

Systematic Review Article

Surgeon Burnout: Factors and impact on patient care

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ABSTRACT

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Surgery, as a field itself, is a high stress and high pressure workplace environment. The difficulty that surgeons face, in maintaining their work-life balance along with the increasing litigation instances, has made this profession a less rewarding one. This review was carried out in order to determine the prevalence of burnout among surgeons, to identify the risk factors for it, and to employ mitigation strategies to reduce the likelihood of burnout. All full-text articles between 2011-2021 reporting data, related to burnout in surgery according to the criteria specified, were included in this study. The bibliographic databases that were searched included PubMed, MEDLINE and Google Scholar, with data extracted on the characteristics of the articles, including the burnout prevalence and its factors. Sixteen articles were finally included after meeting the determined criteria. The selected studies included over 27,000 participants. Results showed that the most commonly identified risk factors, for surgeons' burnout, were age, marital status, financial standing, the outcome of their interest, the balance between work and personal life, experience in the field, and gender. The high prevalence of burnout among surgeons is extremely concerning and the identified factors responsible should be explored by surgeons, hospital management boards, training centers in order to find ways to prevent it and to ensure a healthy workplace environment and high-quality surgical patient care.

Keywords: Burnout, Medical errors, Patient safety, Surgeons, Prevalence, Surgical trainees.

INTRODUCTION

Surgery as a profession is directly associated with work in a high-stress and high-precision environment¹. Recently, pursuing a surgical profession is being significantly critiqued, because it includes unprecedented scrutiny of clinical outcomes, a continuous struggle to maintain balance in work and personal life and perpetually increasing rules and regulations for the surgeons².

In a few recent years, there has been an alarming trend in burnout and exhaustion among doctors and surgeons³. Burnout in physicians has become a topic of interest for research in the last decade. Researchers are probing the factors and prevalence of burnout in almost every specialty and subspecialty of the medical profession. In professional terms, burnout has a direct association with reduced quality of care for patients due to increased medical errors⁴, and unprofessional conduct of the physician. Personally, burnout is directly related to a reduction in professional/career satisfaction, poor quality of life, lack of physical activity, and alcohol/substance abuse⁵. Generally, burnout has a significant impact on the medical profession which tends to affect the professional performance and the personal life of doctors⁶.

Burnout is categorized as a syndrome that characterizes depersonalization, decreased personal accomplishment (due to work stress) and emotional exhaustion⁷. A few factors which

put physicians at high risk of burnout syndrome are long duty hours, a challenging patient or quality care, difficulty in maintaining personal life and work balance, delayed response or gratification, and health care environment⁸.

During the era of 1960s and the 70s, burnout syndrome was first recognized as a syndrome in social psychology. This term was first used for the lawyers working in vulnerable communities, volunteer staff who were serving in urban clinics for managing drug addicts, and as a description for the officers on probation⁹. At the end of the 1990s, researchers shifted the categorization of burnout from individuals in human services to those populations which were educational or not involved in human services as well^{10,11}.

An outcome measure as MBI (Maslach Burnout Inventory) is the gold standard measure for the assessment of burnout. MBI consists of three subscales as Personal accomplishment (PA), depersonalization, and Emotional exhaustion (EE). Maslach described these three subscales as (1) emotional exhaustion due to overwhelming situations, (2) detached and cynical feelings due to job environment or depersonalization (DP), and (3) lack of effectiveness or personal acknowledgment or accomplishment. According to Balch et al., there are two most common symptoms of burnout in terms of healthcare behaving with colleagues

and patients as materialistic objects instead of human beings and a feeling of emotional depletion¹².

According to the statistics, there is an alarming increase in surgeons-related burnout, which is carrying an enormously negative impact on the professional and personal lives of surgeons. Moreover, this burnout has a direct impact on the financial resources and social behaviors of the health care system around the world. Literature data depicts that more than 70% of residents of surgery and more than 50% of working surgeons meet the criteria of burnout syndrome¹³.

Research studies from the year 2011-2014 indicate that the prevalence of burnout accelerated from 45%-54% among the 6000 working surgeons in the US in this period¹³. Surgeons are the most vulnerable professionals having more than average burnout than other physicians. Burnout is at a peak among surgeons during surgical residency due to chronic sleep deprivation, high demand for patient care, and harsh working hours. According to studies, the prevalence of burnout among surgeons was about 69-75%, which is more than the average percentage of burnout among non-surgical physicians¹⁴. Surgeon subspecialties are the most vulnerable categories for burnout. According to Medscape Physician Lifestyle Report 2015, burnouts ratios range from 37-60 percent across all the medical specialties. According to this report, surgeons make the top of

the list amongst these professionals having more than 50% of burnout¹⁵. Burnout results in several adverse consequences as attrition, suicidal ideation, disruptive behavior, strain in personal relationships, depression, and indulgence in substance abuse¹⁵.

Maslach Burnout Inventory is a validated tool for assessing burnout among surgeons. There are a few variations in interpreting the scoring of subscales, dichotomous classification, and cutoffs. These variations tend to hinder the characterization of MBI on a larger scale among the surgical community¹⁶. Depending upon the interpretation and use of the MBI, its rates may range from 02% to 56% (strict criteria) giving more lenient burnout criteria for classification¹⁷. Over the past decade, awareness regarding the prevalence of burnout has been increased. Furthermore, there is advancement in accurate assessment and identification of physicians/surgeons suffering from the symptoms of burnout. This systematic review aims to conduct a precise and accurate review and help in identifying the studies based on prevention, identification, and treatment of burnout among surgeons.

METHODS

Articles included in this systematic review were searched and identified by searching databases as PubMed, Google Scholar, and MEDLINE. The period of selected studies was kept from 2011 to 2021, while reference lists

of the selected articles were also reviewed. MeSH keywords used for the articles search were surgeons, burnout, professional burnout, physicians, job satisfaction, psychological stress, medical residency, and surgical subspecialties. One independent researcher reviewed

the abstracts of the articles having prevalence, treatment and precautionary measures of burnout/exhaustion in surgeons. The study diagram for the reviewed articles is reported in Figure 1.

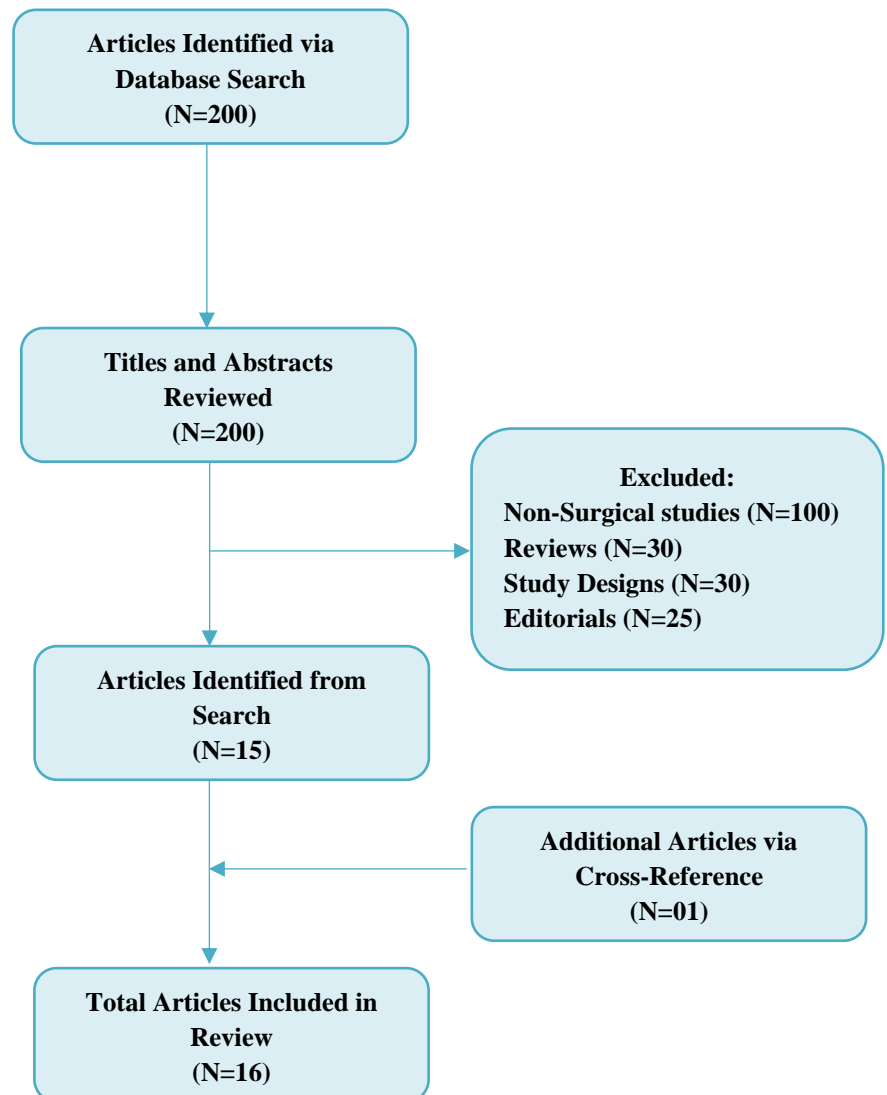


Figure 1. PRISMA diagram for selection of articles in this review related to burnout/exhaustion in surgical subspecialties or surgeons.

Criteria of Exclusion and Inclusion: All the studies after 2010 were eligible for inclusion if they satisfied the criteria of eligibility. All the excluded articles were based on a few characteristics as 1) non-English language, 2) did not

include the terms as surgical residents or surgeons, 3) did not include or address the identification/prevalence, intervention, prevention, risk factors, or consequences of burnout, 4) publication date less than 2011, 5) studies were

editorial, reviews (traditional or systematic), comments, and case reports. The study designs included in this systematic review were RCTs (randomized controlled trials), longitudinal or observational studies, non-randomized trials, surveys, and cross-sectional studies. Reference

lists or citations of included articles were also cross-checked to ensure the accuracy of included articles.

The outcome measure for determining burnout, the components addressed measured and their interpretations are shown in Table 1.

Outcome Measure	Components Addressed Measured	Interpretation
MBI (Maslach Burnout Inventory) Lim WY, et al ¹⁸ , 2020	<ul style="list-style-type: none"> • Personal Accomplishment • Depersonalization • Emotional Exhaustion 	Professional burnout is classified as follows if the score is: <ul style="list-style-type: none"> • More than or equal to 27 for emotional exhaustion • More than or equal to 10 for depersonalization and personal accomplishment
CBI (Copenhagen Burnout Inventory) Fiorilli C, et al ¹⁹ , 2015	<ul style="list-style-type: none"> • Professional burnout • Personalized burnout • Occupational burnout 	CBI depicts 3 burnout stages: <ul style="list-style-type: none"> • Severe burnout – if the score is 100 • High burnout – if the score is between 75 and 99 • Moderate burnout – if the score is between 50 and 74
PWBI (Physician Well-Being Index) Lall MD, et al ²⁰ , 2019	<ul style="list-style-type: none"> • Depression • Fatigue • Burnout • Physical quality of life • Mental quality of life 	<ul style="list-style-type: none"> • A 9-item Likert type scale having one score for each yes as a response to the question. • A 7-item WBI was introduced for the medical student, but later it was modified to 9-items for the physicians. • Also known as MCPWBI (Mayo Clinic Physicians' Well-being Index)
PGWB (Dupuy Psychological General Well-Being Scale) Grossi E, et al ²¹ , 2006	<ul style="list-style-type: none"> • Well-being • Depression • Anxiety • Self-discipline • Body fitness • Strength or vitality 	<ul style="list-style-type: none"> • PGWBI covers 6 dimensions having 3 to 5 items in each subscale. • Multiple choice questions having scores range from 0-5, while zero being lowest and five being highest • A sum of all the scores can either present a higher or lower well-being score (0-110) • Higher PGWBI scoring depicts greater psychological well-being in an individual

<p>Medical Outcomes Study Short Form Webster KE, et al²², 2016</p>	<ul style="list-style-type: none"> • Mental QOL • Physical QOL • 	<ul style="list-style-type: none"> • Scoring for this outcome measure ranges between 0 to 100, where 0 indicates the low levels and hundred depicts the high level of health • Consists of two components: Mental component score and • Physical component score • Originally condensed from thirty-six item questionnaire for measuring QOL
<p>Linear Analog Scale Assessment of Quality of Life Cazacu IM, et al²³, 2020</p>	<p>Quality of life over last week including different aspects as:</p> <ul style="list-style-type: none"> • Emotional • Intellectual • Physical • Spiritual 	<ul style="list-style-type: none"> • A 5-items outcome measure having the primary purpose of measuring QOL in an individual • Scoring can range from 0-10, while zero being the worst and ten being the best score for QOL
<p>Primary Care Evaluation of Mental Disorders (PRIME-MD) Chigerwe M, et al²⁴, 2018</p>	<p>In addition to eating disorders, this tool evaluates mental disorders' four groups:</p> <ul style="list-style-type: none"> • Anxiety • Mood swings • Alcohol consumption • Somatoform 	<ul style="list-style-type: none"> • A 26-items questionnaire having scores for each question • A higher score on this scale indicates less QOL and vice versa
<p>Short grit and Grit scale Datu JAD, et al²⁵, 2016</p>	<p>Long term objective and subjective goals Perseverance</p>	<ul style="list-style-type: none"> • Used for quantifying the grit • A 17-items questionnaire • The average of the scores depicts perseverance and long term goals motivation

QOL: Quality of Life.

Table 1. The outcome measure for determining burnout, the components addressed measured and their interpretation.

RESULTS

A total of 200 articles were identified through different databases. 185 studies were omitted due to a few reasons: 1) Non-medical/surgical and articles in language other than English (N = 100), 2) Design of the study (N = 30), 3) Case series/report and editorials (N = 25), 4) Review articles (N = 30). One study was added through cross-referencing. So, 16 total studies

were involved in this systematic review through databases (Figure 1). All the studies gathered were related to the assessment of burnout and wellbeing. Moreover, these studies identified burnout, its risk factors, interventions, prevention, and other factors associated with it (Table 2). A summary of all the included studies along with their data are demon-

strated in Table 2. This data depicts the prevalence of burnout in every research in at least one or more than one domain of the MBI. This

review gives a detailed insight into the increasing frequency of burnout among medical practitioners.

Author (year)	Design of study	Specialty	Sample Size N	Results of burnout
Shanafelt TD, et al²⁶ (2012)	Cross-sectional study	General Surgery	7197	<ul style="list-style-type: none"> • Burnout was highly prevalent in the surgeons • Surgeons who took part in aerobic exercises (55.0%) and strength training (36.3%) had higher QOL
Ripp JA, et al²⁷ (2015)	Longitudinal study	General Surgery	156	As per MBI: <ul style="list-style-type: none"> • Depersonalization in 28% of surgery residents • Emotional Exhaustion in 28% of residents
Qureshi HA, et al²⁸ (2015)	Survey study	Plastic surgery	1691	<ul style="list-style-type: none"> • 1/4th plastic surgeons in the US have confirmed burnout and low QOL (29.7%) • Risk factors for burnout were annual income, subspecialty, practice, academic ranking, and night shifts.
Jesse MT, et al²⁹ (2015)	Cross-sectional Survey study	Transplant surgery	218	<ul style="list-style-type: none"> • Emotional exhaustion– higher levels among 40.1% of surgeons • Depersonalization – 17.1% population • Personal accomplishment – 46.5 had lower levels of PA
Celik SU, et al³⁰ (2021)	Cross-sectional Survey study	General surgery	615	<ul style="list-style-type: none"> • Burnout was prevalent in 69.1% of participants • Severe burnout was prevalent in 22.0% of participants
Commander S, et al³¹ (2020)	Cross-sectional Survey study	General surgery	131	<ul style="list-style-type: none"> • Higher levels of burnout in 38% of participants • Moderate to severe depression symptoms in 48% of the sample
Robinson DBT, et al³² (2020)	Cross-sectional study	General surgery	158	<ul style="list-style-type: none"> • 59% of the surgical trainees demonstrated burnout in more than one domain of MBI. • Risk factors for higher Emotional exhaustion were female gender, grading, and being childless
Elmore LC, et al¹⁴ (2016)	Cross-sectional study	General surgery residency	665	<ul style="list-style-type: none"> • 69% of participants had a prevalence of burnout in more than one domain of MBI. • Female gender had more tendency towards than males
Zhang JQ, et al³³ (2021)	Cross-sectional study	Oncology surgeons (breast surgery)	750	<ul style="list-style-type: none"> • Surgeons who had been practicing for more than five years had higher levels of burnout.
Balch CM, et al¹¹ (2011)	Cross-sectional study	Oncology surgeons	407	<ul style="list-style-type: none"> • 36% of the participants were suffering from burnout during their practice

Dyrbye LN, et al³⁴ (2011)	Cross-sectional study	Mixed specialties	7858	<ul style="list-style-type: none"> • Women had higher levels of burnout – 43.3% participants • Males – 39.0% participants
Klimo P Jr, et al³⁵ (2013)	Survey study	Neurosurgery	85	<ul style="list-style-type: none"> • The rate of burnout was 27% • Depersonalization score – 4 • Emotional exhaustion – 13 • Personal accomplishment - 39
Oreskovich M, et al³⁶ (2012)	Cross-sectional study	Mixed specialties	7197	<ul style="list-style-type: none"> • Burnout in alcoholic surgeons (alcohol abuse) was 35% • Burnout in non-alcoholic surgeons (alcohol misuse) was 30%
Streu R, Oreskovich MR, et al³⁷ (2014)	Survey study	Plastic surgery	506	As per MBI: <ul style="list-style-type: none"> • Emotional exhaustion – 29% • Depersonalization – 16% • Personal accomplishment – 5%
Shanafelt TD, et al³⁸ (2015)	Cross-sectional study	Multiple specialties	1006	<ul style="list-style-type: none"> • Surgical subspecialties and general surgeons had rates of burnout ranging from 50-64%

MBI: Maslach Burnout Inventory, QOL: Quality of Life.

Table 2. Research articles included in this review.

DISCUSSION

Burnout or mental exhaustion in medical specialists is proliferating at an exceptional rate ranging more than 50% of surgeons all over the world³⁸. Usually, burnout goes underreported because in many studies burnout is based on self-assessment. Self-assessment studies can suffer from a few limitations as the response time, the response rate and other factors. In this review, the included studies revealed that the burnout has been linked with other consequences as decreased QOL, depression, increased medical errors or mistakes, and suicidal ideation. Healthcare is constantly undergoing changes and innovations to improve patient satisfaction. These changes are putting extra demand on surgeons and physicians in healthcare institutions. Doctors and surgeons are suffering from additional regulations, in-

creased clinical productivity demands, less funding, more patient-to-physician ratio, inefficient systems, stress from electronic medical records of patients, and difficulty in balancing personal-work life.

So, these changes in the system are letting the surgeons have an additional stress and burnout in their work field. This review highlights the prevalence and proliferation of burnout by including studies from 2011 up until now. Majority of the included articles in this review was cross-sectional, because RCTs are in less to none ratio regarding burnout in surgeons. All of the included articles are based upon raising the awareness of burnout and its consequence on emotional or physical well-being. Outside the work field, several factors are playing their role in stress and burnout. Several

programs are running to promote the physician well-being and reduce burnout or stress, by teaching them a proper response to external negative stimuli during their work.

It must be noted that several studies have conducted extensive research on the prevalence of burnout and its consequences. There are a few common risk factors that negatively affect the QOL and increase burnout. Among surgeons, the most commonly reported risk factor for burnout was the imbalance between work-personal life. The most commonly identified risk factors for surgeons are age, marital status, financial standing, the outcome of their interest, the balance between work and personal life, experience in the field, and gender⁹. Surgeons with less field experience are more likely to suffer from burnout in comparison to experienced ones. Other factors as married life and the responsibility of children can also affect the professional life of an individual. In some studies, marriage happened to be a positive factor for decreasing burnout irrespective of the type of relationship or profession of the spouse²⁶. In surgeons, marriage can positively impact their quality of life while some studies do not support these results. There is still an immense need to conduct vast research on the risk factors associated with burnout. There is still a large gap between the causes and consequences of burnout in the life of a professional surgeon or medical practitioner.

In the year 2014, Mayo Clinic³⁹ conducted an

RCT on 74 physicians, focusing on their mindfulness, experiences, and reflection. After the intervention program, MBI reported that engagement in work and empowerment increased by 5.3 points and depersonalization rates decreased by 15.5%, in the interventional group. Meaningfulness in the work increased by 6.3% in the interventional group, while it decreased by 6.3% in the control group.

Another program by the Stanford University offered well-being guidelines for life-work balance to the surgeons and physicians³⁹. The need for this program occurred due to the elevated suicide ratio among medicine or surgical residents. Another program⁴⁰ for physician well-being showed that a formal implementation of well-being programs for improving the well-being of residents can impact residents' life satisfaction, quality, emotional exhaustion, stress, and emotional intelligence positively. After one year of implementation of this program, residents showed a positive trend with stress decreasing from baseline, emotional exhaustion and depersonalization in MBI decreased, satisfaction rates improved in productivity, skills, time management, and work-life balance. This program was evaluated as helpful to increase positive impact from 80-90 percent.

These well-being programs are promising, but they are rare in the medical field specifically in the surgical department. Formal and keen implementation of these programs can help in

preventing burnout, its symptoms, and consequences in physicians, but it requires further data for evaluating the benefits of these programs. To build effective programs in the future, we need a complex and further evaluation of other factors, which can influence burnout among surgeons. In most of the previous research studies, a few important points as inter-gender interaction, marriage problems, and fertility issues were not discussed. Such insights can help provide careful guidance and a targeted approach for coping with burnout strategies. Despite best efforts to highlight important data in this review, there are a few limitations that need to be addressed. This review has been limited to studies that were only available in the English language, which may result in potentially missing some important articles which may have had an impact in other languages. One limitation was based on the measurement of burnout. Different studies identified the factors affecting burnout with different methods, and it was not possible to perform a quantitative analysis for them beforehand and while writing the narrative bit it may be prone to bias as author belongs himself to the surgical field. The heterogeneity of the populations is an important limitation to argue, as factors responsible for burnout in some developed countries may not be the same as in third-world countries and it may differ within the surgical population as well differing from consultant level to junior level.

CONCLUSION

Awareness of burnout is a significant factor, but finding a pathway, resources, and solutions to this problem is even more necessary at this time. The most crucial factor in burnout management or prevention is teaching the coping mechanisms or skills to the medical professionals to control their problem in the initial stage. Throughout their careers and professional work, surgeons are the ones who undergo extreme stress and responsibility. In today's literature and research, burnout coping/ minimizing strategies and programs are lacking to guide people according to their needs. We need a systematic evaluation, resources, efficiency, and feedback monitoring from the participants to develop a working program against burnout and other psychological culprits. With the help of these physician-friendly programs, a lot of negative consequences of burnout are preventable before they start affecting the personal or professional life of the physician.

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Competing interests:

The author declares that he has no competing interests.

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