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Burnout Syndrome Among Medical Residents in a Tertiary Hospital in Latin America: A Mixed-Methods Cross-Sectional Study of Structural and Cultural Determinants

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Abstract

Background

Burnout syndrome is a major concern in postgraduate medical training, particularly in hierarchical, high-demand clinical environments. Evidence from Latin American private teaching hospitals remains limited.

Objective

To determine the prevalence and associated factors of burnout among medical residents in a tertiary hospital in Ecuador and to explore residents' lived experiences through qualitative interviews.

Methods

A convergent mixed-methods design was used among 69 medical residents at a tertiary teaching hospital in Latin America. Burnout was assessed using the Maslach Burnout Inventory (MBI-HSS). Classic burnout was defined as high emotional exhaustion, high depersonalization, and low personal accomplishment. Multivariable logistic regression was used to explore associated factors. Additionally, semi-structured interviews were conducted with residents across specialties and training years to explore perceptions of training culture, workload, gender dynamics, and work–personal time balance. Qualitative data were analyzed using thematic analysis.

Results

The prevalence of classic burnout was 37.7%. High EE was observed in 60.9%, high DP in 47.8%, and low RP in 65.2%. No statistically significant associations were found between burnout and age, sex, marital status, or specialty after adjustment. Qualitative findings identified first-year residency as a critical vulnerability period and highlighted hierarchical culture, workload intensity, and perceived misalignment between institutional expectations and lived training experience as central stressors.

Conclusions

Burnout among residents in this setting reflects structural and cultural dimensions of medical training rather than individual sociodemographic characteristics. Institutional interventions targeting formative culture and workload organization are warranted.

INTRODUCTION

Burnout syndrome has emerged as a major concern in postgraduate medical training worldwide. Characterized by emotional exhaustion, depersonalization, and reduced personal accomplishment, burnout is associated with decreased quality of care, medical errors, impaired professional satisfaction, and long-term mental health consequences(1). Residents represent a particularly vulnerable population due to prolonged working hours, high clinical responsibility, hierarchical training structures, and limited autonomy(2, 3).

Global estimates of burnout among physicians vary widely. In the United States, approximately 40% of physicians report at least one symptom of burnout(4), while nearly one-third of physicians in training in the United Kingdom report high levels of burnout(5). A systematic review including low- and middle-income countries found prevalence rates ranging from 2.5% to 87.9%, reflecting substantial methodological and contextual heterogeneity. Regional meta-analyses suggest that burnout patterns may differ across continents, with variations in depersonalization and personal accomplishment dimensions.

In Latin America, emerging evidence indicates significant levels of burnout across specialties. Studies in rheumatologists and orthopedic surgeons have reported high rates of emotional exhaustion and depersonalization(6–8). In Ecuador, previous research among healthcare professionals has demonstrated a notable prevalence of burnout and associations with psychological traits and illegitimate task burden(9, 10). However, data specifically addressing residents in private tertiary teaching hospitals remains limited.

Furthermore, most studies rely exclusively on quantitative instruments, providing limited insight into the cultural and structural dynamics underlying burnout during residency training. The integration of qualitative perspectives may offer a deeper understanding of institutional factors, hierarchical culture, and work–life imbalance that are not fully captured by standardized scales.

The present study aimed to determine the prevalence of burnout among medical residents at a tertiary teaching hospital in Ecuador and to evaluate sociodemographic factors associated with it. Additionally, a qualitative component was incorporated to explore residents' lived experiences and contextualize quantitative findings.

MATERIALS AND METHODS

Study Design and Setting

A convergent mixed-methods cross-sectional study was conducted among medical residents at a tertiary-level teaching hospital in Latin America. The quantitative component assessed the prevalence of burnout and associated factors, while the qualitative component explored residents' perceptions of training culture and psychosocial vulnerability. The mixed-methods design was chosen to complement prevalence estimates with contextual understanding of structural and cultural determinants within residency training. Data collection was performed during a single academic cycle, and participation was

voluntary and anonymous. Quantitative and qualitative findings were integrated during the interpretation phase to provide a comprehensive understanding of burnout determinants.

Participants

All residents enrolled in the hospital's postgraduate medical training programs were eligible to participate. Inclusion criteria consisted of active enrollment in residency at the time of data collection. Residents on prolonged leave were excluded.

A total of 69 residents completed the survey and were included in the quantitative analysis. For the qualitative component, semi-structured interviews were conducted with selected residents from different years of training and specialties to ensure representation across training stages.

Quantitative Component

Burnout Assessment

Burnout was measured using the Maslach Burnout Inventory – Human Services Survey (MBI-HSS), a validated 22-item instrument assessing three dimensions: 1) Emotional Exhaustion (EE), 2) Depersonalization (DP), and 3) Personal Accomplishment (PA).

Subscale scores were categorized according to established cut-off points:

- Emotional Exhaustion: low ≤ 18, moderate 19–26, high ≥ 27.
- Depersonalization: low ≤ 5, moderate 6–9, high ≥ 10.
- Personal Accomplishment: low ≤ 33, moderate 34–39, high ≥ 40.

Higher EE and DP scores indicate greater burnout severity, whereas lower PA scores indicate greater burnout.

The use of the Maslach Burnout Inventory – Human Services Survey (MBI-HSS) was authorized through a license obtained from Mind Garden, Inc.

Definition of Burnout

The primary outcome was classic burnout, defined as the simultaneous presence of 1) High Emotional Exhaustion, 2) High Depersonalization, 3) Low Personal Accomplishment.

Secondary analyses explored individual MBI dimensions across sociodemographic and training variables, including age (continuous), sex (male/female), marital status (single vs. married/other), year of residency (R1–R4), and specialty

Qualitative Component

Semi-structured interviews were conducted by a trained psychiatrist experienced in qualitative research with residents from different specialties and years of training. Interviews explored: 1) Perceived vulnerability during residency, 2) Gender-related experiences, 3) Changes in self-perception before and during residency, 4) Perceptions of institutional culture. Interviews were transcribed and analyzed using thematic analysis. Coding was performed iteratively using an inductive approach to identify recurrent themes related to hierarchy, workload, emotional strain, and gender dynamics. The semi-structured interview guide was developed specifically for this study and is provided as Supplementary File 2.

Statistical Analysis

Quantitative data were analyzed using Stata (version 19). Descriptive statistics were calculated for sociodemographic variables and MBI dimensions. Continuous variables are presented as means and standard deviations; categorical variables are presented as frequencies and percentages.

Logistic regression models were constructed to evaluate factors associated with classic burnout. Adjusted odds ratios (ORs) with 95% confidence intervals (CIs) were reported. Internal Medicine was used as the reference category for specialty comparisons. Statistical significance was defined as $p < 0.05$. Model assumptions were assessed prior to analysis.

RESULTS

Burnout Syndrome by Medical Specialty

Sample Characteristics

Sixty-nine residents belonging to six medical specialties were included: Internal Medicine (23.2%), Gynecology and Obstetrics (17.4%), Pediatrics (18.8%), General Surgery (14.5%), Traumatology (14.5%), and Radiology (11.6%).

The distribution by sex and marital status was homogeneous across specialties. The mean age showed no relevant differences in the comparative analyses.

Prevalence of Burnout

The prevalence of classic burnout, defined as the simultaneous presence of: 1) High emotional exhaustion, 2) High depersonalization, 3) Low personal accomplishment, was 37.7% (26/69).

When analyzing the dimensions separately, 60.9% presented high emotional exhaustion. 47.8% presented high depersonalization. 65.2% presented low personal accomplishment.

These findings highlight a high frequency of career burnout in the studied population, particularly in the dimensions of emotional exhaustion and decreased personal accomplishment.

Analysis by Specialty

Variability in burnout prevalence was observed across specialties. In the multivariate analysis, taking Internal Medicine as the reference category, no statistically significant differences were identified after adjustment for age, sex, and marital status.

However, trends in the direction of the effect were evident, particularly lower odds of burnout in Radiology and higher odds in General Surgery, although they did not reach statistical significance.

Multivariate Analysis

In the logistic regression model adjusted for age, sex, marital status, and specialty, no significant association was found between classical burnout and age. No significant association was found with sex. No significant association was found with marital status.

The overall model did not reach statistical significance ($p > 0.05$), likely influenced by the sample size and the number of categories analyzed.

Table 1
Sociodemographic and Training Characteristics (N = 69)

Variable	**n (%) or Mean ± SD**
Age (years)	30.7 ± 2.6
Female sex	38 (55.1%)
Married/Other	7 (10.1%)
Year of Residency	
R1	11 (15.9%)
R2	18 (26.1%)
R3	22 (31.9%)
R4	18 (26.1%)
Specialty	
Internal Medicine	16 (23.2%)
Pediatrics	13 (18.8%)
Gynecology & Obstetrics	12 (17.4%)
General Surgery	10 (14.5%)
Traumatology	10 (14.5%)
Radiology	8 (11.6%)

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A total of 69 medical residents were included in the quantitative analysis. The mean age was 30.7 years (SD 2.6; range 26–39). Women represented 55.1% (n = 38) of participants. Most residents were single (89.9%, n = 62).

Residents were distributed across training years as follows: R1 (15.9%), R2 (26.1%), R3 (31.9%), and R4 (26.1%). The most represented specialty was Internal Medicine (23.2%), followed by Pediatrics (18.8%), Gynecology and Obstetrics (17.4%), General Surgery (14.5%), Traumatology (14.5%), and Radiology (11.6%).

Table 2
Distribution of Burnout Dimensions

Burnout Dimension	**n (%)**
High Emotional Exhaustion	42 (60.9%)
High Depersonalization	33 (47.8%)
Low Personal Accomplishment	45 (65.2%)
Classic Burnout	26 (37.7%)

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High emotional exhaustion (EE) was present in 60.9% of residents (n = 42), while high depersonalization (DP) was observed in 47.8% (n = 33). Low personal accomplishment (PA) was identified in 65.2% (n = 45).

Using the predefined definition of classic burnout (high EE + high DP + low PA), the overall prevalence was 37.7% (n = 26).

Table 3

Multivariable Logistic Regression for Classic Burnout *Reference specialty: Internal Medicine*

Variable	Adjusted OR	95% CI	p-value
Age	0.88	0.68–1.14	0.34
Female sex	1.08	0.29–4.08	0.91
Married/Other	1.56	0.21–11.54	0.67
General Surgery	3.49	0.51–23.81	0.20
Gynecology & Obstetrics	0.53	0.09–3.02	0.48
Radiology	0.25	0.02–2.92	0.27
Pediatrics	2.05	0.40–10.60	0.39
Traumatology	0.48	0.06–4.18	0.51
R1 (vs R2–R4)	0.40	0.07–2.18	0.29
Model fit: LR $\chi^2(9) = 12.09$; $p = 0.208$; Pseudo $R^2 = 0.132$			

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Descriptive analysis showed variability in burnout prevalence across specialties; however, no statistically significant differences were observed in adjusted analyses.

Multivariable logistic regression adjusted for age, sex, marital status, specialty, and year of residency did not demonstrate statistically significant associations between sociodemographic variables and classic burnout.

Using Internal Medicine as the reference category, none of the specialties showed significantly different odds of burnout. Although higher odds were observed in General Surgery (OR 3.49; 95% CI 0.51–23.81) and Pediatrics (OR 2.05; 95% CI 0.40–10.60), confidence intervals were wide and crossed unity.

Age, sex, marital status, and first-year residency (R1) status were not independently associated with burnout.

The overall model did not reach statistical significance (LR $\chi^2 = 12.09$; $p = 0.208$).

Reason for choosing a specialty

Most residents referred to having chosen their specialty by early vocational and reaffirmation during medical training. Personal preference predominated over economic or job factors. Only one case mentioned circumstantial admission to the specialty.

Meaningful vocational misalignment was not identified as a primary driver of disengagement.

Perception of the specialty

An ambivalent perception prevailed, proud to belong to the program, high demand recognition, positive valuation of hospital infrastructure, and marked frustration in surgical specialties due to low practical exposure.

Clear differentiation between services was observed, with environments described as respectful and formative (Imaging, Gynecology), hierarchical and rigid (Surgery, Traumatology) and demanding and emotionally intense (Internal Medicine, Pediatrics).

Definition of burnout

Most associate burnout with physical fatigue, mental exhaustion, and work overload. Fewer participants included emotional affect, impact on personal relationships, and decreased performance. This suggests a predominantly fatigue-focused conceptualization, rather than a multi-dimensional syndrome.

Self-perception of burnout

There is consensus that the R1 period is the most vulnerable, and that the transition to R2 partially reduces wear. Surgically, wear may be maintained or increased by technical frustration. Many residents normalize burnout as an inherent part of residency. This is relevant: the normalization of suffering appears as a cultural phenomenon.

Dimensions of the MBI in Qualitative Discourse

Among junior residents, we can see irritability, frequent crying, isolation, and a sense of constant saturation.

Among senior residents, on the other hand, cumulative fatigue is most evident, along with emotional fluctuation, better relative regulation, depersonalization, irritability toward the close environment, conscious effort not to affect relationships with patients, recognition of a partial loss of empathy in overload contexts, personal accomplishment, despite the wear, a sense of professional pride, vocational reaffirmation, and a sense of accomplishment. These dialogues align with the quantitative findings of high personal accomplishment in a proportion that is relevant.

Self-perception prior to postgraduate

This axis is psychologically potent. Three narrative profiles emerge: 1) High-Performance-Based Identity (“I was always a good student.”, “I’ve been responsible all my life.”). In these cases, residency training represents a breakdown of the self-efficacy schema.

When they fail or are questioned, the impact is on identity.

Their prior independent identity relies on an autonomous life, exercise, personal time, and economic independence. Residency involves an abrupt loss of control over life.

Some describe strong character, prior adaptation, and experience in public hospitals. In these cases, burnout seems more contained.

Residency training depends largely on the contrast between prior identity and current experience. The greater the discrepancy between the “competent prior self” and the “resident questioned self,” the greater the emotional impact.

Perception of graduate school per se

Here, a very clear ambivalent structure emerges, with a positive dimension that includes institutional prestige, infrastructure, prioritizing patients, and pride of belonging. On the other hand, the negative dimension involves a hierarchical culture, punitive error handling, cumulative academic demands, surgical frustration, and the actual extent of guards.

In surgery, especially: “The hospital says he’s a teacher, but he’s zero teachers in practice.” Here, a structural conflict between institutional discourse and lived experience emerges.

The perception of postgraduates is not homogeneous; it depends on specialty, supervisory style, year of residency, and individual expectations.

It is evident that burnout does not emerge solely from the hourly burden but from dissonance between formative expectations and structural reality.

Presence of psychiatric comorbidities

They reported generalized anxiety, depression, sleep disorders, use of psychotherapy, and SSRI treatment. These qualitative findings reinforce the clinical relevance of the phenomenon under study.

Disruption of Work–Personal Time Boundaries

A recurrent theme across interviews was the perceived erosion of boundaries between professional and personal life. Residents described prolonged shifts, unpredictable schedules, and limited opportunities for restorative time outside the hospital.

Participants frequently referred to difficulty maintaining social relationships, personal routines, and sleep hygiene. Several described the impossibility of planning non-medical activities due to schedule volatility. Time off was often experienced as recovery rather than leisure.

Importantly, this disruption was not framed solely as workload intensity, but as temporal unpredictability and lack of protected personal time. Residents in higher-demand specialties emphasized cumulative fatigue over consecutive rotations.

This qualitative finding aligns with the elevated prevalence of emotional exhaustion observed quantitatively (60.9%) and supports the interpretation that structural scheduling patterns may contribute to burnout dimensions across specialties.

Protective factors

They consistently emerge as the main buffer, along with fellowship, family networks, psychotherapy, physical exercise, vacations, empathic supervisors, positive feedback, and horizontal support between residents.

Triggering factors

The main issues recognized are work overload, prolonged shifts, sleep deprivation, rigid hierarchies, public humiliation, a punitive culture around errors, and a lack of surgical development in operating services. It is particularly relevant that episodes of overt verbal maltreatment were documented. These findings highlight the potential institutional impact of verbal mistreatment during training.

Susceptibility by year of residency

Here, a clear and consistent pattern emerges. The R1 (Minor Residents) feature an initial sense of incompetence, intense exposure to hierarchy, public humiliation in some cases, extreme schedule overload, and marked emotional vulnerability (“Feel like you don’t know anything”, “Everything you do is wrong”), reflecting a professional identity crisis.

The first year appears to be a critical period of the professional self's destructuring and reconstruction.

By contrast, R majors show greater autonomy, improved emotional regulation, and persistent cumulative fatigue. In surgery, this is especially due to technical limitations. It is no longer identity disruption, but protracted structural tension.

The year of residency not only modifies the workload but also the symbolic position within the hierarchy. The R1 faces vulnerability, constant assessment, and dependence. The R major faces accountability, expectations, and performance pressure. They are different forms of wear.

Susceptibility by gender

The gender-focused analysis revealed no clear differences in how burnout is conceptualized between men and women; however, nuances emerged in its experience and narration.

Female residents tended to describe burnout in explicit emotional terms (sadness, crying, irritability) and to refer more frequently to its impact on interpersonal relationships and to psychological support seeking. They also reported episodes of public humiliation and professional questioning that affected their self-perception.

By contrast, male residents described burnout in more operational and structural terms (technical frustration, hierarchical pressure, workload). In surgical specialties, a narrative of vulnerability associated with public exposure in the operating room, fear of error, and a vertical culture of authority was observed.

In both groups, the normalization of burnout was evident as an inherent part of the formative process.

In general surgery, a particular narrative emerged among some male residents, who described an experience of heightened hierarchical severity and evaluative demand. Some also noted a perception that female residents might receive differential treatment or greater tolerance in certain training contexts.

These perceptions reflect tensions associated with traditional models of surgical authority and differing expectations of professional performance. However, this analysis did not allow objective confirmation of structural differences in workload or assessment by gender, but rather highlighted subjective constructions of legitimacy and demandingness within the surgical culture.

DISCUSSION

The present study demonstrates a substantial prevalence of burnout among medical residents in a tertiary teaching hospital, with 37.7% meeting criteria for classic burnout and particularly high proportions of emotional exhaustion (60.9%) and reduced personal accomplishment (65.2%). These findings align with international literature reporting elevated burnout rates in postgraduate medical training and reinforce ongoing concerns regarding occupational distress within hierarchical, high-demand clinical environments(9–11).

To facilitate the integration of quantitative and qualitative findings, we developed a conceptual framework illustrating the structural and cultural determinants of burnout identified in this study (Fig. 1).

Contrary to some prior studies, multivariable analysis did not reveal statistically significant associations between burnout and age, sex, marital status, specialty, or year of residency. Although directional trends were observed across certain specialties, confidence intervals were wide and the overall model did not reach statistical significance. These results suggest that burnout in this setting may not be sufficiently explained by individual sociodemographic characteristics alone, pointing instead toward structural and institutional determinants.

The qualitative component provides essential contextual insight into this absence of strong quantitative predictors. Across interviews, residents described a training environment characterized by sustained workload intensity, rigid hierarchical structures, and normalization of exhaustion as an implicit component of professional formation. Rather than identifying discrete demographic risk groups, participants emphasized institutional culture as central to their experience of distress.

A recurrent theme was the internalization of emotional and physical fatigue as an expected stage of medical training. This normalization may contribute to under recognition and underreporting of

symptoms, reinforcing burnout as a structural phenomenon embedded within formative culture rather than as an individual vulnerability(12). The disruption of work–personal time boundaries further emerged as a prominent stressor, with residents describing schedule unpredictability and limited protected personal time as cumulative contributors to exhaustion. These qualitative findings are consistent with the high prevalence of emotional exhaustion observed quantitatively.

Hierarchical dynamics and public evaluative exposure—particularly in procedural and surgical specialties—were described as salient stressors. However, these experiences were not confined to a single specialty and were reported to varying degrees across training programs, supporting the quantitative observation that burnout was broadly distributed within the institution(11, 13).

Although first-year residency was frequently described as emotionally demanding in narrative accounts, it did not emerge as an independent predictor in regression modeling(14). This discrepancy underscores the value of a mixed-methods approach: qualitative narratives may capture transitional or context-specific vulnerabilities that are not fully detectable in cross-sectional statistical models.

From a gender perspective, the findings suggest that burnout is not distributed solely according to demographic categories but is mediated by sociocultural dynamics within specialty-specific training models(13, 15). While women tended to articulate the emotional impact of strain more explicitly, male residents—particularly in surgical contexts—described vulnerability linked to performance pressure, public technical evaluation, and accountability within rigid hierarchical environments. Importantly, quantitative analysis did not demonstrate statistically significant gender-based differences in burnout prevalence, indicating that gender may influence the subjective framing and expression of distress rather than its overall occurrence.

In surgical environments characterized by high visibility of error and strong vertical structures, some male residents reported tension between traditional ideals of professional resilience and the lived experience of uncertainty inherent to technical training(16). Perceptions that women receive greater protection may reflect complex interactions involving paternalism, implicit bias, and differentiated expectations rather than straightforward structural advantage. These findings suggest that gender operates not merely as a demographic variable but as a sociocultural construct that shapes how vulnerability is legitimized, expressed, and managed within medical training contexts.

Despite significant levels of emotional exhaustion, many residents maintained a strong sense of vocational identity and professional commitment(17). This indicates that burnout in this setting does not necessarily entail professional disengagement but rather reflects tension between institutional demands and available personal and structural resources. The identification of protective factors—including peer support, family support, and access to psychotherapy—highlights potential leverage points for institutional intervention aimed at strengthening resilience without normalizing structural overload(18).

Taken together, the integration of quantitative and qualitative findings supports the interpretation of burnout as a multidimensional phenomenon embedded within the structural and cultural architecture of

residency training, rather than as a condition primarily attributable to individual demographic characteristics. These findings reinforce the need to move beyond individual-centered frameworks toward system-level approaches in addressing burnout within medical training environments. As illustrated in Fig. 1, burnout emerges from the interaction between structural conditions, training experiences, and moderating factors that shape residents' vulnerability to distress.

Strengths and Limitations

This mixed-methods design enabled the integration of standardized measurement with contextual interpretation. The inclusion of multiple specialties provided comparative insights across training environments.

However, the single-center design and the modest sample size may have limited statistical power to detect smaller associations and generalizability. The cross-sectional design precludes causal inference. Self-reported measures may introduce reporting bias.

CONCLUSION

Burnout among medical residents in this tertiary hospital reflects structural and cultural dimensions of medical training rather than individual sociodemographic vulnerability. Interventions targeting hierarchical dynamics, workload organization, and early-year transition support may be critical for mitigating occupational distress. Future multicenter longitudinal studies are needed to clarify causal pathways and inform systemic reform in postgraduate medical education.

Declarations

Data Availability Statement

Due to the nature of this study, the data contains sensitive patient information and cannot be made publicly available to protect patient confidentiality. However, specific data or insights can be shared upon reasonable request, provided appropriate ethical approval is in place. Requests for access to the data should be directed to the corresponding author.

Author Contributions

DMV conceived and designed the study, coordinated data collection, interpreted the data, and drafted the manuscript. HOJP contributed to study design, performed statistical analysis, and critically revised the manuscript. AFMN contributed to data collection, data curation, and manuscript revision. ACCC contributed to qualitative data analysis, interpretation of findings, and manuscript revision. DASC contributed to data collection, literature review, and manuscript editing. ALMP contributed to literature review, conceptual development, and critical revision of the manuscript. CXVV contributed to study

supervision, methodological guidance, and critical revision of the manuscript. All authors read and approved the final manuscript.

Consent for publication

Not applicable.

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Competing interests

The authors declare that they have no competing interests.

Ethical Considerations

This study was reviewed and approved by the Ethics Committee for Research in Human Beings of the Universidad Técnica de Manabí (CEISH-UTM), Ecuador (approval code: CEISH-UTM-EXT_26-03-27_DVMV). All participants provided informed consent prior to participation. All methods were carried out in accordance with relevant guidelines and regulations, including the Declaration of Helsinki. Patient confidentiality was rigorously protected through data anonymization, and all procedures conformed to the applicable ethical and legal regulations for research in Ecuador.

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Figures

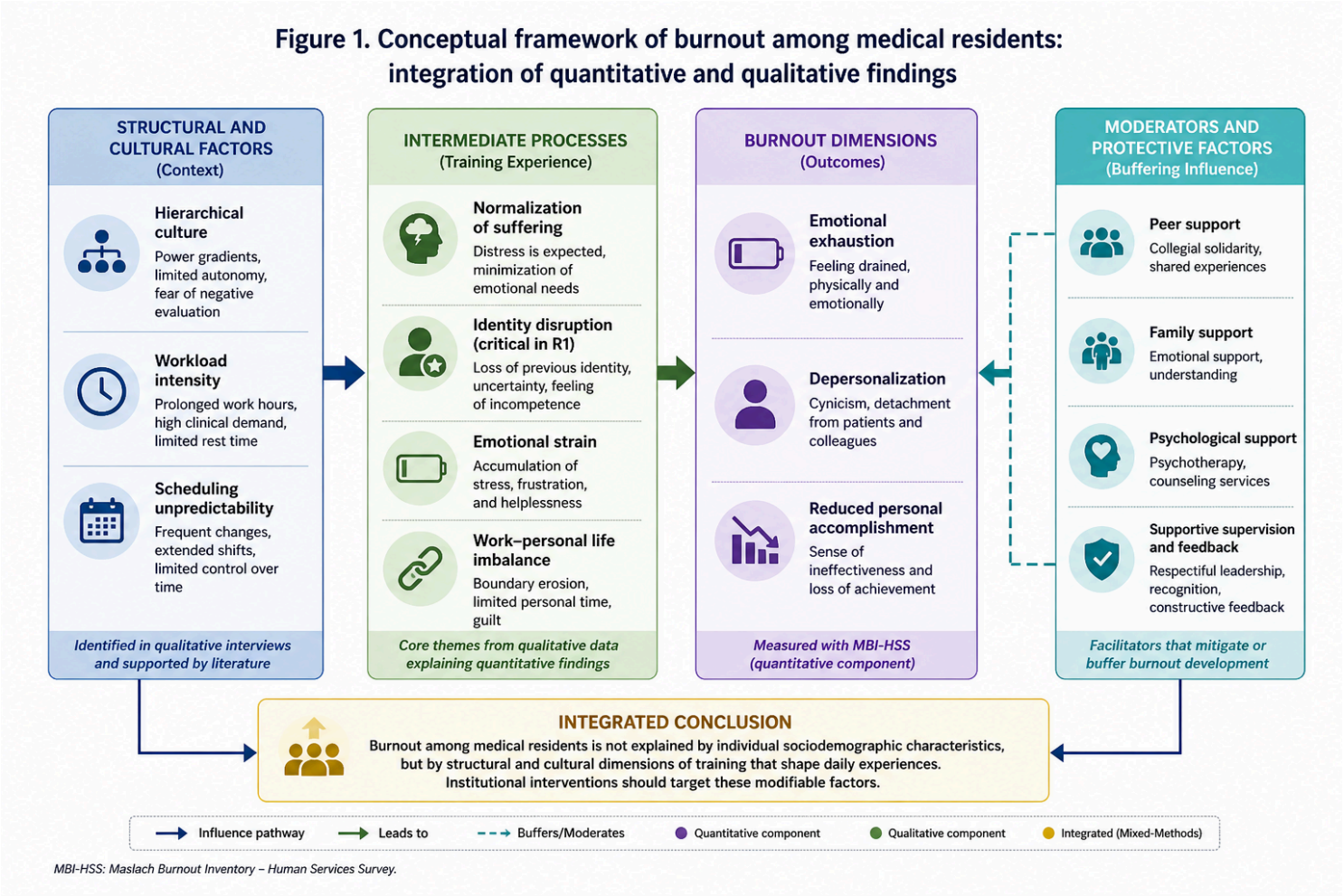


Figure 1

Conceptual framework of burnout among medical residents: integration of quantitative and qualitative findings. The figure illustrates the structural and cultural factors, intermediate processes, and burnout dimensions identified in this study, as well as moderating protective factors. The framework integrates quantitative and qualitative findings derived from the present mixed-methods study.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- SupplementaryFile1.docx
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