

*The Association Between Adverse
Childhood Experiences and Burnout in a
Regional Sample of Physicians*

**Peter Yellowlees, Lindsay Coate, Rajiv
Misquitta, Aileen E. Wetzel & Michelle
Burke Parish**

Academic Psychiatry

ISSN 1042-9670

Acad Psychiatry

DOI 10.1007/s40596-020-01381-z



Your article is protected by copyright and all rights are held exclusively by Academic Psychiatry. This e-offprint is for personal use only and shall not be self-archived in electronic repositories. If you wish to self-archive your article, please use the accepted manuscript version for posting on your own website. You may further deposit the accepted manuscript version in any repository, provided it is only made publicly available 12 months after official publication or later and provided acknowledgement is given to the original source of publication and a link is inserted to the published article on Springer's website. The link must be accompanied by the following text: "The final publication is available at link.springer.com".



The Association Between Adverse Childhood Experiences and Burnout in a Regional Sample of Physicians

Peter Yellowlees¹ · Lindsay Coate² · Rajiv Misquitta³ · Aileen E. Wetzel² · Michelle Burke Parish¹

Received: 3 March 2020 / Accepted: 1 December 2020

© Academic Psychiatry 2021

Abstract

Objective Little research has occurred in physicians on the prevalence of adverse childhood experiences (ACEs) and their potential correlation with burnout. The authors hypothesized that there would be a relationship between burnout levels and ACE scores, with physicians reporting more burnout being likely to have higher ACE scores.

Methods Three hundred physicians completed the ten-question ACE scale and two burnout scales, the Mini-Z, and two items from the Maslach Burnout Inventory.

Results One hundred and thirty eight (46%) of the physicians were positive on one or the other of the two burnout measures, and 49% of the respondents were positive for at least one ACE, while 9% were positive for four or more ACEs. The most common ACEs reported by the group were having a family member being depressed, being mentally ill, or attempting suicide (22%). The burnout measures correlated strongly with each other ($r = 0.68, p < .001$), and separate logistic regression models revealed that the physicians with an ACE score of 4 or more had more than two and half times the risk of burnout on either burnout scale measured.

Conclusions In this group of physicians, almost half reported experiencing ACEs, and half reported symptoms of burnout. The research hypothesis, which physicians reporting more burnout would be more likely to have higher ACE scores, was supported. It is possible that ACEs are a vulnerability factor in physicians for the development of burnout. This possibility and potential protective factors should be further studied.

Keywords Adverse childhood experiences · Burnout · Physician wellness · Work-life balance

Physician burnout is complex and has many causes and symptoms. With the unprecedented change in the health care delivery system in the USA, many physicians feel that their role as healers, comforters, and listeners is diminished [1]. Physician burnout and depression affect all areas of the health care delivery system, and symptoms of burnout have been linked to increased medical errors, reduced quality of care, and greater patient dissatisfaction [2]. High levels of burnout are also related to high physician turnover, which further exacerbates physician shortages, thus affecting patient access to health care [3, 4]. Finally, multiple studies over the last 20 years have shown

that physicians' suicide rates are higher than those of members of the general population [5]. These findings emphasize the need for structured and systemic improvements to the work-life balance and the overall well-being of physicians [6, 7].

Physician well-being can be broken down into three domains: personal resiliency, culture of wellness, and efficiency of practice [8]. It is widely acknowledged that the culture of wellness and efficiency of practice are best addressed at the systemic level, such as by the medical group, hospital, or health system [9]. With respect to personal resiliency, we know that at entry to medical school in the USA, medical students are more resilient and less depressed than equivalent non-medical graduate students [10] but that almost one third of medical students globally are affected by depression, with low treatment rates [11]. There is also anecdotal evidence reported by medical school admission committees that many medical students show high levels of personal resiliency in overcoming substantial adverse childhood experiences

✉ Peter Yellowlees
pmyellowlees@ucdavis.edu

¹ University of California Davis, Sacramento, CA, USA

² Sierra Sacramento Valley Medical Society, Sacramento, CA, USA

³ Kaiser Permanente Medical Group, Sacramento, CA, USA

(ACEs) and social disadvantages to gain entry to medical school.

Despite these findings, relatively little research has occurred in relation to the impact of ACEs on physicians and on their potential correlation with burnout. One study has suggested a potential link in physicians between childhood adversity and later practice boundary violations [12], while another study found that up to 42% of female physicians and 24% of male physicians had some experience of lifetime personal abuse, including witnessing violence between their parents [13]. There are two small studies of ACEs in medical students [14] and veterinary students [15], with both studies finding similar rates of ACEs to the general population.

Over 20 years of research, the current gold standard ACE measure of ten questions [16, 17] examines two major domains, namely, ACEs that are either personal or family related. The five personal questions ask about physical abuse, verbal abuse, sexual abuse, physical neglect, and emotional neglect. The five family-related questions ask about a parent who is an alcoholic, a mother who is a victim of domestic violence, a family member in jail, a family member diagnosed with mental illness, and the disappearance of a parent through divorce, death, or abandonment. Over 20 years of multiple ACE investigations [18] have shown the following:

- Childhood trauma is very common across all socioeconomic groups, with up to 64% of the population having at least one ACE and 12.5% having four or more.
- There is a direct link between childhood trauma and adult onset of chronic physical disease, as well as depression, suicide, being violent, and being a victim of violence.
- The more types of trauma experienced in childhood, the higher the risk of later health, social, and emotional problems, so childhood trauma can be seen as a vulnerability marker for later dysfunction.
- It is likely that exposure to early traumatic stress leads to abnormal brain development, affecting socio-cognitive skills, which can lead to later poor life decisions and choices in health habits.

As part of a larger study of up to 6000 physicians by a regional organization, we investigated the prevalence of ACEs and their relationship with burnout in an unselected group of physicians from multiple regional medical groups. We hypothesized that there would be a relationship between burnout levels and ACE scores, with physicians reporting more burnout being likely to have higher ACE scores.

Methods

The survey was deployed to 4388 practicing physicians in four Northern California counties over a 6-week period in

2018. Participants were incentivized with a \$20 gift card. A sample of 502 (11.44%) physicians anonymously completed the survey developed by a subcommittee of physicians and medical students. Results of the full survey, which included two validated burnout measures, are reported elsewhere [19].

A subset of 300 of the physician participants also voluntarily completed the ten-item ACE questionnaire [16, 17] and is the focus of this paper. The ACE survey return rate for the sample was 6%. Thus, these results are not representative of a broad population of physicians but of this small, self-selected sample.

The burnout measures [20] were the Mini-Z, which we screened positive if the respondents rated themselves as “definitely burning out” or higher in the past 2 weeks. The Mini-Z single-item burnout question has been validated externally against the Maslach Burnout Inventory (MBI), demonstrating a positive correlation ($r = 0.64$) of the single question with emotion exhaustion as measured by the MBI ($r = 0.64$) [21]. Two questions from the MBI, questions 8 and 10, or the Emotional Exhaustion (EE) Scale, were collected where a positive response of at least “a few times a week” to either question was scored as positive for burnout on the MBI. A meta-analysis of 45 empirical studies revealed that the two-item EE MBI had an average Cronbach’s alpha coefficient of 0.88 for this dimension [22]. The two burnout measures (the Mini-Z and MBI) are among those recommended by the National Academy of Medicine Collaborative on clinician well-being and resilience as validated instruments to measure burnout [23].

In the current sample, the MBI EE scale and the Mini-Z correlated well with each other ($\phi = \text{Cohen's } w = \text{fourfold point correlation} = 0.68, p < .001, X^2(1) = 136.96, p < .001$). The MBI and the Mini-Z were treated as outcome measures in separate logistic regression analysis to determine if ACE scores could predict burnout on either measure. The Mini-Z and the MBI items were coded into binary variables (0 = negative for burnout on any item and 1 = positive for burnout on at least 1 item). The data were analyzed using STATA statistical software.

Because of the important findings (potentially appropriate for dissemination) that emerged from this quality improvement project involving a one-time, voluntary, anonymous survey, review was sought from the University of California Davis Institutional Review Board, which confirmed that the procedures described would have been designated as exempt research.

Results

Burnout in the Sample

A total of 300 physicians completed the ten-question ACE scale and the rest of the questionnaire, including the two

burnout scales (Table 1). They comprised 156 males and 144 females from a wide range of medical specialties, with two thirds aged between 36 and 55 years old. There was also no difference in burnout, across gender or the age ranges of the physicians (Table 1). The burnout scores for physicians showed positive burnout responses of 38% on both measures, which is similar to the rate in the larger study from which this group was taken [19].

ACE Scores in the Sample

Physicians as a group had less experience of any ACEs than the non-physician populations studied in the literature, with 49% in the study sample compared with 64% in other studies [16–18]. Nine percent of the physicians were positive for four or more ACEs. The most common ACEs reported by the group were having a family member being depressed, being mentally ill, or attempting suicide (22%) or living with someone who was a problem drinker or alcoholic or who used street drugs (18%).

ACE as a Predictor for Burnout

The logistic regression analyses (Table 2) revealed that those with four or more ACEs had 2.67 times the odds of reporting burnout on the MBI scale and 2.75 the odds of burnout as measured by the Mini-Z scale.

Discussion

There are two main findings from this study. Firstly, physicians as a group had significant exposure to ACEs in this small

study with a survey return rate of only 6%, in itself a significant possible confounding variable. This rate is less than examples of non-physician populations studied in the literature, where up to 64% of respondents having exposure to ACEs have been reported [16–18]. A rate of 1 in 2 physicians exposed to at least one ACE is, however, significant in itself, given that we expect physicians to maintain their health and well-being in order to be able to be properly fit to treat patients. More seriously, 9% of physicians were exposed to more than four ACEs, putting them at increased long-term risk of developing chronic physical and psychiatric disorders and, in this study, of showing signs of burnout. This level of exposure to ACEs may not be a surprise to those of us who have long treated physicians as patients and clearly needs more investigation.

Secondly, this study shows that the odds of developing burnout increase with higher rates of adverse childhood experiences, which is in accord with the literature [16–18], where a dose-response association between numbers of ACEs and long-term adverse effects have been shown. This is the first study in physicians examining the potential association between ACE scores and the later experience of burnout. The logistic regression findings demonstrate that the more ACEs that one has, the higher the odds of experiencing burnout many years later. We did not examine other potential confounding factors, such as the presence of substance use disorders or chronic medical illness. Given the strong association in the literature [16–18] of increasing of ACEs and a variety of chronic medical and psychiatric disorders, it seems reasonable to propose that ACEs are a vulnerability factor in physician populations for the development of later burnout. While this study needs to be replicated in larger populations of physicians, protective factors such as resilience should also be

Table 1 Characteristics of the sample on the MBI and the Mini-Z Scale

	Respondents, No. (%)				
	Total (N = 300)	MBI		Mini-Z	
		Burnout positive	Burnout negative	Burnout positive	Burnout negative
Age, year					
25 to 35	14(4.67)	8(9.96)	6(3.21)	6(5.22)	8(4.28)
36 to 45	105(35.00)	41(35.65)	64(34.22)	43(37.39)	62(33.16)
46 to 55	86(28.67)	35(30.43)	53(28.34)	34(29.57)	54(28.88)
56 to 65	70(23.33)	23(20.0)	47(25.13)	26(22.61)	44(23.53)
66+	25(8.33)	8(6.96)	17(9.09)	6(5.22)	19(10.16)
Gender					
Male	156 (52.00)	53(46.09)	84(44.92)	53(46.09)	84(44.92)
Female	144(48.00)	62(53.91)	103(55.08)	62(53.91)	103(55.08)

No significant difference between the MBI or the Mini Z scale and age group or gender

MBI Maslach Burnout Inventory, MINI-Z Mini Z burnout survey

Table 2 Results of logistic regression model to assess how adverse childhood experience predicts burnout on the MBI and Mini-Z scales in physicians ($N = 300$)

Predictor	Odds ratio	MBI				MINI-Z				
		Z	SE	P	95% CI for OR	Odds ratio	Z	SE	P	95% CI for OR
ACE = 1	.649	- 1.33	.21	0.182	.3446505–1.224196	.89	- 0.37	.276	0.710	.4845288–1.638126
ACE = 2–3	1.43	1.11	.46	0.265	.7611604–2.699714	1.16	0.48	.38	0.633	.6154119–2.221772
ACE = 4 or more	2.67	2.33	1.12	0.020	1.171169–6.118718	2.75	2.40	1.16	0.016	1.204142–6.297403
Constant	.577	- 3.27	.09	0.001	.4154898–.8021807	.561	- 3.43	.094	0.001	.4033901–.7808148

Model fit using STATA logit command

ACE adverse childhood experience, MBI Maslach Burnout Inventory, MINI-Z Mini Z burnout survey

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

examined. The literature demonstrates high levels of resilience shown at entry to medical school, and the degree to which resilience may mediate this relationship and the potential impact of ACEs on health issues other than burnout should be further studied.

The main confounding variable in this study is whether there was a biased self-selection of those physicians (502 out of a possible group of 4388 regional physicians) who, firstly, took the overall study and, secondly, who elected to complete the ACE questionnaire (300), which was an add-on to the main study, although we know that both groups were broadly demographically similar with all physicians in the region. The ACE questionnaire content and rationale were fully explained to the participants on the survey document, and it is possible that this explanation may have led to some over-selection of physicians with low levels of ACEs, with some high-scoring ACE individuals being reticent to complete the survey.

The results of this study, with physicians reporting more burnout being likely to have higher ACE scores, have significant implications for the field of physician health and well-being and potentially for other groups of health care providers, especially the association of ACEs and the presence of burnout many years later and the possibility that ACEs are a vulnerability marker for burnout. The study has also found that ACEs are common in physicians and should be addressed in physician well-being programs in future, just as they are being addressed in multiple studies and interventions in other populations.

Finally, this study needs to be replicated across multiple health provider groups to examine the impact of childhood trauma on health professionals generally. This should ensure that physicians and other health professionals of the future, unlike our current generations of physicians, be given extra help, support, and counseling from the start of their careers if they have a vulnerability related to ACEs. This assistance could reduce their long-term vulnerability to burnout and a variety of chronic medical and psychiatric disorders and thereby improve their well-being.

Acknowledgments We wish to thank all members of the Sierra Sacramento Valley Medical Society Advisory Committee for the Joy of Medicine Program for their input and support.

Funding This publication was made possible by a grant from The Physicians Foundation and by funding from the Department of Psychiatry, University of California Davis.

Compliance with ethical standards Reviewed retrospectively by University of California Davis IRB and deemed “exempt.”

Disclosures On behalf of all authors, the corresponding author states that there is no conflict of interest.

References

1. Shanafelt TD, Dyrbye LN, West CP. Addressing physician burnout: the way forward. *Jama*. 2017;317(9):901–2.
2. Slavin SJ. Medical student mental health: culture, environment, and the need for change. *Jama*. 2016;316(21):2195–6.
3. Scheepers RA, Boerebach BC, Arah OA, Heineman MJ, Lombarts KM. A systematic review of the impact of physicians' occupational well-being on the quality of patient care. *Int J Behav Med*. 2015;22(6):683–98.
4. Berg S. How much physician burnout is costing your organization. 2018. www.ama-assn.org. Accessed Nov 2nd 2020.
5. Shanafelt TD, Mungo M, Schmitgen J, Storz KA, Reeves D, Hayes SN, et al. Longitudinal study evaluating the association between physician burnout and changes in professional work effort. *Mayo Clinic Proceedings*. 2016;91(4):422–31. <https://doi.org/10.1016/j.mayocp.2016.02.001>.
6. Han S, Shanafelt TD, Sinsky CA, Awad KM, Dyrbye LN, Fiscus LC, et al. Estimating the attributable cost of physician burnout in the United States. *Annals of internal medicine*. 2019;170(11):784–90.
7. Yellowlees P. Physician suicide: cases and commentaries. Washington DC: American Psychiatric Publishing Incorporated; 2018.
8. Bohman B, Dyrbye L, Sinsky CA, et al. Physician well-being: the reciprocity of practice efficiency, culture of wellness, and personal resilience. *NEJM Catalyst*. 2017;3(4). <https://catalyst.nejm.org/doi/full/10.1056/CAT.17.0429> Accessed Nov 2nd 2020
9. Shanafelt TD, Noseworthy JH. Executive leadership and physician well-being: nine organizational strategies to

- promote engagement and reduce burnout. *Mayo Clin Proc.* 2017;92(1):129–46. <https://doi.org/10.1016/j.mayocp.2016.10.004> www.mayoclinicproceedings.org.
10. Brazeau CM, Shanafelt T, Durning SJ, et al. Distress among matriculating medical students relative to the general population. *Acad Med.* 2014;89(11):1520–5.
 11. Puthran R, Zhang MW, Tam WW, Ho RC. Prevalence of depression amongst medical students: a meta-analysis. *Med Educ.* 2016;50(4):456–68.
 12. MacDonald K, Sciolla AF, Folsom D, Bazzo D, Searles C, Moutier C, et al. Individual risk factors for physician boundary violations: the role of attachment style, childhood trauma and maladaptive beliefs. *Gen Hosp Psychiatry.* 2015;37(1):81–8.
 13. Candib LM, Savageau JA, Weinreb LF, Reed GW. Inquiring into our past: when the doctor is a survivor of abuse. *Fam Med.* 2012;44(6):416–24.
 14. Sciolla AF, Wilkes MS, Griffin EJ. Adverse childhood experiences in medical students: implications for wellness. *Acad Psychiatry.* 2019;43(4):369–74.
 15. Strand EB, Brandt J, Rogers K, Fonken L, Chun R, Conlon P, et al. Adverse childhood experiences among veterinary medical students: a multi-site study. *J Vet Med Educ.* 2017;44(2):260–7.
 16. Felitti VJ, Anda RF, Nordenberg D, et al. Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *Am J Prev Med.* 1998;14(4):245–58.
 17. Centers for Disease Control and Prevention. Violence Prevention. Adverse Childhood Experiences. https://www.cdc.gov/violenceprevention/childabuseandneglect/acestudy/index.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fviolenceprevention%2Facestudy%2Findex.html. Accessed 30 July 2019.
 18. Aces Too High. <http://www.acestoohigh.com>. Accessed 2 Nov 2020.
 19. Joy of Medicine: Assessing Physician Well-Being in the Sacramento Region. <https://drive.google.com/file/d/1idbldud-f4VOYpDhrTIRdrVY4DUBhsy/view>. Accessed 2 Nov 2020.
 20. National Academy of Medicine. Valid and reliable survey instruments to measure burnout, well-being, and other work-related dimensions. <https://nam.edu/valid-reliable-survey-instruments-measure-burnout-well-work-related-dimensions/>. Accessed 31 July 2019.
 21. Rohland BM, Kruse GR, Rohrer JE. Validation of a single-item measure of burnout against the Maslach Burnout Inventory among physicians. *Stress Health: J Int Soc Investig Stress.* 2004;20(2):75–9.
 22. Aguayo R, Vargas C, Emilia I, Lozano LM. A meta-analytic reliability generalization study of the Maslach Burnout Inventory. *Int J Clin Health Psychol.* 2011;11(2):343–61.
 23. National Academy of Medicine Collaborative on clinician well-being and resilience https://nam.edu/initiatives/clinician-resilience-and-well-being/?gclid=CjwKCAiA-f78BRBbEiwATKRRBKW-SIk-Z1SjOkp4KRToMyhu4f46mskb4wISFHJIXQwyGloOsmplxoCTNkQAvD_BwE. Accessed 2 Nov 2020

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.