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Quality of Life, Burnout and Well-Being Among Neurology Residents in French-Speaking Belgium: Protocol for a Cross-Sectional Mixed-Methods Study.

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Method Article

Keywords: Burnout, Quality of Life, Neurology, Internship and Residency, Brain Health Mission

Posted Date: August 14th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-10690917/v1

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Additional Declarations: The authors declare no competing interests.

Abstract

Background: Burnout among medical trainees is highly prevalent, with neurology residents exposed to specific risk factors related to workload, emotional demands, and work-life imbalance. Growing attention to physician well-being, including through the European Academy of Neurology's Brain Health Mission, underscores the need for systematic data on resident wellness.

Objective: This study aims to evaluate burnout, work-life balance, fatigue, quality of life, and professional satisfaction among all neurology residents in French-speaking Belgium. A mixed methods design will be used to characterize well-being and inform institutional interventions.

Methods: We will conduct a multicentre cross-sectional online survey of all neurology residents in French-speaking Belgium. Validated scales will assess burnout (MBI-HSS (MP)), work-home interaction (SWING), daytime sleepiness (ESS), and global quality of life (WHOQOL-BREF). Additional items will measure job satisfaction, workload, and professional context. Open-ended questions will provide qualitative insights. Quantitative data will undergo descriptive and correlational analysis; qualitative data will be thematically analysed.

Expected results: The study will provide a multidimensional overview of neurology residents' well-being and identify risk and protective factors associated with burnout, quality of life, and training conditions.

Conclusion: This protocol outlines the first systematic evaluation of well-being among neurology resident in French-speaking Belgium. Findings will support evidence-based strategies to promote brain health among clinicians in training.

Ethics and dissemination: Ethical approval will be obtained from the relevant institutional review board at Cliniques Universitaires Saint-Luc, Brussels, Belgium, and electronic informed consent will be required. Findings will be disseminated through peer-reviewed publication, conference presentations and communication to neurology training programs.

Trial registration:

The study will be registered on OSF Registries prior to data collection. Protocol and SAP will be publicly accessible upon publication. De-identified participant data, study instruments and statistical code will be deposited in OSF and made available upon reasonable request after publication.

Article Summary

- This study provides the first comprehensive assessment of burnout, quality of live, work-life balance and fatigue among neurology residents in French-speaking Belgium.
- A mixed-methods approach combining validated psychometric instruments and qualitative feedback will offer a multidimensional understanding of resident well-being.

- The survey will include established tools such as the MBI-HSS(MP), WHOQOL-BREF, SWING questionnaire and Epworth Sleepiness Scale, enabling comparison with international literature.
- Findings are expected to identify key risk and protective factors that can inform institutional strategies to support trainee well-being and improve neurology training environments.
- As this is an anonymous, cross-sectional survey, no intervention or clinical risk is involved; results will be disseminated to training programs, resident organizations and the scientific community.

Introduction

Burnout among physicians in training is highly prevalent, reaching what some have called “epidemic” levels in recent years[1]. Meta-analyses indicate that, on average, roughly one-third to one-half of medical residents experience burnout symptoms[1]. In neurology, a specialty often cited for intense workloads and emotional demands, burnout rates are particularly concerning. Survey-based studies suggest that between over half and three-quarters of neurology trainees meet established burnout criteria[2,3]. For example, a 2016 national survey found that 73.5% of U.S. neurology residents exhibited at least one symptom of burnout[2], and a recent European study similarly noted that about 74% of neurology residents and junior neurologists fell into a dysfunctional burnout profile (with 22.6% classified in full burnout)[3]. These figures underscore that physician burnout is not limited to practicing doctors but already impacts those in training.

Multiple factors associated with residency training have been implicated in the development of burnout. Work-life imbalance is a prominent contributor: only about one in five neurology residents felt their schedule left sufficient time for personal or family life according to one study[2]. Long working hours and frequent on-call duties are strongly correlated with burnout risk[4]. Residents who work more than 80 hours per week have been shown to have markedly higher odds of experiencing exhaustion and disengagement than those with more moderate workloads[4]. Similarly, an increased frequency of night shifts has been identified as an independent risk factor for burnout among European neurology trainees[3]. High levels of fatigue and daytime sleepiness often accompany these demanding schedules, potentially exacerbating emotional exhaustion. Low job satisfaction and perceived lack of support or meaning at work are additional important predictors of burnout in medical trainees[3]. Conversely, protective factors such as a supportive work environment, schedule autonomy, and opportunities for recovery can mitigate burnout risk[3]. These insights highlight the multifactorial nature of burnout, with personal, situational, and organizational elements all playing a role.

The consequences of physician burnout are far-reaching, affecting not only the individuals experiencing it but also their patients and training institutions. Clinically, burnout has been linked to increased rates of medical error and compromised patient safety[1]. Even modest increases in residents’ burnout scores correspond to significantly higher likelihood of self-reported errors – for instance, each 1-point rise in depersonalization is associated with an 11% greater risk of medical errors[1]. Burnout also contributes to

a decline in quality of care via reduced empathy, impaired professionalism, and more terse communication with patients[1]. At the individual level, residents suffering from burnout are more prone to depression, substance use, and dropout from training. At an institutional level, burnout leads to higher staff turnover and staffing shortages. The cost of replacing a physician has been estimated at up to 2–3 times the physician's annual salary[1], representing a serious burden for healthcare systems. Thus, failing to address trainee well-being can result in both human and financial costs for healthcare organizations.

The European Academy of Neurology (EAN) has incorporated physician wellness into its strategic agenda (e.g. the "Brain Health Mission"), highlighting that the brain health of clinicians is integral to patient brain health[5]. In French-speaking Belgium, neurology residents recently formed Hoffmann – the first association dedicated to neurology trainees' interests – in part to facilitate peer support and advocacy[6]. Such developments reflect a broader cultural shift: healthcare institutions and policymakers are acknowledging that investing in the well-being of physicians-in-training is crucial for sustaining the workforce and maintaining high-quality patient care. Within this context, the present study will rigorously assess key dimensions of well-being in neurology residents, with the goal of informing interventions to prevent burnout and improve quality of life during specialty training. By providing data on the local situation in francophone Belgium, the project aims to contribute to the wider European conversation on physician wellness in neurology training and to propose evidence-based strategies for improvement.

Methods and Analysis

Study Design:

This will be a multicentre, cross-sectional, anonymous online survey involving all neurology residents in the French-speaking regions of Belgium. Participation will be voluntary following informed consent. Protocol version 1.0 – December 2025.

Study Population and Recruitment:

All residents enrolled in accredited neurology training programs in French-speaking universities will be eligible (~ N = 75). Recruitment will be conducted via institutional mailing lists and the Hoffmann residents' society. Only participants who complete > 80% items will be included. Missing data will be handled via pairwise deletion. No imputation is planned.

Survey Structure:

The online questionnaire consists of validated psychometric scales, structured questions evaluating work context and satisfaction and an optional qualitative section.

Data Management:

Data will be collected via Qualtrics, exported in CSV format, stored on secure institutional servers, with access restricted to investigators. No personal identifiers will be collected.

Quantitative Measures:

Burnout will be measured using the Maslach Burnout Inventory – Human Services Survey for Medical Personnel (MBI-HSS (MP)), a validated instrument specifically designed for healthcare professionals[7]. The MBI-HSS (MP) consists of 22 items evaluating the three core dimensions of burnout: emotional exhaustion, depersonalization (cynicism) and reduced personal accomplishment. It is the most widely used tool for assessing occupational burnout and has demonstrated strong validity and reliability across diverse medical contexts[1,4,7]. Scoring will follow standard guidelines and thresholds for high burnout will be defined in accordance with published criteria[7]. The use of the MBI-HSS (MP) in this study ensures comparability of our findings with the international literature on resident burnout.

Professional satisfaction will be evaluated with a dedicated questionnaire on job satisfaction, developed for this study based on existing surveys of physician well-being. Participants will be asked about their level of contentment with various aspects of their work, including working conditions, workload, educational supervision, team atmosphere, career prospects and recognition received. These items are intended to gauge overall job satisfaction and to identify specific areas of discontent. While a single standardized scale for physician job satisfaction will not be used, the questionnaire content is informed by prior research on factors affecting residents' satisfaction and engagement[3]. The responses will provide a profile of how neurology trainees perceive their work environment and may reveal correlations between low satisfaction in certain domains and higher burnout scores.

Work-life balance will be assessed through a combination of objective workload indicators and subjective evaluation. The survey will capture key metrics such as average weekly working hours, the frequency of overnight or weekend on-call duties, schedule flexibility and the ability to disconnect from work during off-time. Using these inputs, we will calculate a composite work-life balance index reflecting the respondent's work-home integration. This index will synthesize factors like time commitment and rest opportunities to quantify the balance or imbalance between professional and personal life for each resident. In addition, participants will rate their agreement with statements regarding work-family conflict and overall satisfaction with their work-life integration (e.g. "My work schedule leaves me enough time for family or personal activities"). These self-reported perceptions provide important context beyond the raw workload numbers[2]. We anticipate that high workload will correlate with poorer work-life balance scores, consistent with evidence that excessive hours significantly increase burnout risk[4]. To enrich this section, we will incorporate a validated instrument for work-home interaction, the Survey Work-Home Interaction Nijmegen (SWING) questionnaire, a 22-item scale that assesses positive and negative spillover between work and home domains. A French version of the SWING has been validated, demonstrating good psychometric properties in measuring work-life interface[8]. Overall, by combining objective and subjective assessments, our approach will yield a nuanced understanding of how well neurology residents are balancing their professional training with life outside of work.

Given the potential impact of fatigue on physician well-being and performance, the survey will evaluate participants' level of daytime sleepiness as a proxy for fatigue. We will use the Epworth Sleepiness Scale

(ESS), a brief self-administered questionnaire widely used in clinical and research settings to measure general daytime sleepiness. The ESS asks respondents to rate their likelihood of dozing off or falling asleep in 8 common situations (e.g. sitting and reading, watching TV, …)[9]. In this study, an elevated ESS score will be interpreted as significant daytime sleepiness, which may result from chronic insufficient sleep during residency. By measuring sleepiness, we aim to quantify fatigue levels among neurology trainees and explore the relationship between sleep deprivation, burnout and quality of life. High fatigue is expected to be associated with higher burnout and worse work-life balance, underlining the importance of managing resident work hours and rest.

General quality of life will be measured using the World Health Organization Quality of Life – BREF (WHOQOL-BREF) questionnaire. The WHOQOL-BREF is a 26-item instrument developed by the World Health Organization (WHO) to provide a broad assessment of an individual's perceived quality of life across four domains: physical, health, psychological health, social relationships and environment. We will employ the French Belgian version of the WHOQOL-BREF, which has been translated and culturally adapted by WHO collaborators and used in French-speaking populations[10]. This questionnaire offers a holistic appraisal of well-being, complementing the more specific measures above. Participants rate facets such as energy and fatigue, emotional state, personal relationships and working/living conditions. The WHOQOL-BREF has proven psychometric robustness, with good internal consistency and the ability to discriminate quality-of-life differences in both healthy and patient groups. In our study, the WHOQOL-BREF will help situate neurology resident's overall quality of life in context and allow us to determine if high burnout or poor work-life balance is reflected in lower quality-of-life scores. By using this standardized tool, we ensure that the assessment of well-being extends beyond the work setting to encompass participants' broader life satisfaction and functioning.

The survey will also collect basic demographic and training-related information (age, gender, year of residency, hospital/university affiliation, involvement in research, family status) to characterize the sample and enable subgroup analyses. These contextual variables will allow us to examine, for example, whether burnout or quality-of-life outcomes differ by training year or personal factors. Finally, an exploratory qualitative component is included: at the end of the questionnaire, respondents will have the opportunity to answer one to three open-ended questions about their experiences and suggestions regarding well-being in residency. This qualitative data will be analysed thematically and will enrich the interpretation of the quantitative results by providing personal insights and concrete examples from the residents' perspectives. The mixed methods design thus offers a comprehensive approach, integrating validated scales with narrative feedback to thoroughly investigate the well-being of neurology trainees.

Each instrument chosen for this protocol is supported by validation studies and prior use in physician populations. By deploying these psychometric tools in tandem, the study will rigorously evaluate the multiple dimensions of neurologists-in-training's well-being – from burnout syndrome and its drivers to life quality and sleep health. The methodology aligns with recommendations to regularly measure trainee burnout and related factors with reliable instruments as a basis for targeted interventions[1]. The findings

are expected to identify key areas of concern and ultimately guide evidence-based strategies to enhance neurology residents' quality of life, training experience and mental health.

Statistical Methods:

Quantitative data will be analysed using descriptive statistics, including means and standard deviations for continuous variables and frequencies and percentages for categorical variables. Associations between key variables—such as burnout scores, quality-of-life measures, daytime sleepiness, workload indicators, and job satisfaction—will be examined using correlation analyses (Pearson or Spearman coefficients, depending on data distribution). Where relevant, multivariable regression models may be employed to identify independent predictors of burnout and related outcomes while adjusting for potential confounders such as demographic characteristics and training-related factors. All statistical analyses will be conducted using standard statistical software, and significance levels will be set a priori at $p < 0.05$.

Discussion

Burnout and decreased well-being among medical residents represent major challenges for healthcare systems, particularly in neurology where workload and emotional demands are substantial. This study addresses a critical gap by offering the first comprehensive assessment of neurology resident well-being in French-speaking Belgium. By integrating validated instruments with qualitative insights, it will capture both the prevalence of burnout and the contextual factors contributing to it.

Strengths and Limitations

The strengths of this protocol include its multicentre design, use of robust psychometric tools and mixed methods approach. These features will ensure a rich and reliable dataset capable of informing targeted interventions at local and national levels. The study aligns with the EAN Brain Health Mission, recognizing clinician well-being as an essential component of patient care and workforce sustainability.

Limitations include the cross-sectional design, which cannot establish causality and the reliance on self-reported data, which may introduce reporting bias. Nevertheless, these constraints are typical of well-being research, and the findings will provide essential baseline data for future longitudinal or interventional studies.

Declarations

Ethics and Dissemination

Ethic approval will be obtained from the appropriate institutional review board at Cliniques Universitaires Saint Luc, Brussels, Belgium, prior to study initiation. Participation will require informed consents, and all responses will remain anonymous and confidential. Results will be disseminated through submission to a peer-reviewed journal, presentations at national and international neurology meetings, communication

to neurology training programs and resident organizations, and integration into ongoing efforts to improve training conditions and resident well-being.

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Alissa Silva Gomes: Investigation, Writing (review & editing).

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Sponsors and committees:

This study has no external sponsor; it is investigator-initiated. No committees, observational minimal-risk study.

Trial registration:

The study will be registered on OSF Registries prior to data collection. Protocol and SAP will be publicly accessible upon publication. De-identified participant data, study instruments and statistical code will be deposited in OSF and made available upon reasonable request after publication.

Funding: this study received no specific funding.

Conflicts of Interest: the authors declare no competing interests.

Harms: no clinical harms are expected.

Participant Timeline:

All participants will follow the same brief study timeline. Neurology residents will first receive an invitation to participate via institutional mailing lists and the residents' association network. Upon accessing the survey link, individuals will be presented with an electronic informed consent form. Only residents who provide consent will proceed to the questionnaire. The survey is completed in a single session and requires approximately 10–15 minutes. Participation ends immediately upon submission of the completed questionnaire, and no further follow-up, visits, or additional assessments are planned. As this is a one-time, anonymous cross-sectional survey, no retention procedures or post-participation activities are required.

Protocol Amendments:

Any protocol amendments will be submitted to the ethics committee and updated in the study registry.

Acknowledgments:

The authors thank all neurology residents in French-speaking Belgium for their willingness to contribute to this study and for their ongoing commitment to improving training conditions and well-being within the specialty. We also acknowledge the support of the Hoffmann residents' association for facilitating communication and dissemination of the survey. The authors are grateful to the participating university hospitals for enabling this research and to colleagues who provided constructive feedback during the development of the study protocol.

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