

Meta-Analysis of Surgeon Burnout Syndrome and Specialty Differences

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OBJECTIVE: Surgeon burnout compromises the quality of life of physicians and the delivery of care to patients. Burnout rates and interpretation of the Maslach Burnout Inventory (MBI) complicates the interpretation of surgeon burnout. The purpose of this study is to apply a standardized interpretation of severe surgeon burnout termed, “burnout syndrome” to analyze inherent variation within surgical specialties.

DESIGN: A systematic literature search was performed using MEDLINE, PsycINFO, and EMBASE to identify studies reporting MBI data by surgical specialty. Data extraction was performed to isolate surgeon specific data.

SETTING: A meta-analysis was performed.

RESULTS: A total of 16 cross-sectional studies were included in this meta-analysis, totaling 3581 subjects. A random effects model approximated burnout syndrome at 3.0% (95% CI: 2.0%-5.0%; $I^2 = 78.1\%$). Subscale analysis of emotional exhaustion, depersonalization, and personal accomplishment indicated subscale burnout in 30.0% (CI: 25.0%-36.0%; $I^2 = 93.2\%$), 34.0% (CI: 25.0%-43.0%; $I^2 = 96.9\%$), and 25.0% (CI: 18.0%-32.0%; $I^2 = 96.5\%$) of surgeons, respectively. Significant differences ($p < 0.001$) in MBI subscale scoring existed among surgical specialties.

CONCLUSIONS: Approximately 3% of surgeons suffer from extreme forms of burnout termed “burnout syndrome,” although surgeon burnout may occur in up to 34% of surgeons, characterized by high burnout in 1 of 3 subscales. Surgical specialties have significantly different rates of burnout subscales. Future burnout studies should target the specialty-specific level to understand inherent differences in an effort to better understand methods of

improving surgeon burnout. (J Surg Ed ■■■■-■■■. © 2018 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: burnout, quality of life, surgeons

ACGME COMPETENCIES: Systems based practice, Medical knowledge

INTRODUCTION

A career in surgery is associated with demanding hours in a high-stress environment, but recent criticisms of pursuing a career in surgery include unprecedented scrutiny of outcomes, decreasing autonomy with increasing regulations for surgical residents, and a struggle to maintain work-life balance.¹⁻³ These factors contribute to a high levels of surgeon burnout, a phenomenon characterized by emotional exhaustion, cynicism, and reduced feelings of PA.⁴ Surgeon burnout not only compromises quality of life and relationships in the physician's personal life, but also influences the delivery of compromised medical care resulting in increased errors and patient dissatisfaction.^{5,6}

The Maslach Burnout Inventory (MBI) is the gold standard for assessing surgeon burnout across 3 subscales: emotional exhaustion (EE), depersonalization (DP), and personal accomplishment (PA).⁴ Despite having a validated assessment tool, significant variation in interpreting subscale scoring, appropriate cutoffs, and dichotomous classification of burnout hinders large-scale characterization in the surgical community.⁷ Depending on use and interpretation of the MBI, rates range markedly from as low as 2% with strict criteria to 56% with more lenient criteria for burnout classification.^{8,9}

Even with widespread attention in the last decade, both attrition and burnout remain serious issues threatening the future of the field. To better characterize burnout among

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surgeons and surgical specialties, we provide a comprehensive and quantitative meta-analysis of available data. The purpose of this study is to better understand the gap in knowledge regarding the current variability in literature-defined burnout, to integrate current data through a standardized interpretation of burnout syndrome, and to analyze inherent variation within surgical specialties in order to aid in future investigation and development of targeted interventions to improve the quality of life of surgeons.

MATERIALS AND METHODS

Study Selection

An OVID electronic search of studies listed in MEDLINE, PsycINFO, and EMBASE databases (Supplemental Fig. 1) was conducted. Search terms included: “quality of life,” “burnout,” “surgeon,” “surgical specialty,” and “United States” using medical subject headings (Supplemental Table 1). Inclusion criteria were English manuscripts published between January 1980 and July 2015 that used the MBI as the primary assessment tool to evaluate burnout in the United States; only studies that provided specialty-specific data were included. Excluded studies included those with medical students and other health professionals. Studies with both surgeon and nonsurgeon data underwent surgeon specific data extraction. The references to each article meeting inclusion criteria were reviewed to ensure relevant articles not captured within the aforementioned search were identified. The term “surgeon” was defined as residents in-training and attending physicians trained in a “surgical specialty” including: obstetrics and gynecology (Ob/Gyn), otolaryngology (ENT), orthopedic, general, plastic, surgical oncology, pediatric, neurosurgery, transplant, trauma, breast, endocrine, cardiothoracic, vascular, urology, and colorectal surgery. Individual title, abstract, and full manuscript review, and data extraction was completed independently by 2 reviewers (M.P. and M.S.), discrepancy for inclusion was reconciled by both parties. Establishing data homogeneity and data validation was completed by a third party (A.J.B. and A.K.H.).

Maslach Burnout Inventory

The MBI is the most commonly used and validated method for measuring burnout among healthcare professionals.⁴ Three independent subscales, or dimensions, within the MBI include EE, DP, and PA. EE reflects the perception of being emotionally overextended by one’s work, DP measures cynicism toward recipients of one’s services, and PA assesses feelings of personal satisfaction and sense of achievement in relation to one’s work. Scores are generated for each individual subscale and can be categorized into “low,”

“moderate,” and “high.” Dimensions of burnout can be described by a high degree of EE (> 30), high degree of DP (> 12), or low sense of PA (< 33).⁴

Statistical Analysis

Statistical analysis was completed using R 3.2.0.¹⁰ The proportion of surgeons experiencing burnout within one or more subscales and the corresponding 95% CI were gathered from each study. Meta-analyses employed the use of random effects models with all studies meeting explicitly defined criteria. Results are reported as weighted mean proportions with statistical significance defined at a level of $p < 0.05$ and heterogeneity among pooled studies evaluated with I^2 . Pearson correlation coefficients (r) are provided to assess the linear association between subscales. Subgroup analyses for surgical specialty was compiled using generalized linear models.

Outcomes

Primary endpoints were derived from the MBI assessment tool and used to characterize burnout syndrome, analyze individual subscales, and perform comparative analysis by specialty. Burnout syndrome was defined as being high-risk for burnout in each of the 3 subscales concurrently. The concept of “burnout syndrome”, a dichotomous classification based on meeting criteria in each of the 3 individual MBI subscales concurrently, is a concept adapted by the authors, which was not the original intended use of the MBI tool.¹¹

RESULTS

Included Study Characteristics

A total of 16 cross-sectional studies met inclusion criteria, generating a sample size of 3851 subjects (Table 1). Eight studies included residents/fellows ($n = 1819$).^{9,12-18} Eleven studies included attendings ($n = 2032$).^{8,9,17-25} Seven different surgical specialties were represented among the studies, including ENT, Ob/Gyn, orthopedic, general, neurosurgery, surgical oncology, and transplant. Eleven studies reported sex ($n = 3278$), with an average breakdown of 78.2% males and 21.8% females.^{9,12-16,18,19,22,23} Eight studies reported age ($n = 1698$), yielding a mean age of 40.7 years.^{8,9,13,15,16,19,21,25} Due to single studies representing surgical specialties, four specialties were grouped into a single “other” category for subsequent analysis that included data from general surgery, surgical oncology, transplant surgery, and neurosurgery.

Overall Burnout

Thirteen studies assessed overall burnout among surgeons, including a total of 3385 subjects.^{8,9,13-19,21-23,25} Meta-

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