Appendix 2 (as supplied by the authors): Demographic characteristics of 118 datasets from 114 studies included in the meta-analysis

Author	Country	N PMTs	Males (%)	Specialty	Year of Survey	Experiencing Burnout (%)	Tool used to Measure Burnout
Abdulrahman(1) et al, 2018	United Arab Emirates	302	63 (21.0)	Multiple	2016	70.20%	MBI
Agha (2) et al, 2015	Saudi Arabia	96	64 (67)	Multiple	NS	88.54%	MBI
Aksoy (3) et al, 2014 [Dataset 1]	Turkey	28	10 (47)	Pediatrics	NS	27.27%	MBI
Aksoy (3) et al, 2014 [Dataset 2]	Turkey	38	16 (47)	Internal Medicine	NS	33.33%	MBI
Al-Ma'mari (4) et al, 2016	Canada	143	19 (13.0)	Obstetrics and Gynecology	NS	73.70%	MBI
Aldrees (5) et al, 2013	Saudi Arabia	159	NR	Multiple	2010	86.00%	MBI
Aldrees (6) et al, 2015	Saudi Arabia	85	57 (67)	Otolaryngology	2013	45.00%	MBI
Aldrees (7) et al, 2017	Saudi Arabia	38	28 (74)	Plastic Surgery	2015	47.00%	MBI
Arora (8) et al, 2014	Australia	51	NR	Orthopedic Surgery	2012	53.00%	MBI
Ashkar (9) et al, 2010	Lebanon	155	86 (55.5)	Multiple	2008	80.00%	MBI
Attenello (10) et al, 2018	USA	346	270 (78.0)	Neurosurgery	2015	67.00%	MBI
Becker (11) et al, 2006	USA	118	25 (20.8)	Obstetrics and Gynecology	2004	21.00%	MBI
Billings (12) et al, 2011	USA	284	131 (46.0)	Internal Medicine	2008 to 2010	45.00%	MBI
Blanchard (13) et al, 2010	France	204	82 (40.0)	Oncology	2009	44.00%	MBI
Bogg (14) et al, 2001	England	56	NR	Multiple	NS	25.00%	MBI
Braun (15) et al, 2017	USA	32	25 (79)	Internal Medicine	2014	50.00%	MBI
Campbell (16) et al, 2010	USA	86	44 (51)	Internal Medicine	2003 to 2008	67.00%	MBI
Castelo-Branco (17) et al, 2007	Spain	109	15 (14.0)	Obstetrics and Gynecology	2004	58.00%	MBI
Chaput (18)et al, 2015	France	52	26 (50)	Plastic surgery	2013	28.80%	MBI

Appendix to: Naji L, Singh B, Shah A, et al. Global prevalence of burnout among postgraduate medical trainees: a systematic review and meta-regression.
CMAJ Open 2021. DOI:10.9778/cmajo.20200068.

Chati (19)et al, 2017	France	251	144 (57.5)	General Surgery	2013	52.00%	MBI
Chaukos (20) et al, 2017 [Dataset 1]	USA	54	21 (40)	Internal Medicine	NS	31.00%	MBI
Chaukos et al, (20) 2017 [Dataset 2]	USA	14	6 (40)	Psychiatry	NS	14.00%	MBI
Cofer et al, (21) 2018	USA	40	27 (68)	General Surgery	2016	25.00%	MBI
Cubero et al, (22) 2016	Brazil	54	29 (54)	Oncology	2010	76.00%	MBI
De Andrade (23) et al, 2016	Brazil	32	7 (22)	Pediatrics	2009	18.80%	MBI
Dominguez (24) et al, 2018	Colombia	202	129 (69.3)	NR	2015	33.20%	MBI
Dyrbye et al, (25)2014	USA	1701	827 (48.6)	Multiple	2012	60.30%	MBI
Elmore et al, (26) 2016	USA	665	375 (56.4)	General Surgery	2014	69.00%	MBI
Embriaco et al, (27) 2007	France	372	NR	NR	2004	42.70%	MBI
Fahrenkopf et al, (28)2008	USA	123	37 (30.0)	NR	2003	75.00%	MBI
Galam et al, (29) 2013	France	4050	1268 (31.3)	General Practice	2011	24.10%	MBI
Garza et al, (30) 2004	USA	136	39 (29.9)	Obstetrics and Gynecology	NR	18.00%	MBI
Goitein et al, (31) 2005	USA	118	56 (47.5)	Internal Medicine	2004	68.00%	MBI
Golub et al, (32) 2007	USA	514	406 (79.0)	Otolaryngology	2005	10.00%	MBI
Gopal et al, (33) 2005	USA	121	58 (48.0)	Internal Medicine	2003	61.00%	MBI
Gopal et al, (34) 2007	USA	106	45 (42.5)	Internal medicine	2004	55.00%	MBI
Gouveia et al, (35) 2017	Brazil	129	62 (48.0)	Multiple	2015	27.90%	MBI
Govardhan et al, (36) 2012	USA	49	4 (9)	Obstetrics and Gynecology	2009	13.00%	MBI
Goveia et al, (37) 2018	Brazil	37	NR	Anesthesia	2014 to 2015	2.70%	MBI
Hameed et al, (38) 2018	Saudi Arabia	181	75 (41.4)	Multiple	2013 to 2014	80.70%	MBI
Hill et al, (39) 2009	USA	22	NR	Otolaryngology	2006	31.82%	MBI
Holmes et al, (40) 2017	USA	276	97 (35.0)	Multiple	2014	69.00%	MBI
Jamjoom et al, (41) 2018	Saudi Arabia	32	2 (6)	Pediatrics	2016	70.00%	MBI

Appendix to: Naji L, Singh B, Shah A, et al. Global prevalence of burnout among postgraduate medical trainees: a systematic review and meta-regression.
CMAJ Open 2021. DOI:10.9778/cmajo.20200068.

Joaquim et al, (42) 2018	Portugal	115	30 (26.3)	Oncology	2011	45.20%	MBI
Krug et al, (43) 2017	USA	112	47 (42.0)	Internal Medicine	2012	61.00%	MBI
Kwah et al, (44) 2016	USA	32	NR	Internal Medicine	2012	75.00%	MBI
Landrigan et al, (45) 2008 [Dataset 1]	USA	213	62 (29.3)	Pediatrics	2003 & 2004	75.40%	MBI
Landrigan et al, (45) 2008 [Dataset 2]	USA	213	78 (31.7)	Pediatrics	2003 & 2004	57.00%	MBI
Lee et al, (46) 2018	Singapore	446	208 (46.6)	Multiple	2015	80.70%	MBI
Leung et al, (47) 2017	Australia, New Zealand	107	53 (50.0)	Oncology	2015	49.50%	MBI
Levin et al, (48) 2017	USA	354	182 (51.4)	Neurology	2016	67.20%	MBI
Lin et al, (49) 2016	USA	73	42 (58)	General Surgery	2013 to 2014	82.00%	MBI
Lindeman et al (50) , 2013 [Dataset 1]	USA	30	21 (70)	General Surgery	2011	93.00%	MBI
Lindeman et al, (50) 2013 [Dataset 2]	USA	36	24 (67)	General Surgery	2012	75.00%	MBI
Lindeman et al, (51) 2017	USA	88	46 (52)	General Surgery	2016	51.00%	MBI
Llera et al, (52) 2014	Argentina	92	28 (30)	Multiple	2011	19.60%	MBI
Malik et al, (53) 2016	Pakistan	133	98 (73.7)	Multiple	NS	57.90%	MBI
Martini et al, (54)2004	USA	110	NR	Multiple	2003	49.00%	MBI
Martini et al, (55) 2006	USA	118	NR	Multiple	2004	41.00%	MBI
Mohammed et al, (56) 2014	Egypt	84	46 (55)	Multiple	2012	76.00%	MBI
Msaouel et al, (57) 2010	Greece	311	172 (55.3)	Multiple	NR	49.50%	MBI
Nolan et al, (58) 2017	Canada	166	43 (26.0)	Pediatrics	2014	42.00%	MBI
O'Connor et al, (59) 2017	Ireland	172	75 (43.6)	Multiple	2015	69.50%	MBI
Olson et al, (60) 2014	USA	76	40 (53)	Internal Medicine	2012	53.90%	MBI
Olson et al, (61) 2015	USA	45	16 (36)	Pediatrics	2014	40.00%	MBI
Pantaleoni et al, (62) 2014	USA	61	NR	Pediatrics	2011	46.00%	MBI
Ramey et al, (63) 2017	USA	205	141 (68.8)	Oncology	2016	33.20%	MBI

Appendix to: Naji L, Singh B, Shah A, et al. Global prevalence of burnout among postgraduate medical trainees: a systematic review and meta-regression.
CMAJ Open 2021. DOI:10.9778/cmajo.20200068.

Ripp et al, (64) 2010	USA	145	73 (50.3)	Internal Medicine	2007	34.00%	MBI
Ripp et al, (65) 2011	USA	191	126 (66.0)	Internal Medicine	2009	81.00%	MBI
Ripp et al, (66) 2015	USA	133	77 (58.0)	Internal Medicine	2012	75.00%	MBI
Rosen et al, (67) 2006	USA	47	23 (49)	Internal Medicine	2003	55.30%	MBI
Sajjadi et al, (68) 2017	Canada	43	19 (45)	IM	2014	21.00%	MBI
Sargent et al, (69) 2009	USA	384	338 (88.0)	Orthopedic Surgery	NR	56.00%	MBI
Shanafelt et al, (70) 2002	USA	115	54 (47.0)	Internal Medicine	2001	76.00%	MBI
Siu et al, (71) 2012	Hong Kong	77	NR	NR	2009	48.00%	MBI
Spataro et al (72) , 2016	USA	198	102 (51.0)	Internal Medicine	2014	22.00%	MBI
Sulaiman et al, (73) 2017	Ireland	265	140 (52.8)	Multiple	NS	26.40%	MBI
Toral-Villanueva (74) et al, 2009	Mexico	312	177 (57.0)	Multiple	2003	40.00%	MBI
Waldman (75) et al, 2009	Argentina	106	70 (66.0)	Cardiology	2007	80.20%	MBI
Willcock (76) et al, 2004	Australia	110	70 (56.0)	Psychiatry	2001	54.00%	MBI
Williford (77) et al, 2018	USA	76	NR	General Surgery	2017	75.00%	MBI
Zis et al, (78) 2014	Greece	263	141 (53.6)	Multiple	2012	14.40%	MBI
Zis et al, (79) 2015	Greece	116	52 (44.8)	Neurology	2014	18.10%	MBI
Talih et al, (80) 2016	Lebanon	118	62 (53.0)	Multiple	2013	27.00%	Burnout Measure (modified)
Pereira-Lima (81) et al, 2015	Brazil	305	159 (52.1)	Multiple	NR	58.36%	Burnout Syndrome Inventory
See et al, (82) 2016	Singapore	64	NR	Internal Medicine	2013	71.80%	Copenhagen Burnout Inventory
Jovanovic et al, (83) 2016	Europe	1980	804 (40.6)	Psychiatry	2008 to 2012	36.70%	MBI-GS
Miyoshi et al, (84) 2016	Japan	85	47 (55)	NR	2013	30.59%	MBI-GS
Torppa et al, (85) 2015	Finland	97	NR	General Practice	2011	16.50%	Modified MBI (1 item)
De Oliveira Jr (86) et al, 2013	USA	1417	808 (57.0)	Anesthesia	NR	41.00%	Modified MBI (12 questions)

Appendix to: Naji L, Singh B, Shah A, et al. Global prevalence of burnout among postgraduate medical trainees: a systematic review and meta-regression.
CMAJ Open 2021. DOI:10.9778/cmajo.20200068.

Ruitenburng et al, (87) 2012	Netherlands	181	76 (42.0)	Multiple	2009	7.00%	Modified MBI (13 items)
Ringrose et al, (88) 2009	Netherlands	47	23 (49)	Multiple	2007	31.00%	Modified MBI (15 items)
McNeeley et al, (89) 2013	USA	249	182 (73.0)	Radiology	2012	62.00%	Modified MBI (2 Single Item Measures, & PA (5 items))
Porrino et al,(90) 2017	USA	58	48 (83)	Radiology	2016	87.90%	Modified MBI (2 Single Item Measures, & PA (5 items))
Baer et al, (91) 2017	USA	258	54 (21.1)	Pediatrics	2013	39.10%	Modified MBI (2-Single Item Measures of EE and DP)
Mordant et al,(92) 2014	Italy (n=34), Netherlands (n=22), France (n=22), Belgium (n=17), UK (n=14), Austria (n=7), Portugal (n=5), Poland (n=4), Spain (n=4), Slovenia (n=4), Germany (n=3), Lithuania (n=3), Greece (n=2), Ukraine (n=2), Ireland (n=2), Bulgaria (n=2), Other (n=22)	155	103 (66.5)	Multiple	2010	24.80%	Modified MBI (2-Single Item Measures of EE and DP)
Shanafelt et al, (93) 2014	USA	1345	710 (52.8)	Oncology	2014	34.10%	Modified MBI (2-Single Item

							Measures of EE and DP)
Simpkin et al, (94) 2018	US and Canada	49	15 (30)	Pediatrics	2015	31.00%	Modified MBI (2-Single Item Measures of EE and DP)
Trockel et al,(95) 2018	USA	185	NR	Multiple	NS	50.00%	Modified MBI (2-Single Item Measures of EE and DP)
van Vendelo (96) et al, 2014	Netherlands	105	83 (79.0)	Orthopedic Surgery	2011	27.60%	Modified MBI (2-Single Item Measures of EE and DP)
Prins et al, (97) 2007	The Netherlands	158	76 (48.0)	Multiple	2003	13.00%	Modified MBI (20 items)
Prins et al,(98) 2010	The Netherlands	2115	820 (38.8)	Multiple	2005	21.00%	Modified MBI (20 items)
van der Wal et al, (99) 2016	Netherlands	141	53 (37.6)	Anesthesia	2012	11.30%	Modified MBI (20 items)
van Vendeloo et al, (100) 2018	Netherlands	1231	325 (26.4)	Multiple	2015	15.00%	Modified MBI (20 items)
van Vendeloo et al,(101) 2018	Belgium	236	96 (40.7)	Multiple	2016	41.50%	Modified MBI (20 items)
Block et al, (102) 2013	USA	55	29 (53)	Internal Medicine	2011	76.00%	Modified MBI (6 items)
Lebares et al,(103) 2018	USA	566	277 (49.0)	General Surgery	2016	68.95%	Modified MBI (9 items)
Shakir et al, (104) 2017	USA	255	205 (80.4)	Neurosurgery	2016	36.50%	Modified MBI (9 items)
Huggard et al, (105) 2011	New Zealand	253	104 (41.1)	Multiple	NR	19.50%	Professional Quality of Life Index Version 3
Low et al, (106) 2018	Singapore	43	18 (43)	Multiple	2015	34.88%	Professional Quality of Life Scale

Appendix to: Naji L, Singh B, Shah A, et al. Global prevalence of burnout among postgraduate medical trainees: a systematic review and meta-regression.
CMAJ Open 2021. DOI:10.9778/cmajo.20200068.

Markwell et al, (107) 2009	Australia, New Zealand	914	402 (44.0)	Multiple	2008	69.00%	Professional Quality of Life Scale
Cooke et al, (108) 2013	Australia	128	NR	General Practice	2010	14.00%	Single item measure
Kealy et al, (109) 2016	Canada	400	123 (30.8)	Psychiatry	2014	21.00%	Single item measure
Lambden et al, (110) 2018	USA	72	NR	Multiple	2017	53.50%	Single item measure
Leach et al, (111) 2018	USA	43	27 (63)	General Surgery	2017	30.20%	Single item measure
Raviola et al, (112) 2002	Kenya	50	NR	Multiple	NS	82.00%	Single item measure
Robertson et al,(113) 2017	USA	340	143 (42.0)	Multiple	2015	34.00%	Single item measure
Schweitzer, (114)1994	South Africa	36	NR	NR	NR	55.50%	Single item measure

REFERENCES

1. Abdulrahman M, Farooq MM, Al Kharmiri A, Al Marzooqi F, Carrick FR. Burnout and depression among medical residents in the United Arab Emirates: A Multicenter study. J Fam Med Prim care. 2018;7(2 PG-435-441):435–41.
2. Agha A, Mordya A, Anwar E, Saleh N, Rashid I, Saeed M. Burnout among middle-grade doctors of tertiary care hospital in Saudi Arabia. Work J Prev Assess Rehabil. 2015;51(4 PG-839-847):839–47.
3. Aksoy DY, Durusu Tanriover M, Dizdar O, Kalyoncu U, Karakaya J, Unal S, et al. Burnout syndrome during residency in internal medicine and pediatrics in a country without working time directive. Int J Health Care Qual Assur. 2014;27(3 PG-223-230):223–30.
4. Al-Ma'mari NO, Naimi AI, Tulandi T. Prevalence and predictors of burnout among obstetrics and gynecology residents in Canada. Gynecol Surg. 2016;13(4 PG-323-327):323–7.
5. Aldrees TM, Aleissa S, Zamakhshary M, Badri M, Sadat-Ali M. Physician well-being: Prevalence of burnout and associated risk factors in a tertiary hospital, Riyadh, Saudi Arabia. Ann Saudi Med. 2013;33(5 PG-451-456):451–6.
6. Aldrees T, Badri M, Islam T, Alqahtani K. Burnout among otolaryngology residents in Saudi Arabia: A multicenter study. J Surg Educ. 2015;72(5 PG-844-848):844–8.
7. Aldrees T, Hassouneh B, Alabdulkarim A, Asad L, Alqaryan S, Aljohani E, et al. Burnout among plastic surgery residents:

National survey in Saudi Arabia. Saudi Med J. 2017;38(8 PG-832-836):832–6.
8. Arora M, Diwan AD, Harris IA. Prevalence and factors of burnout among Australian orthopaedic trainees: a cross-sectional study. J Orthop Surg (Hong Kong). 2014;22(3 PG-374-7):374–7.
9. Ashkar K, Romani M, Musharrafieh U, Chaaya M. Prevalence of burnout syndrome among medical residents: experience of a developing country. Postgrad Med J. 2010;86(1015 PG-266-71):266–71.
10. Attenello FJ, Buchanan IA, Wen T, Donoho DA, McCartney S, Cen SY, et al. Factors associated with burnout among US neurosurgery residents: a nationwide survey. J Neurosurg. 2018;(PG-1-15):1–15.
11. Becker JL, Milad MP, Klock SC. Burnout, depression, and career satisfaction: Cross-sectional study of obstetrics and gynecology residents. Am J Obstet Gynecol. 2006;195(5 PG-1444-1449):1444–9.
12. Billings ME, Lazarus ME, Wenrich M, Curtis JR, Engelberg RA. The effect of the hidden curriculum on resident burnout and cynicism. J Grad Med Educ. 2011;3(4 PG-503-10):503–10.
13. Blanchard P, Truchot D, Albiges-Sauvin L, Dewas S, Pointreau Y, Rodrigues M, et al. Prevalence and causes of burnout amongst oncology residents: a comprehensive nationwide cross-sectional study. Eur J Cancer. 2010;46(15 PG-2708-15):2708–15.
14. Bogg J, Gibbs T, Bundred P. Training, job demands and mental health of pre-registration house officers. Med Educ. 2001;35(6 PG-590-5):590–5.
15. Braun SE, Auerbach SM, Rybarczyk B, Lee B, Call S. Mindfulness, burnout, and effects on performance evaluations in internal medicine residents. Adv Med Educ Pract. 2017;8(PG-591-597):591–7.
16. Campbell J, Prochazka A V, Yamashita T, Gopal R. Predictors of persistent burnout in internal medicine residents: a prospective cohort study. Acad Med. 2010;85(10 PG-1630-4):1630–4.
17. Castelo-Branco C, Figueras F, Eixarch E, Quereda F, Cancelo MJ, Gonzalez S, et al. Stress symptoms and burnout in obstetric and gynaecology residents. BJOG An Int J Obstet Gynaecol. 2007;114(1 PG-94-98):94–8.
18. Chaput B, Bertheuil N, Jacques J, Smilevitch D, Bekara F, Soler P, et al. Professional Burnout Among Plastic Surgery Residents: Can it be Prevented? Outcomes of a National Survey. Ann Plast Surg. 2015;75(1 PG-2-8):2–8.
19. Chati R, Huet E, Grimberg L, Schwarz L, Tuech J-J, Bridoux V. Factors associated With burnout among French digestive surgeons in training: results of a national survey on 328 residents and fellows. Am J Surg. 2017;213(4 PG-754-762):754–62.
20. Chaukos D, Chad-Friedman E, Mehta DH, Byerly L, Celik A, McCoy TH, et al. Risk and Resilience Factors Associated with Resident Burnout. Acad Psychiatry. 2017;41(2 PG-189-194):189–94.
21. Cofer KD, Hollis RH, Goss L, Morris MS, Porterfield JR, Chu DI. Burnout is Associated With Emotional Intelligence but not Traditional Job Performance Measurements in Surgical Residents. J Surg Educ. 2018;(PG-).
22. Cubero DIG, Fumis RRL, de Sa TH, Dettino A, Costa FO, Van Eyll BMRHA, et al. “Burnout in Medical Oncology Fellows: a

Prospective Multicenter Cohort Study in Brazilian Institutions." J Cancer Educ. 2016;31(3 PG-582-7):582–7.
23. De Andrade APM, Amaro E, Farhat SCL, Schvartsman C. Higher burnout scores in paediatric residents are associated with increased brain activity during attentional functional magnetic resonance imaging task. Acta Paediatr Int J Paediatr. 2016;105(6 PG-705-713):705–13.
24. Dominguez LC, Stassen L, de Grave W, Sanabria A, Alfonso E, Dolmans D. Taking control: Is job crafting related to the intention to leave surgical training? PLoS One. 2018;13(6 PG-e0197276):e0197276.
25. Dyrbye LN, West CP, Satele D, Boone S, Tan L, Sloan J, et al. Burnout among u.s. medical students, residents, and early career physicians relative to the general u.s. population. Acad Med. 2014;89(3 PG-443-451):443–51
26. Elmore LC, Jeffe DB, Jin L, Awad MM, Turnbull IR. National Survey of Burnout among US General Surgery Residents. J Am Coll Surg. 2016;223(3 PG-440-451):440–51.
27. Embriaco N, Azoulay E, Barrau K, Kentish N, Pochard F, Loundou A, et al. High level of burnout in intensivists: Prevalence and associated factors. Am J Respir Crit Care Med. 2007;175(7 PG-686-692):686–92.
28. Fahrenkopf AM, Sectish TC, Barger LK, Sharek PJ, Lewin D, Chiang VW, et al. Rates of medication errors among depressed and burnt out residents: Prospective cohort study. BMJ. 2008;336(7642 PG-488-491):488–91.
29. Galam E, Komly V, Le Tourneur A, Jund J. Burnout among French GPs in training: A cross-sectional study. Br J Gen Pract. 2013;63(608 PG-e217-e224):e217–24.
30. Garza JA, Schneider KM, Promecene P, Monga M. Burnout in residency: Statewide study. South Med J. 2004;97(12 PG-1171-1173):1171–3.
31. Goitein L, Shanafelt TD, Wipf JE, Slatore CG, Back AL. The effects of work-hour limitations on resident well-being, patient care, and education in an internal medicine residency program. Arch Intern Med. 2005;165(22 PG-2601-2606):2601–6.
32. Golub JS, Weiss PS, Ramesh AK, Ossoff RH, Johns 3rd MM. Burnout in residents of otolaryngology-head and neck surgery: a national inquiry into the health of residency training. Acad Med. 2007;82(6 PG-596-601):596–601.
33. Gopal R, Glasheen JJ, Miyoshi TJ, Prochazka A V. Burnout and internal medicine resident work-hour restrictions. Arch Intern Med. 2005;165(22 PG-2595-2600):2595–600.
34. Gopal RK, Carreira F, Baker WA, Glasheen JJ, Crane LA, Miyoshi TJ, et al. Internal Medicine Residents Reject "Longer and Gentler" Training. J Gen Intern Med. 2007 Jan;22(1):102–6.
35. Gouveia PA da C, Ribeiro MHCN, Aschoff CA de M, Gomes DP, Silva NAF da, Cavalcanti HAF. Factors associated with burnout syndrome in medical residents of a university hospital. Rev Assoc Med Bras. 2017;63(6 PG-504-511):504–11.
36. Govardhan LM, Pinelli V, Schnatz PF. Burnout, depression and job satisfaction in obstetrics and gynecology residents. Conn Med. 2012;76(7 PG-389-95):389–95
37. Goveia CS, Cruz TTMD, de Miranda DB, Guimaraes GMN, Ladeira LCA, Tolentino FDS, et al. Association between burnout

syndrome and anxiety in residents and anesthesiologists of the Federal District. Brazilian J Anesthesiol. 2018;(PG-).
38. Hameed TK, Masuadi E, Al Asmary NA, Al-Anzi FG, Al Dubayee MS. A study of resident duty hours and burnout in a sample of Saudi residents. BMC Med Educ. 2018;18(1 PG-180):180.
39. Hill JD, Smith RJH. Monitoring stress levels in postgraduate medical training. Laryngoscope. 2009;119(1 PG-75-8):75–8.
40. Holmes EG, Connolly A, Putnam KT, Penaskovic KM, Denniston CR, Clark LH, et al. Taking Care of Our Own: A Multispecialty Study of Resident and Program Director Perspectives on Contributors to Burnout and Potential Interventions. Acad Psychiatry. 2017;41(2 PG-159-166):159–66.
41. Jamjoom RS, Park YS. Assessment of pediatric residents burnout in a tertiary academic centre. Saudi Med J. 2018;39(3 PG-296-300):296–300.
42. Joaquim A, Custodio S, Savva-Bordalo J, Chacim S, Carvalhais I, Lombo L, et al. Burnout and occupational stress in the medical residents of Oncology, Haematology and Radiotherapy: a prevalence and predictors study in Portugal. Psychol Health Med. 2018;23(3 PG-317-324):317–24.
43. Krug MF, Golob AL, Wander PL, Wipf JE. Changes in Resident Well-Being at One Institution Across a Decade of Progressive Work Hours Limitations. Acad Med. 2017;92(10 PG-1480-1484):1480–4.
44. Kwah J, Weintraub J, Fallar R, Ripp J. The Effect of Burnout on Medical Errors and Professionalism in First-Year Internal Medicine Residents. J Grad Med Educ. 2016;8(4 PG-597-600):597–600.
45. Landrigan CP, Fahrenkopf AM, Lewin D, Sharek PJ, Barger LK, Eisner M, et al. Effects of the Accreditation Council for Graduate Medical Education Duty Hour Limits on Sleep, Work Hours, and Safety. Pediatrics. 2008 Aug;122(2):250–8.
46. Lee PT, Loh J, Sng G, Tung J, Yeo KK. Empathy and burnout: A study on residents from a Singapore institution. Singapore Med J. 2018;59(1 PG-50-54):50–4.
47. Leung J, Rioseco P. Burnout, stress and satisfaction among Australian and New Zealand radiation oncology trainees. J Med Imaging Radiat Oncol. 2017;61(1 PG-146-155):146–55.
48. Levin KH, Shanafelt TD, Keran CM, Busis NA, Foster LA, Molano JR V, et al. Burnout, career satisfaction, and well-being among US neurology residents and fellows in 2016. Neurology. 2017;89(5 PG-492-501):492–501.
49. Lin DT, Liebert CA, Tran J, Lau JN, Salles A. Emotional Intelligence as a Predictor of Resident Well-Being. J Am Coll Surg. 2016;223(2 PG-352-358):352–8.
50. Lindeman BM, Sacks BC, Hirose K, Lipsett PA. Multifaceted longitudinal study of surgical resident education, quality of life, and patient care before and after july 2011. J Surg Educ. 2013;70(6 PG-769-776):769–76.
51. Lindeman B, Petrusa E, McKinley S, Hashimoto DA, Gee D, Smink DS, et al. Association of Burnout With Emotional Intelligence and Personality in Surgical Residents: Can We Predict Who Is Most at Risk? J Surg Educ. 2017;74(6 PG-e22-e30):e22–30.

52. Llera J, Durante E. Correlation between the educational environment and burn-out syndrome in residency programs at a university hospital. Arch Argent Pediatr. 2014;112(1 PG-6-11):6–11.
53. Malik AA, Bhatti S, Shafiq A, Khan RS, Butt UI, Bilal SM, et al. Burnout among surgical residents in a lower-middle income country - Are we any different? Ann Med Surg. 2016;9(PG-28-32):28–32.
54. Martini S, Arfken CL, Churchill A, Balon R. Burnout comparison among residents in different medical specialties. Acad Psychiatry. 2004;28(3 PG-240-242):240–2.
55. Martini S, Arfken CL, Balon R. Comparison of Burnout Among Medical Residents Before and After the Implementation of Work Hours Limits. Acad Psychiatry. 2006 Aug;30(4):352–5.
56. Mohammed KA-M, Ali EG, Youssef IM, Fahmy MT, Haggag WE. Depression and burnout among residents. Arab J Psychiatry. 2014;25(1 PG-40-51):40–51.
57. Msaouel P, Keramaris NC, Tasoulis A, Kolokythas D, Syrmos N, Pararas N, et al. Burnout and training satisfaction of medical residents in Greece: will the European Work Time Directive make a difference? Hum Resour Health. 2010;8(PG-16):16.
58. Nolan KJ, Writer H, Ladhani M. Wellness in Canadian paediatric residents and their program directors. Paediatr Child Heal. 2017;22(4 PG-199-202):199–202.
59. O'Connor P, Lydon S, O'Dea A, Hehir L, Offiah G, Vellinga A, et al. A longitudinal and multicentre study of burnout and error in irish junior doctors. Postgrad Med J. 2017;93(1105 PG-660-664):660–4.
60. Olson SM, Odo NU, Duran AM, Pereira AG, Mandel JH. Burnout and Physical Activity in Minnesota Internal Medicine Resident Physicians. J Grad Med Educ. 2014;6(4 PG-669-74):669–74.
61. Olson K, Kemper KJ, Mahan JD. What factors promote resilience and protect against burnout in first-year pediatric and medicine-pediatric residents? J Evid Based Complementary Altern Med. 2015;20(3 PG-192-198):192–8.
62. Pantaleoni JL, Augustine EM, Sourkes BM, Bachrach LK. Burnout in pediatric residents over a 2-year period: A longitudinal study. Acad Pediatr. 2014;14(2 PG-167-172):167–72.
63. Ramey SJ, Ahmed AA, Takita C, Wilson LD, Thomas CR, Yechieli R. Burnout Evaluation of Radiation Residents Nationwide: Results of a Survey of United States Residents. Int J Radiat Oncol Biol Phys. 2017;99(3 PG-530-538):530–8.
64. Ripp J, Fallar R, Babyatsky M, David R, Reich L, Korenstein D. Prevalence of resident burnout at the start of training. Teach Learn Med. 2010;22(3 PG-172-5):172–5.
65. Ripp J, Babyatsky M, Fallar R, Bazari H, Bellini L, Kapadia C, et al. The incidence and predictors of job burnout in first-year internal medicine residents: a five-institution study. Acad Med. 2011;86(10 PG-1304-10):1304–10.
66. Ripp JA, Bellini L, Fallar R, Bazari H, Katz JT, Korenstein D. The impact of duty hours restrictions on job burnout in internal medicine residents: a three-institution comparison study. Acad Med. 2015;90(4 PG-494-499):494–9.
67. Rosen IM, Gimotty PA, Shea JA, Bellini LM. Evolution of sleep quantity, sleep deprivation, mood disturbances, empathy, and

burnout among interns. Acad Med. 2006;81(1 PG-82-85):82–5.
68. Sajjadi S, Norena M, Wong H, Dodek P. Moral distress and burnout in internal medicine residents. Can Med Educ J. 2017;8(1 PG-e36-e43):e36–43.
69. Sargent MC, Sotile W, Sotile MO, Rubash H, Barrack RL. Quality of life during orthopaedic training and academic practice. Part 1: Orthopaedic surgery residents and faculty. J Bone Jt Surg - Ser A. 2009;91(10 PG-2395-2405):2395–405.
70. Shanafelt TD, Bradley KA, Wipf JE, Back AL. Burnout and self-reported patient care in an internal medicine residency program. Ann Intern Med. 2002;136(5 PG-358-367):358–67.
71. Siu CFY, Yuen SK, Cheung A. Burnout among public doctors in Hong Kong: cross-sectional survey. Hong Kong Med J. 2012;18(3 PG-186-192):186–92.
72. Spataro BM, Tilstra SA, Rubio DM, McNeil MA. The Toxicity of Self-Blame: Sex Differences in Burnout and Coping in Internal Medicine Trainees. J Women's Heal. 2016;25(11 PG-1147-1152):1147–52.
73. Sulaiman CFC, Henn P, Smith S, O'Tuathaigh CMP. Burnout syndrome among non-consultant hospital doctors in Ireland: relationship with self-reported patient care. Int J Qual Heal care J Int Soc Qual Heal Care. 2017;29(5 PG-679-684):679–84.
74. Toral-Villanueva R, Aguilar-Madrid G, Juarez-Perez CA. Burnout and patient care in junior doctors in Mexico City. Occup Med (Lond). 2009;59(1 PG-8-13):8–13.
75. Waldman S V, Lopez Diez JC, Arazi HC, Linetzky B, Guinjoan S, Grancelli H. Burnout, perceived stress, and depression among cardiology residents in Argentina. Acad Psychiatry. 2009;33(4 PG-296-301):296–301.
76. Willcock SM, Daly MG, Tennant CC, Allard BJ. Burnout and psychiatric morbidity in new medical graduates. Med J Aust. 2004;181(7 PG-357-360):357–60.
77. Williford ML, Scarlet S, Meyers MO, Luckett DJ, Fine JP, Goettler CE, et al. Multiple-Institution Comparison of Resident and Faculty Perceptions of Burnout and Depression During Surgical Training. JAMA Surg. 2018;(PG-)
78. Zis P, Anagnostopoulos F, Sykioti P. Burnout in medical residents: A study based on the job demands-resources model. Sci World J. 2014;2014(PG-673279):673279.
79. Zis P, Artemiadis AK, Lykouri M, Xirou S, Roussopoulou A, Papageorgiou E, et al. Residency Training: Determinants of burnout of neurology trainees in Attica, Greece. Neurology. 2015;85(11 PG-e81-e84):e81–4.
80. Talih F, Warakian R, Ajaltouni J, Shehab AA, Tamim H. Correlates of Depression and Burnout Among Residents in a Lebanese Academic Medical Center: a Cross-Sectional Study. Acad Psychiatry. 2016;40(1 PG-38-45):38–45.
81. Pereira-Lima K, Loureiro SR. Burnout, anxiety, depression, and social skills in medical residents. Psychol Health Med. 2015;20(3 PG-353-362):353–62.
82. See KC, Lim TK, Kua EH, Phua J, Chua GS, Ho KY. Stress and Burnout among Physicians: Prevalence and Risk Factors in a Singaporean Internal Medicine Programme. Ann Acad Med Singapore. 2016;45(10 PG-471-474):471–4.

83. Jovanovic N, Podlesek A, Volpe U, Barrett E, Ferrari S, Kuzman MR, et al. Burnout syndrome among psychiatric trainees in 22 countries: Risk increased by long working hours, lack of supervision, and psychiatry not being first career choice. Eur Psychiatry. 2016;32(PG-34-41):34–41.
84. Miyoshi R, Matsuo H, Takeda R, Komatsu H, Abe H, Ishida Y. Burnout in Japanese residents and its associations with temperament and character. Asian J Psychiatr. 2016;24(PG-5-9):5–9.
85. Torppa MA, Kuikka L, Nevalainen M, Pitkala KH. Emotionally exhausting factors in general practitioners' work. Scand J Prim Health Care. 2015;33(3 PG-178-183):178–83.
86. De Oliveira Jr GS, Chang R, Fitzgerald PC, Almeida MD, Castro-Alves LS, Ahmad S, et al. The prevalence of burnout and depression and their association with adherence to safety and practice standards: A survey of united states anesthesiology trainees. Anesth Analg. 2013;117(1 PG-182-193):182–93.
87. Ruitenburg MM, Frings-Dresen MH, Sluiter JK. The prevalence of common mental disorders among hospital physicians and their association with self-reported work ability: a cross-sectional study. BMC Health Serv Res. 2012 Dec;12(1):292.
88. Ringrose R, Houterman S, Koops W, Oei G. Burnout in medical residents: A questionnaire and interview study. Psychol Heal Med. 2009;14(4 PG-476-486):476–86.
89. McNeeley MF, Perez FA, Chew FS. The emotional wellness of radiology trainees: Prevalence and predictors of burnout. Acad Radiol. 2013;20(5 PG-647-655):647–55.
90. Porrino J, Mulcahy MJ, Mulcahy H, Relyea-Chew A, Chew FS. Emotional Wellness of Current Musculoskeletal Radiology Fellows. Acad Radiol. 2017;24(6 PG-682-693):682–93.
91. Baer TE, Feraco AM, Tuysuzoglu Sagalowsky S, Williams D, Litman HJ, Vinci RJ. Pediatric Resident Burnout and Attitudes Toward Patients. Pediatrics. 2017;139(3 PG-).
92. Mordant P, Deneuve S, Rivera C, Carrabin N, Mieog JS, Malyshev N, et al. Quality of Life of Surgical Oncology Residents and Fellows Across Europe. J Surg Educ. 2014;71(2 PG-222-228):222–8.
93. Shanafelt TD, Raymond M, Horn L, Moynihan T, Collichio F, Chew H, et al. Oncology Fellows' Career Plans, Expectations, and Well-Being: Do Fellows Know What They Are Getting Into? J Clin Oncol. 2014;32(27 PG-2991-+):2991–+.
94. Simpkin AL, Khan A, West DC, Garcia BM, Sectish TC, Spector ND, et al. Stress From Uncertainty and Resilience Among Depressed and Burned Out Residents: A Cross-Sectional Study. Acad Pediatr. 2018;(PG-).
95. Trockel M, Bohman B, Lesure E, Hamidi MS, Welle D, Roberts L, et al. A Brief Instrument to Assess Both Burnout and Professional Fulfillment in Physicians: Reliability and Validity, Including Correlation with Self-Reported Medical Errors, in a Sample of Resident and Practicing Physicians. Acad Psychiatry. 2018;42(1 PG-11-24):11–24.
96. van Vendeloo SN, Brand PLP, Verheyen CCPM. Burnout and quality of life among orthopaedic trainees in a modern educational programme: importance of the learning climate. Bone Joint J. 2014;96–B(8 PG-1133-8):1133–8.

Appendix to: Naji L, Singh B, Shah A, et al. Global prevalence of burnout among postgraduate medical trainees: a systematic review and meta-regression.
CMAJ Open 2021. DOI:10.9778/cmajo.20200068.

97. Prins JT, Hoekstra-Weebers J, van de Wiel HBM, Gazendam-Donofrio SM, Sprangers F, Jaspers FCA. Burnout among Dutch medical residents. Int J Behav Med. 2007;14(3 PG-119-125):119–25.
98. Prins JT, Hoekstra-Weebers JEHM, Gazendam-Donofrio SM, Dillingh GS, Bakker AB, Huisman M, et al. Burnout and engagement among resident doctors in the Netherlands: a national study. Med Educ. 2010;44(3 PG-236-47):236–47.
99. van der Wal RAB, Bucx MJL, Hendriks JCM, Scheffer GJ, Prins JB. Psychological distress, burnout and personality traits in Dutch anaesthesiologists A survey. Eur J Anaesthesiol. 2016;33(3 PG-179-186):179–86.
100. van Vendeloo SN, Prins DJ, Verheyen C, Prins JT, van den Heijkant F, van der Heijden FMM, et al. The learning environment and resident burnout: a national study. Perspect Med Educ. 2018;7(2 PG-120-125):120–5.
101. van Vendeloo SN, Godderis L, Brand PLP, Verheyen K, Rowell SA, Hoekstra H. Resident burnout: evaluating the role of the learning environment. Bmc Med Educ. 2018;18(PG-).
102. Block L, Wu AW, Feldman L, Yeh H-C, Desai S V. Residency schedule, burnout and patient care among first-year residents. Postgrad Med J. 2013;89(1055 PG-495-500):495–500.
103. Lebares CC, Guvva E V, Ascher NL, O'Sullivan PS, Harris HW, Epel ES. Burnout and Stress Among US Surgery Residents: Psychological Distress and Resilience. J Am Coll Surg. 2018;226(1 PG-80-90):80–90.
104. Shakir HJ, McPheeters MJ, Shallwani H, Pittari JE, Reynolds RM. The Prevalence of Burnout Among US Neurosurgery Residents. Neurosurgery. 2017;(PG-).
105. Huggard P, Dixon R. "Tired of caring": The impact of caring on resident doctors. Australas J Disaster Trauma Stud. 2011;2011(3 PG-105-111):105–11.
106. Low JM, Tan MY, See KC, Aw MM. Sleep, activity and fatigue reported by postgraduate year 1 residents: a prospective cohort study comparing the effects of night-float versus traditional overnight on-call. Singapore Med J. 2018;(PG-).
107. Markwell AL, Wainer Z. The health and wellbeing of junior doctors: insights from a national survey. Med J Aust. 2009;191(8 PG-441-4):441–4.
108. Cooke GP, Doust JA, Steele MC. A survey of resilience, burnout, and tolerance of uncertainty in Australian general practice registrars. BMC Med Educ. 2013;13(PG-2):2.
109. Kealy D, Halli P, Ogrodniczuk JS, Hadjipavlou G. Burnout among Canadian Psychiatry Residents: A National Survey. Can J Psychiatry. 2016;61(11 PG-732-736):732–6.
110. Lambden JP, Chamberlin P, Kozlov E, Lief L, Berlin DA, Pelissier LA, et al. Association of Perceived Futile or Potentially Inappropriate Care With Burnout and Thoughts of Quitting Among Health-Care Providers. Am J Hosp Palliat Care. 2018;(PG-1049909118792517):1049909118792517.
111. Leach PK, Nygaard RM, Chipman JG, Brunsvold ME, Marek AP. Impostor Phenomenon and Burnout in General

Surgeons and General Surgery Residents. J Surg Educ. 2018;(PG-).
112. Raviola G, Machoki M, Mwaikambo E, Good MJD. HIV, disease plague, demoralization and "burnout": resident experience of the medical profession in Nairobi, Kenya. Cult Med Psychiatry. 2002 Mar;26(1):55–86.
113. Robertson SL, Robinson MD, Reid A. Electronic Health Record Effects on Work-Life Balance and Burnout Within the I3 Population Collaborative. J Grad Med Educ. 2017;9(4 PG-479-484):479–84.
114. Schweitzer B. Stress and burnout in junior doctors. S Afr Med J. 1994;84(6 PG-352-4):352–4.

Appendix to: Naji L, Singh B, Shah A, et al. Global prevalence of burnout among postgraduate medical trainees: a systematic review and meta-regression.
CMAJ Open 2021. DOI:10.9778/cmajo.20200068.