potential examples of organizational strategies to address these two critical factors at the unit level. Training may help to develop a common represen-

tation of patients and issues related to patient care, thus reducing the divergent approach of different professionals to such issues (42) and improving the quality of communication and integration within the unit. Moreover, the quality of relationships between nurses and physicians seems not only to be related to nurses' motivation, but also to patients' satisfaction (32).

This study, by considering simultaneously individual and group levels of burnout, aims to provide a clarification of the different roles played by self-beliefs and perceptions of work context, thus encouraging future multilevel research in hospital settings. Reducing burnout among nurses, in turn, can significantly contribute to the improvement of patients' quality of care.

NO POTENTIAL CONFLICT OF INTEREST RELEVANT TO THIS ARTICLE WAS REPORTED

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