

# Burnout among Turkish Physicians: A Systematic Review

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## Abstract

**Introduction and objectives:** By evaluating systematically and collectively studies examining burnout and accompanying factors of physicians in Turkey, we aimed to obtain a meta-perspective of the relevant reader or researcher.

**Material and Methods:** English and in Turkish databases (Pub Med, Google Scholar, Ulakbim) were searched by using key words of physician, burnout and Turkey to identify Turkish physician burnout studies that have been published.

**Results:** The databases search resulted in finding of forty-nine articles most of which were regional and only seven representing the nationwide perspective. A total of 12,598 physicians were evaluated in the surveys. The calculated mean values, supposedly roughly representing the total universe evaluated in all studies, were 18.3 for emotional exhaustion (EE), 7.9 for depersonalisation (DP) and 20.1 for personal accomplishment (PA), respectively.

**Conclusion:** There is a low level of EE, DP and a high decrease in the sense of PA in physicians working in Turkey. The overall burnout experienced by them is not very high, but also is not very low. Female physicians appear to be at higher risk for EE sub-dimension and the risk of burnout is reduced with increasing age or experience.

**Key words:** physician, burnout, review, Turkey.

..... She takes a deep breath, tries to ignore the gnawing pain in her upper abdomen and the headache from lack of sleep, glances at her notes, and realizes that the first patient is a fourth opinion for abdominal pain dating back more than 20 years. She throws her notes down on the floor and screams at the scheduler, "This is completely inappropriate! I am sick and tired of seeing patients with chronic abdominal pain. If this happens again I'll make sure you are fired....."

## Introduction and Aims

The concept of burnout, which can be seen with all its nakedness in the upper passage (1) an excerpt from a case report, is one of the important phenomena of recent times. The concept was first used in the novel "A Burnt-Out Case" (2), published in 1961, by the British writer Graham Greene. The novel is about an architect who collapsed psychologically, quitting his job and escaping to the African forests; describes how excessive exhaustion turns into anger towards work, and how the individual becomes hateful of his job. It was first used in science literature by H. Freudenberger. The article (3) published by Freudenberger in 1974 with his colleague G. North was based on the observations of volunteer staff at a free clinic for drug addicts. He defined burnout as a state of mental and physical exhaustion caused by overly demanding work environments, characterized by a series of signs such as fatigue, headache, insomnia, irritability, and introverted thinking. After the publication of Freudenberger's article, interest in "burnout" grew. C. Maslach defined burnout as emotional exhaustion (EE), depersonalisation (DP), and work-related personal accomplishment (PA). In 1981, C. Maslach and S. Jackson published the principle instrument (4), the Maslach Burnout Inventory (MBI), which is widely used to assess burnout today. Over time, Maslach's burnout conceptualization was also adopted by the World Health Organization (WHO), although there were some counter publications in the following period.

Burnout is not included as a separate diagnostic code in the current revision of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5); it is coded as "Adjustment Disorders and Undefined Trauma and Stressor Related Disorders" (5). International Classification of Diseases (ICD-10) accepted burnout as one of the factors affecting health status and access to health services, and coded it under the subtitle "Z73.0 non-medical life management difficulties" (6). ICD-11, a code named "QD 85 Burnout" is available in the new version (7) and expresses the situation as follows: Burnout is a syndrome thought to be caused by chronic workplace stress that cannot be managed successfully. It is characterized by three dimensions; 1) energy depletion or emotional depletion; 2) increased mental distance from one's work or negativity or cynicism about one's job; and 3) reduced sense of professional satisfaction and personal accomplishment. Burnout specifically refers to phenomena in a professional context and should not be used to describe experiences in other areas of life. Apparently, the burnout code definition of ICD11 was taken almost exactly from MBI's. MBI consists of 22 items, divided into three sections, each focusing on one of the three critical burnout patterns. In the answers given to the statements in the scale, it is scored as "never" 0, "very rare (several times a year)" 1, "sometimes (several times a month)" 2, "more time (a few times a week)" 3, and "always (everyday)" 4. Statements evaluating EE and DP dimensions are negative and the PA dimension consists of positive expressions. In other words, while increasing scores in EE and DP sub-dimensions indicate burnout, decreasing scores in PA expressed burnout. 1,2,3,6,13,14,16,20th rank expressions were evaluated with EE dimension (score range 0-36); 5,10,11,15,22nd rank statements with PA dimension (score range 0-20); the statements in ranks 4,7,12,17,18,19,21 are related to the PA dimension (score range 0-32). Generally, a cut-off value was not determined in the evaluation of the scale and the scores were expressed separately in three sub-dimensions as mean  $\pm$  SD. However, in some studies, an evaluation classifying the three sub-dimensions as lower, middle and upper groups express them separately in certain cut-off values also used. The translation in Turkish and validity study of this scale was conducted and published by C. Ergin from Hacettepe University in 1991 (8). Historically, MBI has focused on service professionals (teachers, social workers, health workers, etc.) working face to face with people (9, 10). The professional burnout has a special importance of people working in the field of health, because of the nature of the service they provide and the special group to whom they provide services. Burnout in this occupational group may cause the applicants not to meet their needs adequately and it may decrease the quality of health care. Among the healthcare professionals, there is an additional burden of professional, moral and legal responsibility imposed on physicians. Because of this burden, and moreover, due to their natural characteristics such as compulsiveness, perfectionism, denial of personal vulnerability, and being brought up by working in a medical culture based on delaying to achieve pleasure, physicians are more prone to burnout and even deny that they are exhausted. Therefore, it makes them a special and risky

group that should be evaluated as separate from other healthcare professionals in terms of burnout.

In addition, all over the world in the last 30 years, shifting to marketing and to populist policies of the health service, the pressure of reimbursement institutions and the impossibility of fulfilling expectations created among the people who receive the service etc, all dominate the professional traditions of physicians, increase the workload and suppress their income. Also being surrounded by malpractice laws causes health professions to take precautions through increased use of laboratory or imaging and exaggerated detailed medical records during their daily practice (1). All of this results in the spread of burnout among physicians of pandemic-shaped proportions. As a matter of fact, a study conducted in the USA found that physician burnout increased from 45% to 54% between 2011 and 2014, but there was no such increase in other occupational groups in the same period (11). One of the largest studies published to date, involving 7,288 physicians thought to represent 814,000 physicians who are members of the American Medical Association (12), the highest rates of burnout were found in the emergency room (52%) and intensive care (50%) physicians and the lowest burnout rates, which can still be considered very high, were found in psychiatrists (33%) and pathologists (33%). In a study conducted by Shanafelt et al. (13), it was found that 45% of physicians experienced at least one dimension of burnout. In another large online physician survey (14), burnout prevalence was reported as 39.8%.

In this review article, by evaluating systematically and collectively studies examining physician burnout and accompanying factors in Turkey, we aimed to obtain a meta-perspective of the relevant literature or research to highlight the issues.

## Material and Method

Databases in English and Turkish (Pub Med, Google Scholar, Ulakbim) were searched by using key words of 'physician', 'burnout' and 'Turkey' to identify Turkish physician burnout studies that have been published. For studies that were not in the first screening list but were included in cross references, a study-based secondary manual search was performed to reach relevant articles. Studies published in English or Turkish until June 2020, using MBI for determining burnout, available in full text and which included only physicians were selected. Each study was evaluated on a modified five-point Nottingham-Ottawa scale to assess bias risk. The risk of bias was assessed in five different areas: 1) representativeness of the sample (low risk - multiple institutions / specialties; high risk - single institution / specialization), 2) sample size (high risk - less than 200; low risk - 200 and above), 3) response rate (low risk - 80%; high risk - <80%), 4) assessment of burnout (low risk - use of MBI to assess burnout; high risk - use of a non-standard tool other than MBI) and 5) quality of reporting (low risk - burnout defined using predefined thresholds published in the literature; high risk - burnout prevalence defined using the authors'

own thresholds or no burnout reporting). Each criterion was scored 1 (low risk of bias) or 0 (risk of high bias), and the maximum score achievable was 5 (higher scores indicate higher study quality). The total numerical score of 3 points or less corresponds to a high risk of bias (low reliability). The authors independently assessed the risk of bias for each study, and conflicts were attempted to be overcome by a joint review meeting of the two authors. EE, DP and PA mean scores of each study were multiply by subject number of each study in the first step and secondly all finding numbers in first step added and divided to the total subject number of studies, to find an weighted average value that would roughly represent the universe. Since it was designed as a systematic review and collective evaluation of the published studies, it did not require any ethical committee and administrative permission.

## Results

The article search in the databases resulted in finding 49 articles that met our inclusion criteria. The research tags and the results are summarized collectively in Table 1 (15-63). Most of those 49 studies were regional and the only seven studies represented the full nation which almost all of were limited to a specific specialty, except one including all physicians. A total of 12,598 physicians consisted of assistant physicians (in 21 studies), family physicians (in 7 studies), all physicians (in 13 studies), emergency physicians (in 2 studies), urology specialists (in 1 study), chest physicians (in 1 study), paediatric surgeons (in 1 study) and psychiatrists (in 2 studies), were included in the studies. The calculated mean values of means supposed to roughly represent the total universe evaluated in all studies, were 18.3 for EE, 7.9 for DP and 20.1 for PA. From aspects of the cut-off values determined by Ergin et al. (8), the calculated mean scores reflect low burnout in EE, in DP and high burnout in PA. The results were reported as percentage (%) in 6 studies (15,40,48,50,58,60), as according to the cut-off value grouping in two studies (40,48), and the overall burnout prevalence was presented in only two studies (15,50). All other studies preferred a presentation in the form of a mean  $\pm$  SD score. Many parameters were evaluated in terms of relation with burnout. In five studies (39,41,47,51,61), EE was higher in female physicians, in another six studies (34,28,42,43,50,61) DP was higher in male physicians, and in another four studies (23,38,49, 61) PA scores were lower in female physicians. Gender was evaluated with no relation to burnout in the remaining studies (16,18,20,21,24,44,45,46,48,57,58,59,60,62,63). In a study (25), PA of physicians over 40 years of age was found to be lower than physicians under 29 years old. However, other studies (19,22,26,30,32,33,42,44,50,51,52,55,56,61,62) reported that the risk of burnout decreased with increasing age. In nine studies (20, 21, 23, 46, 48, 49, 53, 57, 59), no relationship was found between age and burnout. Marital status was associated with burnout in twelve studies (16,34,38,41,42,45,46,49,52,54,56,61) and in thirteen studies (17,18,20,21,23,24,37,44,48,43,57,59,63) it was found to be unrelated. Presence and number of children was associated with burnout in three studies (38, 43, 56),

and unrelated in five studies (16,20,21,53,59). Existence of hobbies, time allocated to hobbies, frequency of social activities and time allocated to social activities, reading non-medical books, going on regular vacation, regular sports, having leisure time, having good and sufficient time with the family, supportive social environment and not feeling lonely reduced burnout in 12 studies (15,16,18,19,25,26,37,42,44,48,52,60). Only two studies (15,21) that evaluated one or more of these factors were found unrelated to burnout. Neurotic personality traits, self-esteem, problem or emotion-oriented solutions and management strategies, mature or immature psychological defence mechanisms, depression-anxiety levels, history of antidepressant usage and sleep duration and irregularity, love of profession, and love of the chosen branch, effective factors in the process of profession selection (18,20,21,24,26-29,35,37,45-47,50,52,55,60,62) were all related to the burnout, while in only a few (18,46) were they unrelated. The presence of a diagnosed chronic disease was considered to be associated with burnout in some studies (28,47,61), and unrelated in others (24,37,52,53). Compatible, non-discriminatory, easily accessible consultant and manager-supported work environment with low risk for work accident or occupational disease, low stress and time pressure, was found to be associated with low burnout scores in eleven studies (20,24,26,37-39,44,47,49,52,60). Alcohol was related to burnout in some studies (16,50,59,61) and unrelated in other studies (20,45,48,52,53). Smoking was also associated with burnout in some studies (16,20,37,48,50,52,59,61), and unrelated in a few others (45,53,57). Monthly income level was deemed unrelated in some studies (16,20,28,30,37,43,47,49,52) and it was related to burnout in some others (18,21,48,53,57,60). Weekly working hours, working in a shift manner, number of night-shifts, number of patients cared for daily, was related to burnout in lots of studies (16,18,20,22,26,29,30,33,34,39,42,47,48,53,55,59,60,61), and in a few studies (16,17,18,21,46,52) was unrelated. The total time spent in the profession was evaluated in lots of studies (21,22,26,32,33,34,38,42,43,45,49,55,56,59,61) related to burnout, and in some studies (16,17,18,20,23,24,46,48,53) it was considered unrelated. The history of exposure to physical and verbal violence was evaluated in five studies (16,26,33,36,41) and was found in all, of being associated with burnout. The city being worked in, the hospital, the unit, the branch, being academic staff or not, whether or not to undertake responsibilities as a manager, were all related to burnout in lots of studies (16,19,20,22,27,30,33,37,39-43,47,49-52,54-56,58,61-63) and it was evaluated unrelated in some others (15,17,18,23,48,53,57,59). The malpractice case story was the subject of a study (59) and it was considered unrelated to EE and DP, but related to PA.

**Table 1.** Surveys on physician burnout in Turkey (ND: No Data)

Name Year Ref. no	Place – region - city	Included doctors Number (N) Response-rate (%)	Burnout dimensions				Nottingham-Ottawa scale
			Emotional exhaustion (EE%) mean±SD	Depersonalisation (DP%) mean±SD	Personal accomplishment (PA%) mean±SD	Overall Burnout mean±SD (OB%)	
D.Y.AKSOY 2014 (15)	ANKARA	Resident physicians N=55/100 Response-rate: 66% paediatrics internal medicine	18 % 17 %	6% 7 %	20.5 % 20 %	27% 33%	2
B.ERDUR 2015 (16)	DENİZLİ	Emergency room physician N=174/205 Response-rate: %85 male female	24.6±6.0 24.1±6.7	11.0±3.2 10.7±4.1	30.0±3.4 29.9±3.9	ND	3
A.GÜL 2017 (17)	NATIONWIDE	Physiatry physicians N=201/? Response-rate: %? Pharmacotherapy Physiotherapy	24.6±6.9 23.2±4.6	10.5±4.1 9.8±3.5	19.5±5.1 18.1±4.2	ND	2
N. KARAOĞLU 2015 (18)	KONYA	Paediatrics resident N=74 Response-rate: %79	23.8±5.3	14.9±2.8	26.7±3.6	ND	3
Z.KOŞAN 2018 (19)	ERZURUM	All-physicians N=663/730 Response-rate: % 90	15.6±7.0	5.7±3.9	21.0±4.4	ND	4
E.PRINCCI 2015 (20)	ELAZIĞ	Resident physicians N=222/261 Response-rate: % 86	22.3±8.4	8.7±4.7	18.7±5.9	ND	3
N. TURGUT 2016 (21)	İSTANBUL	Resident physicians N=127/? Response-rate: %? 1. year 2. year 3. year 4. year	15.5±3.3 15.9±3.5 14.2±3.1 13.9±2.8	11.1±6.4 9.5±5.2 10.0±5.1 8.8±4.6	32.1±6.6 32.3±6.1 29.6±7.1 28.1±6.0	ND	2
M.ANIL 2017 (22)	İZMİR	Paediatrics resident N=102/111 Response-rate: % 91,8	15.8±6.4	10.7±7.8	32.9±12.5	ND	2

A.T. SUNTER 2006 (23)	SAMSUN	Practitioner physicians N=85/112 Response-rate: % 75.9 male female	14.6±5.7 15.4±6.2	4.5±3.0 5.4±3.2	21.4±2.9 19.5±4.45	ND	2
Z.BAYKAN 2014 (24)	KAYSERİ	Family physicians N=143/280 Response-rate: % 51,1	16,1±7,2	4,3±3,2	21,0±3,7	ND	3
A.ARAS 2012 (25)	ERZURUM	Practitioner physicians N=246/253 Response-rate: % 97	17.1±7.5	5.8±3.8	20.±4.3	ND	1
İ.TOKER 2015 (26)	NATIONWIDE	Emergency room resident N=160/410 Response-rate: % 40.7	21.3±6.4	10.2±3.9	19.8±3.9	ND	2
O.TAYCAN 2013 (27)	MUŞ	All-physicians N=139/207 Response-rate: %71.2	14.9±7.02	5.8±3.3	20.3±3.8	ND	3
C.SÖNMEZ 2018 (28)	DÜZCE	Resident physicians N=89/152 Response-rate: %58,5	27,7±7,8	12,7±4,1	27,6±5,0	ND	1
O.HURŞİTOĞ LU 2019 (29)	K.MARAŞ	Resident physicians N=147/156 Response-rate: % 94	19.4	7.5	21.1	ND	2
M. ATİK 2019 (30)	NATIONWIDE	Chest-respiratory physicians N= Response-rate: ?	11	7	20	ND	3
S.ÜNAL 2001 (31)	MALATYA	All-physicians N=384/593 Response-rate: % 64	14.0±6.0	5.3±3.1	20.5±4.2	ND	2
S.U. TANGUL 2018 (32)	NATIONWIDE	Paediatric surgery N=98/176 Response-rate: %55 Non-paediatric surgery N=97/193 Response-rate: % 50	19.8±6.8 15.3±6.3	7,2±3,8 5.3±3.5	11.3±4.4 10.3±3.7	ND	2

S.ERSOY 2011 (33)	ANKARA	Emergency room Resident N=206/? Response- rate: %? State Hospital Univer. Hospital	27.5 ±5,4 24,6 ±5. 6	15,5±3,4 13.3±3,8	26.3±4.7 27.0±4.4	ND	2
A.EROL 2006 (34)	ANKARA	Resident physicians N=117/135 Response-rate: %86 male female	20.4±1.04 19.1±0.92	8.6±0.6 6.7±0.6	19.0±0.6 18.9±0.8	ND	2
A.YILMAZ 2018 (35)	DİYARBAKIR	Family physicians N=343/? Response- rate: % ?	16,7±7,3	5,6±4,1	20.3±5,4	ND	3
H.T. YASAR 2020 (36)	ORDU	All-physicians N=310/? Response- rate: ? %	21,3±7,0 %79	7,9±3,4	20.1±3,7	ND	4
M.S. BOLAT 2019 (37)	NATIONWIDE	Urology physicians N=369/2000 Response-rate: % 18	16,8± 8,7	6 ±4,6	8,2±5,6	ND	2
Y.Ç.ABUT 2012 (38)	ISTANBUL	Anaesthesiology resident N=157/159 Response-rate: %98.7 male female	19,3±5,8 20.4±0.9	7,4±4,4 6,1±3,9	21.0±5,4 22,7±4,8	ND	2
B.METE 2020 (39)	BİNGÖL	All-physicians N=119/150 Response-rate: %79 male female	21,0±7,5 24,2±7,5	7,2±4,4 7,5±4,7	22,0±5,0 20,4±4,2	ND	3
H.CAN 2020 (40)	İZMİR	Resident physicians N=165 /? Response-rate: %? Non-Surgery low moderate high Surgery low moderate high	9,4% 12,5 % 15,3% 37,5 % 75,3% 50,0%	11,8% 15,0 % 24,7% 20,0% 63,5% 65,0%	11,8% 8,8 % 30,6% 33,8% 57,6% 57,5%	ND	2
B.SERİK 2016 (41)	SAKARYA	Family physicians N=157/258 Response-rate: % 60.8	17.5±7,1	5.4±3.4	21.1±3,9	ND	1
A.ÖZYURT 2006 (42)	ISTANBUL	All-physicians N=598/768 Response-rate: %78 male female	13,3±6,3 13,5±6	4,6±3,4 4± 3,2	22.6±4.4 22.6±3.9	ND	4
R.ALGÜL 2016 (43)	ISTANBUL	All-physicians N=79/88 Response- rate: %89 Non-Surgery Surgery	12.8±6.8 13.1±5.9	7.4±3 7.4±2.9	8.7±3.2 9.5±3.6	ND	3
A.D.ESEN 2015 (44)	ISTANBUL	Family physician resident N=46/? Response-rate: % ?	22.2±5.6	21.4±5.5	30.9±4.9	ND	1

H.YAMAN 1998 (45)	ANKARA	Family physician resident N=91/135 Response-rate: % 67	16.7 ±7.4	9.9±5.6	26.1± 7.4	ND	2
H. ASLAN 1996 (46)	ADANA	Practitioner physician N=101/? Response-rate: % ?	15.4±5,9	5,2±3,1	21,3±3,9	ND	2
M.N. İLHAN 2005 (47)	ANKARA	Resident physicians N=416/452 Response-rate: %96 Laboratory Non-Surgery Surgery.	15.6 ±6.2 16.8±6.0 17.0 ±6.3	5.6±3.99 6.3 ±3.59 7.1±3.5	18.3±5.2 19.1±4.0 20.2 ±3.6	ND	4
M.ALI KURÇER 2005 (48)	URFA	All-physicians working in a university hospital N=135/216 Response-rate: %62.5 low moderate high	17.4±0,6 80,3% 8,9% 9,1%	6.8±0,3 63,7% 27% 9,3%	20.7±0,4 67,8% 22,1% 8,3%	ND	2
N.HAVLE 2008 (49)	İSTANBUL	Physiatry physicians N=226/? Response- rate: % ?	18.8±6.3	5.4±3.6	21.4±4.8	ND	3
J.C.SÖLER 2008 (50) M. UNGAN	12 EUROPEAN COUNTRIES TURKEY SECTION	Family physician N=1393/3500 Response-rate: %39 Family physician N=112/500 Response-rate: % 22.4	43% 15.2%	15.2% 35%	32 % 69.4%	12%	4
E.ÇAN 2006 (51)	TRABZON	Resident physicians N=192/215 Response-rate: %89.3 Non-Surgery male female Surgery male female	12.3±3.4 11.6±4.9 8.5±5.7 12.3±7.9	5.1±3.3 5.1±3.3 11.0±5.0 10.9±6.4	12.3±3,4 11.6±4.9 12.3±3.4 13.1±5.	ND	3
S.BEYHAN 2013 (52)	ADANA	Anaesthesiology physicians N=87/? Response-rate: ?	15,5±6.1	5,3±3,0	9,2±3,4	ND	2
M.BIRCAN 2005 (53)	KONYA KARAMAN AKSARAY	Physicians working in emergency room and ambulance N= 246 /? Response- rate: ?	16,5±6.7	6,3±3,8	21,9±3,8	ND	2
K. MARAĞOĞLU 2019 (54)	KONYA	Resident physicians and academic physicians N= 894/978 Response- rate: % 91	16.4±7.80	6.2±3.9	20.3±4.6	ND	4

G.ÖZKULA 2014 (55)	ANKARA	All-physicians working in a university hospital N=258/480 Response-rate:%53 male female	22.7±8.1 24.0±7.2	14.5±4.1 13.7±4.0	30.0±5.0 29.9±4.6	ND	3
G.ÖZTÜRK 2012 (56)	ANKARA	Physicians attending to the army N=215/? Response- rate: % ?	21,8±5,3	9,6±3,1	17,3±3,9	ND	3
K. MARAĞOĞLU 2013 (57)	KONYA	Resident physicians N=160/200 Response-rate: % 80	17.7±7.2	6.7±3.6	20.1±4.3	ND	3
E. DİKMETAŞ 2009 (58)	SAMSUN	Resident physicians N=270/510 Response-rate: % 52,9	2,9/5	2,9/5	2,9/5	ND	2
Ö. GÖCEN 2018 (59)	DIYARBAKIR	Resident physicians N= ? /200 Response-rate: ?	31,5±11,6	11,7±6,4	29,4±7,7	ND	4
R.DABAK 2007 (60)	ISTANBUL	Resident physicians N=52/? Response- rate: ? high moderate low	%67.3 %32.6 0	%51.9 %48.08 0	%63.4 %17.3 %19.2	ND	2
D. ASLAN 2005 (61)	NATIONWIDE	All-physicians N=1754/? Response-rate % ?	15.4±6,7	5.5±3,5	22.0±4.0	ND	4
R. BUĞDAYCI 2003 (62)	MERSİN	All-physicians N=455/500 Response-rate:%91 male female	12,7±6,1 12,6±5,5	4,1±3,2 4,1±3,0	23,2±4,8 22,5±4,1	ND	4
N.Ç.ÖRAY 2013 (63)	İZMİR	Resident physicians N=189/523 Response-rate: % 36	19,1±8,3	18,9±7,7	24,3±6,2	ND	2

## Discussion

In this part of the article, most extreme values determined included in the studies will firstly be discussed regarding the meanings of, the causes of and the possible consequences of. Following, Turkish physician's burnout prevalence based on the calculated mean values will be presented in comparison with the values reported from other countries. Each parameter in relationship with burnout has been reported in the results section, and will be discussed in the next step, to reveal the exact or the closest to exact situation about accompanying factors of burnout by comparing meta-analyses' findings in the international literature if it exists, if not, by comparing the findings of the studies with high

definition power depending on the design, sample size and the statistical method used. Later, the limitations of the included studies will be discussed and some suggestions will be put forward to avoid the limitations in future studies. The highest EE scores were determined in the study of Ersoy (34) which evaluated emergency medicine assistants in Ankara in 2011, and in the study of Sonmez (28) in Düzce in 2018, which included assistant physicians regardless of their branch. In both studies, the limited number of residents who were subject to heavy, long working and training hours were evaluated, and in one of them only emergency medical assistants working in a department which is in the most difficult areas to manage chronic workplace stress were included, and may explain the high points. In addition, there was found to be higher burnout levels in young physicians in many

previous studies. Assistant physicians are a relatively young population. But interestingly, contradicting these findings and explanations, the lowest EE score was determined in the 4th year assistant physician group in the study of Turgut (21) in 2016, in which he evaluated the assistants in Istanbul. How should it be discussed that while the highest and the lowest EE score was determined in the three assistant physician studies which did not show a significant difference in terms of sample size, average age, gender distribution and statistical methods used? Perhaps the 4th year assistants answered the questionnaires with the optimism of it being the end of hard work and training period and / or living in a metropolis of Istanbul, the feeling of being in the center may also have created a certain optimism. However, it should be borne in mind that may be an accidental finding. The highest DP scores were determined in two (18, 33) studies conducted on small samples that would cause us to approach these extreme values with suspicion. The lowest DP score was reported by Baykan (24) among family physicians in Kayseri in 2014. This value is less suspicious as it is very close to the values reported in other studies involving family physicians, general practitioners and all physicians in Table 1. The highest PA scores were in the study of Anil (22) where he evaluated paediatric assistant physicians in İzmir in 2017, and Turgut's study (21) conducted among assistant physicians in the second year of the assistant group, in Istanbul in 2016. The extreme PA points may reflect the reality depending on 1) the close memory of assistant physicians' passing a challenging selection exam such as TUS, 2) living in centers such as Izmir or Istanbul, and 3) PA is the last parameter affected by the development process of professional burnout. The lowest PA score was also in Erol's study (34) which included assistant physicians in Ankara in 2006, overshadowing the arguments speculated above. However, the value was only in the female assistant physicians group causing weakness of the overall representation power.

The calculated mean values of means, representing the total universe evaluated in all studies, were 18.3 for EE, 7.9 for DP and 20.1 for PA, respectively. According to the low, medium and high cut-off values determined by Ergin et al. (8) for each burnout subcomponent, there is low burnout in EE and in DP, while the score in the PA subscale reflects high burnout. Burnout values reported from many countries are expressed in subscales and the overall burnout rate as a percentage. The situation makes it difficult for us to discuss the physician burnout in our country in comparison with the prevalence of physician burnout in the world. Portuguese (64) anaesthesiologists were evaluated in a study; EE was reported as 57% and DP 91%. In contrast, Spanish (65) anaesthesiologists reported an overall burnout rate of 13%. In the Netherlands (66), the overall burnout rate for anaesthesiologists was 18%. In Spain (68), overall burnout among family physicians is 35% was reported. In a study conducted on a group of approximately 500 Hungarian (69) family physicians, there were scores of 30% EE, 60% DP and 80% a low PA score. In Switzerland (70), moderate or high burnout is defined in 1/3 of approximately 1,800 family physicians. Another study conducted in Switzerland (71) to compare

burnout syndrome prevalence among oncologists, paediatricians and family physicians, EE was detected in 33% of all groups examined. In 2008, in a study (50) covering nearly 1,400 family physicians from 12 European countries including Turkey, of the physicians studied, 43% reported high EE, 35% high DP and 32% low PA. Only one third of the physicians did not exhibit any sub-dimension of burnout. High and moderate burnout syndrome was detected in 80% of Polish (72) radiologists. High degrees of EE were also reported among Italian (73) psychiatrists. In New Zealand (74), two-thirds of psychiatrists exhibited moderate or high EE and low PA. The prevalence of burnout syndrome among Brazilian (75) oncologists was reported as 69%. In a group of American (76) oncologists the rate of burnout was 36%. The rate of burnout was 35% of gynaecological oncologists in Australia (77) and a high degree of EE was shown in about 50% of them who had considered a job change in the past 6 months. A study (78) conducted in a group of 7,715 oncologists in the USA found significant burnout in 60% of physicians. Of orthopaedics and trauma surgeons in Saudi Arabia (79) 50 % had high EE and DP. In a study among primary care physicians in the UK (80), it was found as 46% EE, 42% DP and 34% PA. In the UK (81), in a study covering more than 500 surgeons, one third were exhausted and it was determined that most of them were thinking of early retirement without waiting for the age. In a systematic review (82) of 182 studies involving 109 628 physicians from 45 countries found considerable variability in published prevalence of burnout that ranged from 0% to 80.5% and it was also found to have at least 142 different definitions to meet the total burnout or burnout subscale criteria. So, there was no consensus on burnout evaluation. It was emphasized that the heterogeneity among the studies evaluated was at a level that would make it question whether any prediction of prevalence for burnout could be interpreted meaningfully. As seen, both from our country and from other countries, physician burnout figures are quite heterogeneous. As it changes in country, region and branch, the heterogeneity increases which makes it impossible to compare and discuss.

In physician burnout studies in Turkey, including our review, many potential accompanying factors with burnout divided into three basic groups as demographic-individual, organisational and occupational factors, were analyzed. When gender, one of the demographic-individual factors, was evaluated in terms of burnout in Turkish physicians, EE was found to be higher in female physicians in five studies, DP higher in male physicians in six studies and PA lower in female physicians in four studies. In other studies, gender was evaluated as unrelated to burnout. Similarly, while gender is not an independent determinant of burnout in many studies in the international literature, it has been reported that female physicians have 20-60% higher burnout rates than men in some studies (83). In a Norwegian study (84) examining risk factors for physician burnout, higher levels of burnout were found in female physicians and it was discussed as possible work-home conflict. A study examining differences in burnout and career satisfaction between male and female surgeons in

the US (85), including 7,858 surgeons, and found that 43% of women experienced burnout compared to 39% of men. Although the low response rate (32%) caused a potential bias, the relatively large sample combined with rigorous statistical analysis including logistic regression reinforces the validity of this study. In another study including 7,197 surgeons across the USA (86), burnout was found to be significantly higher in female physicians. In contrast, in a European (50) study burnout was reported to be more common among men. However, in this study, the sample size was smaller than in US studies. In addition, the questionnaire was translated into many languages, but they did not use a professional translator service, instead they relied on family physicians who coordinated the work to translate MBI into their native language. This raises great doubts about the accuracy and consistency of the translation. In the light of all above information, we can say that gender does not have a definite and clear effect on occupational burnout as an independent variable. Yet, female physicians appear to be at higher risk in terms of EE and PA subscales, and the DP dimension may be more prominent in males. The issue of age is also controversial in its relationship to burnout, as is gender. Initially, burnout was thought to be a late career phenomenon, but in recent studies it has begun to be reported more frequently that younger physicians have a higher risk of burnout than their older colleagues (87). In a study included in our review, the average PA score of physicians over 40 years was found to be lower than physicians under 29, supporting the late career phenomenon claim. However, fifteen studies that found a relation between aging and professional burnout reported that the risk of burnout decreases as age increases. Nine studies found no relation between age and burnout. One US study (86) found that the risk of burnout decreases with increasing age. A cross-sectional multicenter European study (50) showed a significant association between age or years of graduation and burnout, in that increasing age and years of post-graduation decreased burnout. In another study (88), no significant relationship was found between burnout and age. However, the participants in this study were predominantly consulting physicians, with only 4% under the age of 39, which makes the study less representative for age. As a result, we can say that the risk of burnout decreases with increasing age and experience, and generally, the evidence shows that burnout is more common among young doctors. The twelve studies evaluated in this review, found a relation in burnout with marital status, while it was reported unrelated in thirteen studies. The status and number of children were evaluated to be related to burnout in three studies, and unrelated in five studies. In a systematic review (89) conducted in the UK, being single was associated with burnout in six studies, but not in one study. Having children was associated with less burnout. In a study by Woodside and colleagues (90), conducted among psychiatry and family medicine residents, residents with children had lower burnout scores than childless residents, regardless of gender. This was in line with the relatively large international study of Jovanović and colleagues (91) that found that

severe burnout was 44% higher in psychiatric residents without children compared to those with children. However, Martini and colleagues (92) found no relation between marital or parental status and burnout. Jugale (93), Shetty (94) and Sreelatha (95) found that unmarried people were more likely to have burnout. According to all those findings, we can think that being married with children provides social support and has a protective effect on burnout. However, some studies (96) have shown that being married and having children (more prominently in female physicians) increases burnout, and a possible interpretation for this situation is home-work or work-home conflict due to the difficulty of coping with other tasks while being subjected to a significant workload. For example, in a review of 47 articles (97), home-work conflict was a common theme affecting the burnout rate. A study involving surgeons in the USA (85) found that 62% of women experienced a job-house conflict in the last three weeks compared to 49% of men, and higher rates of burnout were found in women who experienced work-home conflict. Work-home conflict has been identified as an independent risk factor for burnout, especially among female surgeons. The US team conducting this study expanded the hypothesis to other specialties of the non-surgical discipline with a design that included 465 internal medicine doctors to validate the importance of work-home conflict. In this study (98), physicians who experienced work-home conflict in the last three weeks had a higher rate of reporting symptoms of EE or DP. In a cross-sectional study (99) in which 3,196 physicians in France were evaluated, it was calculated that work-family conflict increased the risk of burnout four times. In the studies included in our review; existence of hobbies, time allocated to hobbies, frequency of social activities and time allocated, reading non-medical books, going on regular vacations, doing regular sports, having leisure time, having good and sufficient time with family, supportive social environment, and not feeling lonely were found to lower burnout rates. Only two studies that evaluated one or more of these factors showed un-relation to burnout. In a study evaluating the relationship between American surgeons' living habits and burnout (86), regular exercise was associated with a lower risk of burnout. Also, surgeons who reported high levels of participation in personal health strategies (such as going on vacation and having a positive attitude) had a lower risk of burnout. Although it is thought that physicians who participate in these health strategy programs and pay more attention to their personal health have a reduced risk of burnout, these results may also be a manifestation of selection bias, i.e. there are personality organizations who are geared towards reducing the risk of such individuals' lifelong suffering, and the relationship described in this regard may be entirely due to this situation. Lefebvre (100) reported that regular exercise is associated with a reduction in burnout in residents. In a review of psychiatric residents (101), the absence of extra-curricular social activities and hobbies was associated with higher levels of burnout. In our review, neurotic personality traits, self-confidence, problem or emotion-oriented solutions and management strategies, mature or immature psychological defence mechanisms,

depression-anxiety levels, history of antidepressant use, sleep time and irregularity, love of the profession and the chosen branch, satisfaction with the profession, and effective factors in the career selection process etc, was associated with burnout in eighteen studies, while it was unrelated in two studies. In the international literature, career satisfaction was found to involve less burnout in those who had self choice of profession and who wanted their children to turn to the same career, while the desire to leave the profession before retirement was found to be associated with higher burnout (96,97). Ripp et al. (102) reported that physicians who described themselves as anxious, disorganized, or less calm had significantly higher burnout rates. Similarly, Eckleberry-Hunt et al. (103), in a study involving physicians from 13 different specialties, found that personality traits such as pessimism and perfectionism, lack of coping skills, lack of autonomy, inability to cope with time pressure, and poor relationships with colleagues increased burnout. In the same study, the use of prescription antidepressants or anti-anxiety medication was associated with a lower risk of burnout. Shapiro et al. (104), on the other hand, reported that burnout and loneliness were related in a dose-dependent manner. In most studies in which depression, anxiety, and post-traumatic stress disorder were evaluated with specific scales, it was shown that all three conditions were associated with burnout (105). Extraversion, compliance, conscientiousness, and openness are associated with lower levels of burnout, while neuroticism is linked to higher burnout (104). Increasing self-efficacy levels are associated with low levels of burnout (96). In a study based on self-reporting, chronic insomnia (98), and suffering from sleep disorders were associated with burnout. In this review, the presence of a diagnosed chronic disease was considered to be associated with burnout in three studies, and unrelated in four. In some international publications, higher burnout points were found in those with illness and related work attendance problems (100). In addition, those who reported lower physical and social quality of life also reported higher burnout, while those who reported high physical capacity and good general health condition were found with lower burnout (86). Working environment with low risk of work accident or occupational disease, low stress and time pressure, harmonious, non-discriminatory, easily accessible consultant and manager-assistance was found to be associated with low burnout scores in 11 studies included in our review. Poor working relationships and conflict between colleagues were found to be associated with higher burnout scores. Similarly, in the international literature, it has been emphasized that prioritizing appropriate feedback and supportive attitudes towards colleagues who perform poorly in the work environment is associated with lower burnout, while environments with lack of administrative support, which prioritize embarrassment by confronting mistakes and a culture of bullying to crush, are associated with higher burnout. A multi-specialty study showed that increased sense of belonging to the institution or team was associated with lower burnout. Also, surgeons who had access to mentoring had lower burnout levels (94, 96, 101). Alcohol was considered to be related with burnout

in four studies included in our review, and unrelated in five studies. Smoking was deemed to be associated with burnout in nine studies and unrelated in three studies. In the international literature, physicians with a history of substance abuse (including smoking and alcohol) had a higher risk of burnout (97). Monthly income level was deemed to be related with burnout in nine studies and unrelated in six studies included in our review. In the international literature, lower income is also associated with higher levels of burnout. A study of orthopaedic assistants showed that debt burden and financial concerns were associated with higher burnout. Conversely, two small studies in Fiji and Saudi Arabia found that income did not make a difference in burnout levels (79,106). Estry-Behar et al. in a study (99) in which they evaluated emergency physicians in terms of job satisfaction, showed that doctors who stated that their earnings were insufficient had a higher burnout risk. Another study (99) conducted in France showed that physicians who found their earnings insufficient were more likely to suffer from burnout. In the eighteen studies included in our review, weekly working hours, shift working, number of night shifts, number of patients cared for per day were considered to be related to burnout, whereas in six studies it was unrelated. Studies in the international literature also show that burnout is generally associated with increased workload and long working hours. Self-report criteria were used in most studies to determine the working hours. In a review article, four studies independently associated long working hours with burnout, while two studies reported that a correlation was detected in univariate analysis, but this relationship was not verified in multivariate analysis. In two longitudinal studies that were the subject of the same review article, a significant decrease was found in burnout scores after the adjustment of shortening in working hours. No correlation was found between working hours and burnout in eight studies included in the same review article (89). Al-Dubai and Rampal (107) found a significant relationship between the prevalence of burnout in physicians and long working hours (working over 40 hours per week). The findings of Stodel and Stewart-Smith (108) supported this hypothesis. They showed that long working hours were the third most common cause of burnout and accounted for 16% of cases, whereas workload was the most important cause and accounted for 26% of cases. A study involving general practitioners, paediatricians, and cancer physicians in Switzerland (71) showed that physicians working more than 50 hours per week had a higher risk of having burnout. A study evaluating hospital consultant physicians in New Zealand (74) revealed that consultants who work long hours are at increased risk of burnout. In the studies included in our review the following factors; hospital, unit, branch, academic staff, and whether or not to undertake responsibilities as a manager, were evaluated in terms of relation to the burnout. It was found related in twenty four studies while it was found unrelated in eight studies. In some publications in the international literature, academic and research studies have been found to be protective against burnout (89, 90, 92, 96-99,101,103). In one study, working as a clinician or as research staff did not make a difference regarding burnout (107). In terms of branches

and units; in a sample of 7,288 physicians, the highest burnout rates were found to be 52% in emergency room physicians and 50% in intensive care physicians, while the lowest burnout rates are still very high in 33% of psychiatrists and 32% of pathologists (12). The history of physical and/or verbal violence was evaluated in the five studies included in our review, and it was associated with burnout in all of them. The malpractice case story was the subject of a study and it was found not related to EE, but related to DP. Similarly, conflict with patients and high patient expectations are associated with burnout in the international literature. Being accused of wrong treatment is associated with higher burnout in neurosurgeons. Medical errors have been shown to be independently associated with burnout in a large and multi-disciplinary study and in a smaller study involving only orthopaedic-trauma surgeons. A similar correlation has been found in plastic surgeons (96-99).

It is important to note that although the factors associated with burnout have been discussed individually and independently, they may actually be interrelated. For example, age and working hours may be linked through work environments governed by established coercive traditions in teaching hospitals, where young physicians are faced with more pressure to increase their knowledge and skills through practice. In addition, lack of experience can increase the time it takes to complete tasks and thus increase working hours.

This article is the most comprehensive example of its kind in the national literature with its scope, which uses studies that describe burnout rates and related factors in physicians in our country with different specialties and degrees, and tries to analyze these findings in comparison with international literature data. However, there are some important limitations worth highlighting. The vast majority of the literature reviewed consists of cross-sectional studies using questionnaires sent to participants online or by mail. In some, the number of participants, in others the response rate, is low enough to make the results questionable. In some study reports, the response rate is not specified. Most of the studies made no effort or no explanation in the report to increase the response rate by sending reminders or repeating questionnaires. Unresponsiveness or bias may have affected the results. That is, those who already suffer from burnout and are interested in the topic are more likely to have completed questionnaires. On the other hand, it is possible that others did not complete the questionnaire due to burnout. Although cross-sectional survey studies are useful in enabling the examination of very large samples, they make it difficult to confirm the existence of a cause-effect relationship. An example of this is the relationship between low job satisfaction and burnout. While researchers suggest that low job satisfaction is a risk factor for burnout, it is possible that burnout is a risk factor for low job satisfaction, or drop satisfaction itself is a symptom of burnout. The same is true for the relationship between burnout and work-home conflict. In addition, although the most frequently used scale is MBI, the usage of a modified or a shortened version of the scale makes it

difficult to evaluate both collectively and comparatively with the findings of the literature. The fact that the percentage values are not included in the research reports, result in the same difficulty. In studies to be conducted in our country in the future it is preferred they use the MBI and the translation and validity study to be conducted by Ergin (8), and the prevalence of burnout must be expressed in the subscales and the overall burnout as percentage. In this regard, it will mediate a unity of understanding and terminology. The choice of research techniques that will reveal the causal-effect relationship more clearly and reliably than cross-sectional studies will be the basis for determining the factors associated with burnout.

Although it is very difficult to reach reliable or definitive conclusions, we can say that there is a low level of EE, a low level of DP and a high decrease in the sense of PA in physicians working in our country. The overall burnout reported by those is not very high, but also is not very low. When the many factors were reviewed in terms of the relationship with burnout, many contradictory findings were encountered. Yet, we can say that female physicians appear to be at higher risk for EE sub-dimension, and the risk of burnout is reduced with increasing age or experience. There is an urgent need to conduct studies in large samples representing the physician population throughout the country to define burnout prevalence and accompanying factors, especially reversible ones for design of certain intervention program of physician burnout.

## References

1. Lacy B E, Chan JL. Physician Burnout: The Hidden Health Care Crisis Clinical Gastroenterology and Hepatology 2018; 16.311--317
2. Greene, Graham (1961). A Burnt-Out Case. William Heinemann Ltd. pp. cover title.
3. Freudenberger, H.J. (1974). Staff burnout. Journal of Social Issues. 30: 159--165.
4. Maslach C. Jackson S. Maslach Burnout Inventory manual. 2nd ed.1986 Consulting Psychological PressPalo Alto, CA
5. Vahia, Vihang N. Diagnostic and statistical manual of mental disorders 5: A quick glance. Indian Journal of Psychiatry. 2013; 55 (3). 220--223.
6. ICD-10: International Classification of Diseases, Z73. Geneva: World Health Organization, 2015.
7. WHO releases new International Classification of Diseases. ICD 11
8. Ergin C. Burnout in Doctors and Nurses and Adaptation of Maslach Burnout Scale. VII. Scientific Studies of the National Psychology Congress. Publication of the Turkish Psychological Association, Ankara, Pages143-154.
9. Demirel Y, Güler N, Toktamis A, Özdemir D, Sezer R.E. Burnout among high school teachers in Turkey. Middle East Journal of Family Medicine, 2005; 13(3)33
10. Balch CM, Shanafelt TD. Combating stress and burnout in surgical practice: a review. Adv Surg 2010; 44.29--47.
11. Shanafelt TD, Hasan O, Dyrbye LN. Changes in burnout and satisfaction with work-life balance in physicians and

- the general US working population between 2011 and 2014. *Mayo Clin Proc* 2015; 90:1600-1613.
12. Dyrbye L.N, Varkey P, Boone S.L. Physician satisfaction and burnout at different career stages. *Mayo Clin Proc* 2013; 88: 1358-1367.
13. Shanafelt T.D, Boone S, Tan L. Burnout and satisfaction with work-life balance among US physicians relative to the general US population. *Arch Intern Med* 2012; 172: 1377-1385
14. Medscape Physician Lifestyle report. <http://www.medscape.com/sites/public/lifestyle/2013>
15. Yazgan AD, Durusu TM, Unal S. Burnout syndrome during residency in internal medicine and paediatrics in a country without working time directive *International Journal of Health Care* 2014; 27 (3). 223-230
16. Erdur B, Ergin A, Yüksel A, Assessment of the relation of violence and burnout among physicians working in the emergency departments in Turkey. *Ulus Travma Acil Cerrahi Derg*, 2015; 21 (3).
17. Gül A, Gül H, Özkal UC, Kincir Z, Gültekin G, Emul HM. The relationship between sluggish cognitive tempo and burnout symptoms in psychiatrists with different therapeutic approaches. *Psychiatry Res.* 2017; 252: 284288.
18. Karaoglu N, Pekcan S, Durduran Y, Mergen H, Odabasi D, Ors R. A sample of paediatric residents' loneliness anxiety-depression-burnout and job satisfaction with probable affecting factors. *J Pak Med Assoc.* 2015; 65 (2): 183-191.
19. Kosan Z, Calikoglu EO, Guraksin A. Levels of burnout and their associated factors among physicians working in Northeast Anatolia. *Niger J Clin Pract.* 2018; 21 (7): 875881.
20. Piriñçi E, Durmuş B, Gündoğdu C, Açık Y. Prevalence and risk factors of overweight and obesity among urban school children in Elazig city, Eastern Turkey. *Ann Hum Biol.* 2010; 37 (1): 44-56.
21. Turgut N, Karacalar S, Polat C, et al. Burnout Syndrome During Residency. *Turk J Anaesthesiol Reanim.* 2016; 44 (5): 258-264.
22. Anıl M, Yurtseven A, Yurtseven İ. The evaluation of burnout and job satisfaction levels in residents of pediatrics. *Turk Pediatri Ars.* 2017; 52 (2): 66-71.
23. Sünter AT, Canbaz S, Dabak Ş. Burnout, work-related tension and job satisfaction levels in general practitioners. *General Medical Journal.* 2006; 16 (1): 9-14
24. Baykan Z, Çetinkaya F, Naçar M, Kaya A, Işıldak Ü. Burnout of family physicians and related factors *Türk Aile Hek Journal* 2014; 18 (3): 122-133
25. Aras A, Guraksin A, Kosan Z. Burnout syndrome, job satisfaction and associated factors among primary health care doctors in Erzurum. *Turkey Journal of Surgery and Medicine.* 2018: 2
26. Toker İ, Ayrik C, Bozkurt S. Factors Affecting Burnout and Job Satisfaction in Turkish Emergency Medicine Residents. *Emerg Med Open J.* 1 (3), 64-71
27. Taycan O, Taycan SE, Celik C. Relationship of burnout with personality, alexithymia, and coping behaviors among physicians in a semiurban and rural area in Turkey. *Arch Environ Occup Health.* 2014; 69 (3): 159-166.
28. Sönmez CI, Ayhan BD, Gülmez H. Determination of burnout level and related factors in Düzce University Faculty of Medicine residents. *Euras J Fam Med* 2018; 7 (3): 93-100.
29. Hursitoglu O, Findikli E, Saglam F, Doganer A. Resident Burnout may be correlated with immature and neurotic ego defenses in a sample from Turkey. *Psychiatry and Behavioral Sciences* 2019; 9 (3): 69-77.
30. Atik M, Uçan ES, Ellidokuz H, Alptekin K. Burnout in chest physicians after health care reforms: A Cross-sectional study in Turkey. *Turk Thorac J.* 2019; 20 (1): 1824.
31. Ünal S, Karlıdağ R, Yoloğlu, S. Relationships between burnout, job satisfaction and life satisfaction in physicians *J Clin Psy.* 2001; 4 (2): 113-118
32. Tanguil SU, Hacimusalar Y, Karaaslan O. The effects of working hours on sleep quality and burnout in Turkish pediatric surgeons. *Indian Journal of Surgery.* 2020; 82 (2): 176--181
33. Ersoy S, Kavalcı C, Yel C, Yılmaz F, Kavalcı G, Aslan Ö. Comparison of Burnout Levels of Emergency Medical Assistants Working in Faculty of Medicine Hospitals and Ministry of Health Training and Research Hospitals. *Ankara Medical Journal.* 2014; 14
34. Erol A, Sarıçiçek A, Gülseren Ş. Burnout in resident physicians: its relationship with job satisfaction and depression. *Anatolian Journal of Psychiatry.* 2007 8: 241247.
35. Yılmaz A. Burnout, job satisfaction, and anxiety depression among family physicians: A cross-sectional study. *J Fam Med Prim Care* 2018; 7 (5): 952-956.
36. Hacer TY, Ali A. Burnout in physicians who are exposed to workplace violence *J Forensic Leg Med.* 2020; (69) 101874
37. Bolat Et Al. The prevalence of burnout syndrome among Turkish urologists: Results of a nationwide survey. *Turkish Journal of Urology.* 2019; 45:449-456.
38. Abut YC, Kitapcioglu D, Erkalp K, Toprak N, Boztepe A, Sivrikaya U. Job burnout in 159 anaesthesiology trainees. *Saudi J Anaesth.* 2012; 6 (1): 46--51.
39. Mete B, Sait MD, Pehlivan E. Relationship between physicians' occupational burnout syndrome and working quality of life. *Anatolian Clinic Journal of Medical Sciences,* 2020; 25 (2)
40. Can H, Güçlü AY, Doğan S. Burnout syndrome in resident physicians in surgical and non-surgical clinics. *Tepecik Educ Hast Magazine* 2010; 20 (1): 33-40 33
41. Şerik B, Erdoğan N, Ekerbiçer HÇ, Demirbaş M, İnci MB, Bedir N, Karatepe TU, Erkorkmaz Ü. Burnout levels of family physicians working in family health centers in Sakarya and related factors. *Sakarya Medical Journal.* 2016; 6 (2) -.76-92
42. Ozyurt A, Hayran O, Sur H. Predictors of burnout and job satisfaction among Turkish physicians. *QJM.* 2006; 99 (3): 161-169.
43. Algül R, Yılmaz D, Özer Ü, Kaya B. Variables affecting burnout levels among medical doctors working in internal and surgical branches and the relationship of burnout with work engagement and organizational commitment. *J Clin Psy.* 2016; 19 (4): 176-184

44. Esen A, Mercan G, Kaçar E.. Burnout syndrome and job satisfaction levels in family medicine residents. *The Anatolian Journal of Family Medicine*. 2018; 1. 34-36
45. Yaman H, Ungan M. Burnout: A review on family medicine residents. *Turkish Journal of Psychology*. 2002; 17 (49): 37-44
46. Arslan H, Unal M, Arslan O. Depletion levels in general practitioners. *The Thinking Man*. 1996; 9 (3) 48-52 48
47. İlhan H, Üzün R, Mustafa N. Directing the mirror to yourself: The relationship between burnout syndrome and the variables related to personal characteristics and working conditions in a medical school research assistants. *Community and Physician*. 2005; 20 (6)
48. Kurçer MA. Job satisfaction and burnout levels of physicians working Harran University Faculty Of Medicine in Şanlıurfa. *Harran University Medical Faculty Journal* 2005; 2 (3): 10-15
49. Havle, İlnem, Yener, Gümüş. The man who considers burnout, job satisfaction and their relationship with various variables in psychiatrists working in Istanbul; 2008, 21 (1-4): 4-13
50. Soler JK, Yaman H, Esteva M. Burnout in European family doctors: the EGPRN study. *Fam Pract*. 2008; 25 (4): 245-265.
51. Çan E, Topbaşı M, Yavuzylmaz A, Çan G. Burnout syndrome and job satisfaction levels of research assistant physicians at Karadeniz Technical University Faculty of Medicine and related factors. *O.M.Ü. Medical Journal* 23 (1): 17--24, 2006
52. Beyhan S, Güneş Y, Türktan M, Özcengiz D. Investigation of burnout syndrome in anesthesiologists in the eastern Mediterranean region *Turk J Anaesth Reanim* 2013; 41: 7-13
53. Bircan M, Ak A, Bayrak D. Burnout syndrome in physicians providing emergency medicine. *Eurasian J Emerg Med* 2006; 5: 51-54
54. Armutlukuyu M, Marakoğlu K, Kargın NÇ. Evaluation of burnout levels among faculty members and research assistants working in medical faculties *Euras J Fam Med* 2019; 8 (1): 10-18.
55. Özkula G, Durukan E. Physician burnout syndrome: role of sociodemographic characteristics. *Dusunen Adam (Journal of psychiatry and neurological sciences)*. 2017; 30 (2), 136-144.
56. Öztürk G, Cetin M, Yıldırım N, Türk YZ, Fedai T. Burnout and job satisfaction levels in physicians. *Anatolian Journal of Clinical Investigation*. 2012; 6 (4). 239-245.
57. Marakoğlu, K, Çetin KN, Armutlukuyu M. Evaluation of burnout syndrome and related factors in medical faculty research assistants. *Journal of General Type*. 2013; 23 (4) .103–108.
58. Dikmetaş E, Top M, Ergin G. Investigation of Burnout and Mobbing Levels of Assistant Physicians *Turkish Journal of Psychiatry* 2011; 22
59. Göçen Ö, Yılmaz A, Aslanhan H, Celepkolu T, Tuncay S, Diican E. Physicians' knowledge and attitudes about defensive medicine practices, work-related tension and burnout levels. *Turkish Journal of Family Medicine and Primary Care*. 2018; 12 (2), 77-87.
60. Orbay İE, Sargın TM, Özçınar M, Dabak R. Burnout syndrome in resident doctors. *Turkey Journal of Family Practice* 2007; 11 (2): 67-71
61. Aslan D, Kiper N, Karaağaoğlu E. Registered with the chamber in Turkey burnout syndrome and related factors in a group of physicians. August 2005, TTB Publication, ANKARA.
62. Buğdaycı R, Kurt AÖ, Şaşmaz T, Öner S. Depression frequency and affecting factors in general practitioners and specialist physicians in Mersin province. *Community Medicine Bulletin*. 2007; 26 (1)
63. Oray ÇN, Balcı B, Özlem EN, Özçalar E, Abalı L, İbiş AM, Öncel T. The occupational burnout levels of medical residents in Dokuz Eylül University Faculty of Medicine. *DEÜ Faculty of Medicine Journal* 2013; 27 (2). 67 - 73.
64. Morais A, Maia P, Azevedo A, Amaral C, Tavares J. Stress and burnout among Portuguese anaesthesiologists. *European Journal of Anaesthesiology*. 2006; 23 (5): 433-439.
65. Fernández Torres B, Roldán Pérez LM, Guerra Vélez A, Roldán Rodríguez T, Gutiérrez Guillén A, De las Mulas Béjar M. Prevalence of burnout among anesthesiologists at Hospital Universitario Virgen Macarena de Sevilla. *Rev Esp Anestesiol Reanim*. 2006; 53 (6): 359-362.
66. van der Wal RA, Bucx MJ, Hendriks JC, Scheffer GJ, Prins JB. Psychological distress, burnout and personality traits in Dutch anaesthesiologists: A survey. *Eur J Anaesthesiol*. 2016; 33 (3): 179-186.
67. Lee FJ, Stewart M, Brown JB. Stress, burnout, and strategies for reducing them: what's the situation among Canadian family physicians? *Can Fam Physician*. 2008; 54 (2): 234-235.
68. Sánchez-Cruz J, Mugártegui-Sánchez S. Burnout syndrome among family physicians. *Rev Med Inst Mex Seguro Soc*. 2013; 51 (4): 428-431.
69. Adam S, Mohos A, Kalabay L, Torzsa P. Potential correlates of burnout among general practitioners and residents in Hungary: the significant role of gender, age, dependent care and experience. *BMC Fam Pract*. 2018; 19 (1): 193.
70. Goehring C, Bouvier Gallacchi M, Künzi B, Bovier P. Psychosocial and professional characteristics of burnout in Swiss primary care practitioners: a cross-sectional survey. *Swiss Med Wkly*. 2005; 135 (7-8): 101-108. 72.
71. Arigoni F, Bovier PA, Mermillod B, Waltz P, Sappino AP. Prevalence of burnout among Swiss cancer clinicians, pediatricians and general practitioners: who are most at risk? *Support Care Cancer*. 2009; 17 (1): 75-81.
72. Czekajska-Chehab E, Drop A, Okła W. Satisfaction and stress factors in the radiologist's profession. *Annales Universitatis Mariae Curie-Sklodowska. Sectio D: Medicina*. 2003; 58 (1): 261-267.
73. Bressi C, Porcellana M, Gambini O. Burnout among psychiatrists in Milan: a multicenter survey. *Psychiatr Serv*. 2009; 60 (7): 985-988.
74. Kumar S, Fischer J, Robinson E, Hatcher S, Bhagat RN. Burnout and job satisfaction in New Zealand psychiatrists: a national study. *Int J Soc Psychiatry*. 2007; 53 (4): 306-316.
75. Glasberg, João, Horiuti, Louise, Novais, Marcela Araújo Borges, Canavezzi, Andressa Zaccaro, Miranda, Vanessa da Costa, Chicoli, Felipe Abrosio, Gonçalves, Marina Sahade, Bensi, Carolina Games, & del Giglio,

76. Balch CM, Shanafelt TD, Sloan J. Burnout and career satisfaction among surgical oncologists compared with other surgical specialties. *Ann Surg Oncol* 2011;18: 16--25.
77. Rath KS, Huffman LB, Phillips GS. Burnout and associated among factors members of the Society of Gynecologic Oncology. *Am J Obstet Gynecol* 2015; 213: 824.e1-9. 79.
78. Allegra CJ, Hall R, Yothers G. Prevalence of burnout in the U.S. Oncology community: results of a 2003 survey. *J Oncol Pract*. 2005; 1 (4): 140-147
79. Sadat-Ali M, Al-Habdan IM, Al-Dakheel DA, Shriyan D. Are orthopedic surgeons prone to burnout? *Saudi Med J*. 2005; 26 (8): 1180-1182
80. Orton P, Orton C, Pereira Gray D. Depersonalized doctors: a cross-sectional study of 564 doctors, 760 consultations and 1876 patient reports in UK general practice. *BMJ Open*. 2012; 2 (1):
81. Sharma A, Sharp DM, Walker LG, Monson JR. Stress and burnout in colorectal and vascular surgical consultants working in the UK National Health Service. *Psychooncology*. 2008; 17 (6): 570-576.
82. Rotenstein LS, Torre M, Ramos MA. Prevalence of burnout among physicians: A systematic review. *JAMA*. 2018; 320 (11): 1131--1150.
83. West CP, Dyrbye LN, Shanafelt TD. Physician burnout: contributors, consequences and solutions. *J Intern Med*. 2018; 283 (6): 516--29
84. Lanballe EM, Innstrand ST, Aasland OG, Falkum E. The predictive value of individual factors, work related factors, and work - home interaction on burnout in female and male physicians; a longitudinal study. *Stress Health* 2011; 27: 73-87.
85. Dyrbye LN, Shanafelt TD, Balch CM, Satele D, Sloan J, Freischlag J. Relationship between work-home conflicts and burnout among American surgeons: a comparison by sex. *Arch Sur* 2011; 146: 211--217
86. Shanafelt TD, Oreskovich MR, Dyrbye LN. Avoiding burnout: the personal health habits and wellness practices of US surgeons. *Ann Surg* 2012; 255: 625--633
87. Shanafelt TD, Sloan JA, Habermann TM. The wellbeing of physicians. *The American Journal of Medicine*. 2003 Apr; 114 (6): 513-519
88. Upton D, Mason V, Doran B, Solowiej K, Shiralkar U, Shiralkar S. The experience of burnout across different surgical specialties in the United Kingdom: a cross-sectional survey. *Surgery*. 2012 Apr; 151 (4): 493-501.
89. Galaiya R, Kinross J, Arulampalam T. Factors associated with burnout syndrome in surgeons: a systematic review. *Ann R Coll Surg Engl*. 2020; 102 (6): 401-407
90. Woodside J, Miller M, Floyd M, McGowen R, Pfortmiller D. Observations on burnout in family medicine and psychiatry residents. *Academic psychiatry*: 2008 (32) 13-9.
91. Jovanovic N, Beezhold J, Andlauer O, Kuzman M, Podlesek A, Hanon C, Schulze B. Burnout among psychiatry residents: The International Psychiatry Resident / Trainee Burnout Syndrome Study 2009 (BoSS). 10.5167 / uzh-19403.
92. Martini S, Arfken CL, Churchill A, Balon R. Burnout comparison among residents in different medical specialties. *Acad Psychiatry*. 2004; 28 (3): 240-242.
93. Jugale PV, Mallaiah P, Krishnamurthy A, Sangha R. and work engagement among dental practitioners in Bangalore city: A cross-sectional study. *J Clin Diagn Res*. 2016; 10: ZC63--7
94. Shetty SH, Assem Y, Khedekar RG, Asha S, Arora M. Indian orthopedic surgeons are less burned out than their western colleagues. *J Arthrosc Jt Surg*. 2017; 4: 1--7 96.
95. Sreelatha P, Premalal L, Ryali VS. Burnout and coping strategies among residents of a private medical college in South India: A cross-sectional study. *Ind Psychiatry J*. 2018; 27.213--8.
96. Patel RS, Bachu R, Adikey A, Malik M, Shah M. Factors related to physician burnout and its consequences: A review. *Behav Sci (Basel)*. 2018; 8 (11): 98.
97. Amofo E, Hanbali N, Patel A, Singh P. What are the significant factors associated with burnout in doctors? *Occup Med (Lond)*. 2015; 65 (2): 117-21.
98. Dyrbye LN, West CP, Satele D, Sloan JA, Shanafelt TD. Work / home conflict and burnout among academic internal medicine physicians. *Arch Intern Med* 2011; 171: 1207--1209 100
99. Estry-Behar M, Doppia MA, Guetarni K. Emergency physicians accumulate more stress factors than other physicians — results from the French SESMAT study. *Emerg Med J* 2011; 28: 397--4
100. Lefebvre DC. Perspective: resident physician wellness: a new hope. *Acad Med* 2012; 87: 598-602. 102.
101. Chan MK, Chew QH, Sim K. Burnout and associated factors in psychiatry residents: a systematic review. *Int J Med Educ*. 2019 30; 10: 149-160. PMID: 31381505;
102. Ripp J, Babyatsky M, Fallar R, Bazari H, Bellini L, Kapadia C, Katz JT, Pecker M, Korenstein D. The incidence and predictors of job burnout in first-year internal medicine residents: a five-institution study. *Acad Med*. 2011; 86 (10): 1304-10.
103. Eckleberry-Hunt J, Lick D, Boura J, Hunt R, Balasubramaniam M, Mulhem E, Fisher C. An exploratory study of resident burnout and wellness. *Acad Med*. 2009 Feb; 84 (2): 269-77.
104. Shapiro J, Zhang B, Warm EJ. Residency as a Social Network: Burnout, Loneliness, and Social Network Centrality. *J Grad Med Educ*. 2015 Dec; 7 (4): 617-23.
105. Koutsimani P, Montgomery A, Georganta K. The Relationship between burnout, depression, and anxiety: A systematic review and meta-analysis. *Front Psychol*. 2019 13; 10: 284.
106. Patel R, Huggard P, van Toledo A. Occupational Stress and Burnout among Surgeons in Fiji. *Front Public Health*. 2017 9; 5: 41.
107. Al-Dubai SA, Rampal KG. Prevalence and associated factors of burnout among doctors in Yemen. *J Occup Health*. 2010; 52 (1): 58-65.
108. Stodel JM, Stewart-Smith A. The influence of burnout on skills retention of junior doctors at Red Cross War Memorial Children's Hospital: a case study. *S Afr Med J*. 2011; 101 (2): 115-8.