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ORIGINAL ARTICLE

Contributors to and consequences of burnout among clinical genetic counselors in the United States

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Abstract

Prior research has found that many genetic counselors (GCs) experience burnout. Studies of other clinicians have demonstrated that burnout can have significant detrimental consequences for clinicians, patients, and the healthcare system. We sought to explore the prevalence of, contributors to, and consequences of burnout among GCs. We performed a secondary data analysis of baseline data from Me-GC, a randomized controlled trial of meditation for GCs. We applied a systems model of burnout proposed by the National Academy of Medicine (NAM), which depicts burnout arising from a combination of contributors that include both work system and individual mediating factors, and then leading to consequences. Validated self-report scales were used to measure burnout and most contributors and consequences. Female and white GCs were over-represented in our sample. Over half (57.2%) of the 397 participants had Professional Fulfillment Index scores indicative of burnout. Multiple potential contributors were associated with burnout, consistent with its known multifactorial nature. Among work system factors, higher levels of burnout were associated with insufficient administrative support, lack of autonomy, and not feeling valued by non-GC colleagues. Individual mediating factors associated with greater burnout included higher levels of anxiety, depression, and stress. Participants with lower levels of burnout reported greater mindfulness, resilience, and use of professional self-care behaviors. Among variables categorized as consequences, higher levels of burnout were associated with lower levels of empathy, counseling alliance, and positive unconditional regard, as well as higher reactive distress, and a greater desire to reduce the amount of time spent on clinical care. Given the prevalence and potential consequences of burnout observed here, it is imperative that the field take steps to mitigate burnout risk.

KEYWORDS

burnout, genetic counselors, mental health, professional development, professional well-being, stress, workforce

[Correction added on 01 December, 2021, after first online publication: Italicized sentence was removed from the footnote of Table 2 from the article.]

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1 | INTRODUCTION

Multiple studies have found that more than half of GCs experience burnout (Allsbrook et al., 2016; Bernhardt et al., 2009; Johnstone et al., 2016; Udipi et al., 2008). GCs are certainly not alone in experiencing burnout; a broad and deep literature on clinician burnout has accrued in recent decades, revealing its prevalence, origins, and impact (National Academy of Medicine, 2019).

The concept of burnout was first used by Freudenberger to denote a set of physical and behavioral signs in worn out helping professionals. It was described as the clinician 'becoming exhausted by making excessive demands on energy, strength, or resources' in the workplace (Freudenberger, 1974, p. 159). Maslach and colleagues went on to conceptualize burnout as a syndrome comprising three dimensions: emotional exhaustion, cynicism or depersonalization, and reduced sense of accomplishment at work (Maslach, 1998; Maslach & Jackson, 1981). Burnout is associated with poor mental health and quality of life (National Academy of Medicine, 2019; Niconchuk & Hyman, 2020). Yet, burnout's impact extends far beyond the suffering of the individual clinician. Studies on physicians, nurses, and other non-genetics clinicians have revealed the negative consequences of burnout on patients and the healthcare system (National Academy of Medicine, 2019; Niconchuk & Hyman, 2020). These include, but are not limited to, decreased patient satisfaction, increased medical errors and safety issues, and increased patient mortality. Burnout is estimated to cost the American healthcare system over \$4 billion a year, stemming from poor medical care as well as clinician attrition and absenteeism (National Academy of Medicine, 2019).

Recognizing the importance of addressing burnout, the National Academy of Medicine (NAM) convened a multidisciplinary committee to draft a report on clinician burnout (National Academy of Medicine, 2019). In addition to detailing the origins and impact of burnout among clinicians, the committee synthesized the evidence into a model that depicts the systems nature of burnout (Figure 1). The report delineates multiple work system factors (e.g., excessive workload, inadequate staffing, organizational culture) that combine with individual mediating factors (e.g., personality, temperament, coping) to lead to the development of burnout. The report stresses the importance of understanding the origins of burnout in order to inform strategies to prevent and treat burnout.

Little work has been done to gain insight into the correlates of burnout among GCs. The handful of studies that have been done have identified both work system (e.g., support staff, patient volume, vocational strain) and individual mediating factors (e.g., ineffective coping, mindfulness, lack of meaning in care) that may contribute to GC burnout (Allsbrook et al., 2016; Bernhardt et al., 2009; Johnstone et al., 2016; Silver et al., 2018; Udipi et al., 2008). To date, no studies have examined the consequences of burnout among GCs. A more robust understanding of GC burnout is needed to inform strategies to address burnout in our field. This is particularly critical given the rapidly increasing demand for our services and the fact that burnout is the most common reason GCs consider leaving the field (National Society

What is known about this topic

Prior studies have found that GCs often experience burnout; however, little research has been done on the contributors to and consequences of GC burnout. Research on burnout in other clinicians has revealed work system and individual mediating factors that contribute to burnout, as well as consequences for the clinician, patients, and the healthcare system.

What this paper adds to the topic

Burnout is prevalent and multifactorial among GCs, with multiple work system and individual mediating factors contributing, many of which are modifiable. Potential consequences of burnout among genetic counselors include lower levels of key determinants of counseling effectiveness, as well as a greater desire to reduce time spent on clinical care.

of Genetic Counselors, 2020). Given this need, we sought to explore possible contributors to and consequences of burnout among GCs.

2 | METHODS

This was a secondary data analysis of baseline data from the Me-GC study (the parent study), a randomized controlled trial of meditation for genetic counselors (additional details can be found on ClinicalTrials.gov, identifier: NCT03723018). The present study was cross-sectional and focused on variables available in the Me-GC baseline dataset. Conceptualization of variables as contributors to, or consequences of, burnout was informed by prior literature and the NAM systems model (Figure 1). Potential contributors included both work system factors (autonomy, administrative support, feeling valued by colleagues, percentage of time spent on clinical care and with patients) and individual mediating factors (age, year of graduation, anxiety, stress, depression, mindfulness, self-care, resilience). Possible consequences included variables critical to effective counseling (empathy, reactive distress, unconditional positive regard, counseling alliance) and desire to reduce time spent on clinical care.

Participants were invited to take part in the parent study (Me-GC) via NSGC e-blasts, NSGC forum posts, Twitter, and emails to participants in a prior study by our group (Silver et al., 2018). Recruitment materials noted that the study was on poor professional well-being, including burnout. Eligibility criteria included self-described English proficiency and being a genetic counselor in the United States who counsels patients. Recruitment occurred from September 2019 to July 2020. Data on all GC participants in the parent study were used in the current study.

Surveys were administered via REDcap (Harris et al., 2019). Participants completed one main survey plus up to 5 'post-appointment' surveys, which were filled out after genetic counseling

A SYSTEMS MODEL OF CLINICIAN BURNOUT AND PROFESSIONAL WELL-BEING

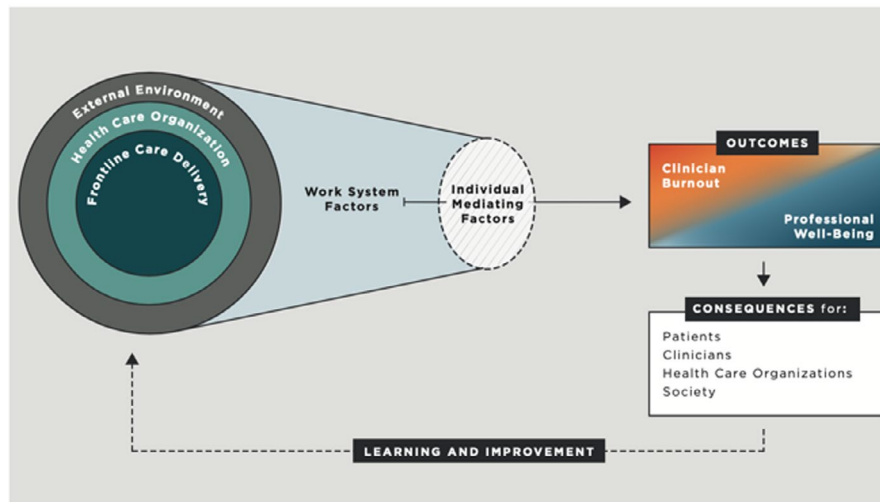


FIGURE 1 Systems model of clinician burnout. Model of clinician burnout developed by a multidisciplinary committee convened by the National Academy of Medicine (National Academy of Medicine, 2019), based on the extant evidence on clinician burnout and designed to demonstrate how burnout is a systems issue, with multiple layers of work system factors (on the left, in concentric circles) combining with individual mediating factors (center) to lead to burnout. Burnout in turn leads to a myriad of consequences for clinicians, patients, and the healthcare system. Figure reproduced with permission from the National Academy Press

appointments. These latter surveys included measures related to interaction with a patient. Participants were also texted ecological momentary assessment (EMA) surveys at semi-random times during three work days (Shiffman et al., 2008). These brief surveys asked about current-moment experience, including burnout. The validated instruments used in data collection are briefly outlined here, with additional details presented in Table S1 (psychometric properties, mode of administration, cutoffs, number of items, references). Questions created for this study are listed in Table S2.

2.1 | Burnout

Burnout was measured using the Professional Fulfillment Index (PFI) (Trockel et al., 2018). The PFI is a measure of clinician well-being that was designed for sensitivity to change due to interventions. It is briefer than other measures of professional well-being yet maintains convergent validity with them. The PFI was the measure of burnout used for all analyses of burnout's association with consequences and contributors. To further characterize GC burnout, we also used measurement of momentary experiences of burnout from the EMA surveys. A single EMA item was created for this study (Table S2). This was only used for descriptive purposes and was not included in the analyses of consequences and contributors.

2.2 | Contributors—individual mediating

Age and year of graduation were each measured with a single item drafted by the authors for this study (Table S2). Anxiety

and depression were measured with the Hospital Anxiety and Depression Scale (HADS). The Perceived Stress Scale (PSS) was used to measure stress. Resilience was measured with the Connor-Davidson Resilience Scale (CDR-RISC-10), which measures resilience by assessing resources or qualities that facilitate positive adaptations to difficulty. Mindfulness was measured with the Five Factors Mindfulness Questionnaire (FFMQ), which captures varying components of mindfulness and was developed from other existing mindfulness measures. All five subscales were used (observing, describing, acting with awareness, non-judging of inner experience, non-reactivity to inner experience). The Professional Self-Care Scale measures multiple domains of career-specific self-care behaviors. All five subscales were used (professional support, professional development, life balance, cognitive awareness, daily balance).

2.3 | Contributors—work system

Single items were created by the authors to assess administrative support, autonomy, feeling valued, time on clinical care, and time on direct patient care (Table S2).

2.4 | Consequences

The Interpersonal Reactivity Index (IRI) measures various aspects of empathy and related constructs. The personal distress subscale of the IRI was used to measure reactive distress, which is discomfort and distress experienced in response to another person's negative experiences. The perspective taking subscale of

the IRI measures cognitive empathy, which is the intellectual or imaginative aspect of empathy that allow one to surmise the state of another person's mind. Affective empathy, measured with the emotional concern subscale, refers to the emotional or feeling aspect of empathy. These are global measures of empathy; they are anchored on the participant's general experiences, opposed to interaction with a specific patient. The Barrett-Lennard Relationship Inventory (BLRI) was used as a patient-specific measure of empathy, as well as unconditional positive regard. The BLRI was developed to measure Carl Rogers' core conditions and is completed with reference to a specific patient. It has been used in many psychotherapy studies and has been found to correlate with patient outcomes. The genetic counselor's perception of the counseling alliance was measured using the bond subscale of the Working Alliance Inventory (WAI). The WAI is frequently used to measure the counseling relationship in psychotherapy research and has recently been used in genetic counseling research. Patient-specific empathy (BLRI), unconditional positive regard (BLRI), and counseling alliance (WAI) were measured on up to five consecutive patient encounters. This was done to increase the representativeness of the scores and minimize the impact of outlier patient interactions. Although leaving the field (or clinical care) is often used to measure workforce sustainability, we needed a more sensitive measure because of the short time-frame of the intervention period in the parent study. As such, we developed an item to measure participant's desire to reduce the amount of time spent on clinical care (Table S2).

For all analyses, alpha was set at 0.05, due to the exploratory nature of the work and the early stage of research on this topic in the genetic counseling field. In analyzing contributors, we first examined bivariate relationships with burnout, using Pearson correlations. To assess independent relationships between contributors and burnout, we used hierarchical linear regression (Table S3). Variables with the strongest evidence for association with burnout in prior literature and our bivariate analyses were entered first. Each subsequent group of variables added to the model had successively weaker evidence. Multiple imputation was used to replace missing data prior to model building. Missing data were imputed in SPSS using the fully conditional specification (FCS), which is an iterative Markov Chain Monte Carlo (MCMC) method that is appropriate for monotone (or arbitrary) missing data. We generated five imputed datasets using 10 iterations. To estimate the strength of the independent relationship with burnout for each contributor that was significant in the final model, we calculated *f*-squared, a measure of standardized effect size.

We performed Pearson correlations to analyze the relationships between burnout and consequence variables that were measured only once (global measure of empathy (IRI), reactive distress (IRI), desire to reduce time on clinical care). As previously noted, patient-specific empathy, unconditional positive regard, and counseling alliance were measured on up to five patient interactions per participant. Given multiple measurements of these variables, mixed effects

models were used to assess the relationship between each of these variables and burnout. This approach incorporates multiple measurements of the consequence variable in assessing its association with burnout. Standardized effect sizes cannot be estimated from mixed effects models, so Pearson correlations were used as rough estimates of the strength of the relationship between burnout and these consequences.

3 | RESULTS

A total of 397 participants from the parent study were included in the current study. Demographics are displayed in Table 1. Compared to the NSGC Professional Status Survey, there were more white (90% versus 94.2%; $p = 0.02$) and female (95% versus 97.7%; $p = 0.01$) GCs in our sample (National Society of Genetic Counselors, 2020). Descriptive statistics for contributor and consequence variables are displayed in Table S4. While not directly related to our research question, it is notable that 55.9% (222/397) had clinical levels of anxiety on the HADS. Most participants (315/397 (79.3%)) were recruited prior to the coronavirus pandemic. Key variables did not differ between those recruited before and during the pandemic, including burnout, stress, anxiety, and depression (data not shown). The mean PFI burnout score was 15.4 (standard deviation 6.7). Based on these scores, 57.2% (227/397) of participants were burnt out. Averaging across EMA surveys, 60.7% (204/336) of participants reported momentary experiences of burnout. PFI burnout scores were used for the remainder of the analyses.

3.1 | Contributors

3.1.1 | Individual mediating factors

Most of the individual mediating factors studied were associated with burnout in bivariate analyses (Table 2). All mental health variables and self-care subscales were associated with burnout. Higher scores on every mindfulness subscale except observing were associated with lower burnout scores. Age and year of graduation were not associated with burnout. When controlling for the impact of all other variables in the multivariate linear regression model, the individual mediating factors that remained significant included depression, stress, the acting with awareness component of mindfulness, and the professional development and life balance aspects of self-care.

3.1.2 | Work system factors

In bivariate analyses, greater administrative support, autonomy, and feeling valued by non-GC colleagues were associated with lower

TABLE 1 Participant characteristics

	n (%)	Mean (SD)
Age		33.1 (7.5)
Year of Graduation		2012 (6.9)
Gender ^a		
Female	388 (97.7%)	
Male	8 (2.0%)	
Race ^b		
White	374 (94.2%)	
Asian	24 (6.0%)	
Hispanic/Latino	7 (1.8%)	
African American/Black	2 (0.5%)	
Other	4 (1.0%)	
Ethnicity		
Hispanic/Latino	7 (1.8%)	
Non-Hispanic/Latino	390 (98.2%)	

^aTransgender and non-binary options were available but not selected.

^bChoose all that apply.

levels of burnout (Table 2). Neither percentage of time spent on clinical care or percentage of time spent in direct interaction with patients were associated with burnout. In multivariate analyses, only having sufficient administrative support had an independent association with burnout, with greater administrative support associated with lower burnout scores.

3.1.3 | Multivariate linear regression

Prior to multivariate regression, missing data were imputed; there were minimal missing data (see Table S5 for counts and percentages of missing data). Significant contributor variables in the multivariate linear regression are noted in domain-specific sections above and in Table 2. The model explained 42.0% of the variance in burnout. Of note, the first step in model building accounted for 36.5% of the variance in burnout; this step included stress, depression, and anxiety. In the final model, effect sizes for all significant variables were small.

3.2 | Consequences

3.2.1 | Counseling effectiveness

Global measures of affective and cognitive empathy (IRI) were not associated with burnout; however, the patient-specific measure of empathy (BLRI) was, with higher burnout scores linked to lower empathy scores (Table 3). Reactive distress was positively correlated with burnout. Patient-specific measures of unconditionality, positive regard, and strength of the counseling alliance were all negatively associated with burnout.

3.2.2 | Workforce sustainability

Greater desire to reduce time spent on clinical care was significantly correlated with greater burnout (Table 3). In addition, GCs who reported that poor professional well-being contributed to their desire to reduce their clinical time had worse burnout scores.

Effect sizes for all consequence variables were small (Table 3).

Figure 2 depicts our findings, organized using the conceptual framework of the NAM systems model of burnout.

4 | DISCUSSION

We observed a high prevalence of burnout among GCs (57.2%), comparable to what has been seen in prior studies on GC burnout and, notably, higher than in nurses and physicians (35%–45%) (Allsbrook et al., 2016; Injeyan et al., 2011; Johnstone et al., 2016; Lee et al., 2015; National Academy of Medicine, 2019). Among physicians, more women experience burnout than men (Silver et al., 2019). This gender difference may explain the high rates of burnout in our predominantly female field and in our sample, which has over-representation of female GCs. The over-representation of white GCs in our sample also needs to be considered when interpreting our findings. It is also possible that the higher rate of burnout in GCs than physicians and nurses is attributable to either differences in the scales used to measure burnout or to ascertainment bias in our study.

Multiple contributor variables were associated with burnout, including both individual and work system factors. Our data suggest negative consequences of burnout for both patient care and GC retention, mirroring findings in the broader literature on clinician burnout (National Academy of Medicine, 2019; Niconchuk & Hyman, 2020).

4.1 | Contributors

Our findings confirm prior reported associations between GC burnout and autonomy, feeling valued, anxiety, and mindfulness (Allsbrook et al., 2016; Silver et al., 2019). We also report novel associations with GC burnout, including administrative support, stress, depression, self-care, and resilience. Prior studies variously found that age, year of graduation, and clinical volume were all associated with burnout in GCs (Allsbrook et al., 2016; Bernhardt et al., 2009; Johnstone et al., 2016; Udipi et al., 2008); we did not replicate those findings. Findings on demographic variables have been similarly inconsistent in studies on burnout in other clinicians (National Academy of Medicine, 2019). As for clinical volume, the difference in findings may be due to the specifics of what was measured. We looked at the percentage of time in one's job spent on clinical care, which may reflect whether a GC has a mixed role more than their clinical load or overwork. Prior studies finding an association with burnout examined workload, patients seen per week, hours per week, and role

TABLE 2 Burnout and potential contributors: bivariate correlations and multivariate linear regression

	Bivariate		Multivariate ^a		
	<i>r</i>	<i>p</i>	<i>B</i>	<i>p</i>	<i>f</i> ² [95% CI] ^b
Individual mediating					
Demographics					
Age	-0.059	0.25	-0.047	0.51	
Year of Graduation	0.076	0.13	-0.010	0.90	
Mental health					
Anxiety (HADS)	0.45	0.000**	0.038	0.73	
Depression (HADS)	0.42	0.000**	0.27	0.012*	0.0093 [-0.0084 - 0.028] small
Stress (PSS)	0.59	0.000**	0.47	0.000**	0.064 [0.018 - 0.12] small/med
Resilience (CD-RISC-10)	-0.29	0.000**	0.051	0.44	
Mindfulness (FFMQ)					
Observing	-0.12	0.077	0.085	0.22	
Describing	-0.15	0.002*	-0.001	0.99	
Acting with Awareness	-0.39	0.000**	-0.21	0.001*	0.016 [-0.0070 - 0.041] small
Non-judging of inner experience	-0.31	0.000**	0.003	0.95	
Non-reactivity to inner experience	-0.31	0.000**	-0.034	0.69	
Self-care behaviors (PSCS)					
Professional support	-0.23	0.000**	-0.014	0.83	
Professional development	-0.29	0.000**	-0.26	0.001*	0.017 [-0.0070 - 0.041] small
Life balance	-0.16	0.001*	0.35	0.000**	0.026 [-0.0036 - 0.057] small
Cognitive awareness	-0.26	0.000**	-0.065	0.48	
Daily balance	-0.21	0.000**	-0.17	0.12	
Work system					
Administrative Support	-0.27	0.000**	-0.021	0.022*	0.0085 [-0.0084 - 0.026] small
Autonomy	-0.31	0.000**	-0.006	0.75	
Feeling Valued	-0.34	0.000**	-0.031	0.118	
% Time on clinical care	0.024	0.64	0.017	0.32	
% Time on direct patient care	-0.052	0.33	-0.015	0.34	

CD-RISC-10, The Connor-Davidson Resilience Scale; FFMQ, Five Facet Mindfulness Questionnaire; HADS, Hospital Anxiety and Depression Scale; PSCS, Professional Self-Care Scale; PSS, Perceived Stress Scale.

^aAdjusted *R* square for multivariate linear regression: 0.42.

^bEffect sizes are reported for variable with *p* < 0.05 in multivariate analyses, with the following guideline for interpretation: *f*² ≈ 0.02 as small, *f*² ≈ 0.15 as medium, and *f*² ≈ 0.35 as large.

**p* < 0.05 and ** *p* < 0.001.

overload (job demand versus resources) (Johnstone et al., 2016). While professional self-care activities have not been investigated as a correlate of burnout in the past, the NSGC Professional Status Survey has reported an association with career satisfaction and professional activities (National Society of Genetic Counselors, 2020). This is consistent with the relationship we observed between higher

scores on the professional development subscale of the PSCS and lower burnout scores; most of the items on that subscale refer to engagement in professional activities, communities, and organizations.

The initial step in model building that included stress, depression, and anxiety accounted for most of the variance explained by our multivariate linear regression model of contributors. Since anxiety

TABLE 3 Burnout and potential consequences: correlations and mixed effects regression

	Correlations		Mixed Effects Regression ^a	
	<i>r</i>	<i>p</i>	<i>B</i>	<i>p</i>
Counseling effectiveness				
Global measures ^b				
Reactive distress (IRI)	0.15	0.004*	n/a	n/a
Affective empathy (IRI)	-0.071	0.16	n/a	n/a
Cognitive empathy (IRI)	-0.087	0.084	n/a	n/a
Patient-specific measures ^c				
Empathy (BLRI)	n/a	n/a	-0.17	.000**
Unconditionality (BLRI)	n/a	n/a	-0.25	.000**
Positive Regard (BLRI)	n/a	n/a	-0.17	.000**
Counseling relationship (WAI)	n/a	n/a	-0.016	0.001*
Workforce sustainability				
Desire to reduce time on clinical care	0.30	0.000**	n/a	n/a
Desire to reduce time on clinical care attributed to poor professional well-being	0.36	0.000**	n/a	n/a

Abbreviations: BLRI, Barrett-Lennard Relationship Inventory, IRI, Interpersonal Reactivity Index, WAI, Working Alliance Inventory.

Global measures and workforce sustainability variables were assessed with correlations. Patient-specific measures were assessed with mixed effects regression due to multiple measurements of each variable.

^aVariable-specific effect sizes cannot be determined from mixed effects regression. Based on correlations for these variables, effect sizes are likely small.

^bGlobal measures were anchored on participant's general experiences.

^cPatient-specific measures were completed after genetic counseling appointments, with responses anchored on that specific patient interaction.

* $p < 0.05$ and ** $p < 0.001$.

was not significant in the model, stress and depression are presumably the driving factors. It may be that stress and depression account for so much of the explained variance in burnout because the impact of other contributors on burnout occurs through stress and/or depression. However, it is notable that most GCs who had PFI scores consistent with burnout were not depressed or experiencing a high level of stress. This suggests that while stress and depression account for a lot of the explained variance, multiple other variables play a role. This is consistent with the multifactorial nature of burnout, which has been observed in the broader clinician burnout literature (National Academy of Medicine, 2019). Like many social phenomena, burnout arises from a combination of many different factors. In our data, that is evident in how many different contributor variables were associated with burnout, as well as the small effect sizes for each variable. Also, since our model explains 42% of the variance in burnout, much of the variance is presumably explained by additional variables, further underscoring the multifactorial nature.

The direction (positive or negative) of the associations between most contributor variables and burnout was as would be expected. For example, prior work has found that higher levels of mindfulness

are associated with lower burnout scores and that is what we observed (Silver et al., 2019). One exception is the life balance subscale of the professional self-care scale. In the multivariate model, higher burnout scores were associated with higher life balance scores. Most of the items on this subscale refer to spending time with people outside of work; therefore, higher scores may be indicative of burnt-out GCs seeking out more social support or shifting their focus away from work and toward personal life, in response to their experience of burnout.

Several contributor variables were significant in bivariate analyses but not in multivariate analyses (ex. autonomy and feeling valued). In considering these variables, it is worth keeping in mind that linear regression assesses whether a variable has a relationship with burnout that is independent of the relationships between other variables in the model and burnout. All of the variables that were significant in bivariate analyses may contribute to burnout and may be appropriate for both further study and as targets for burnout-reducing interventions, even if their relationship with burnout has some overlap with the relationships of other contributors and burnout.

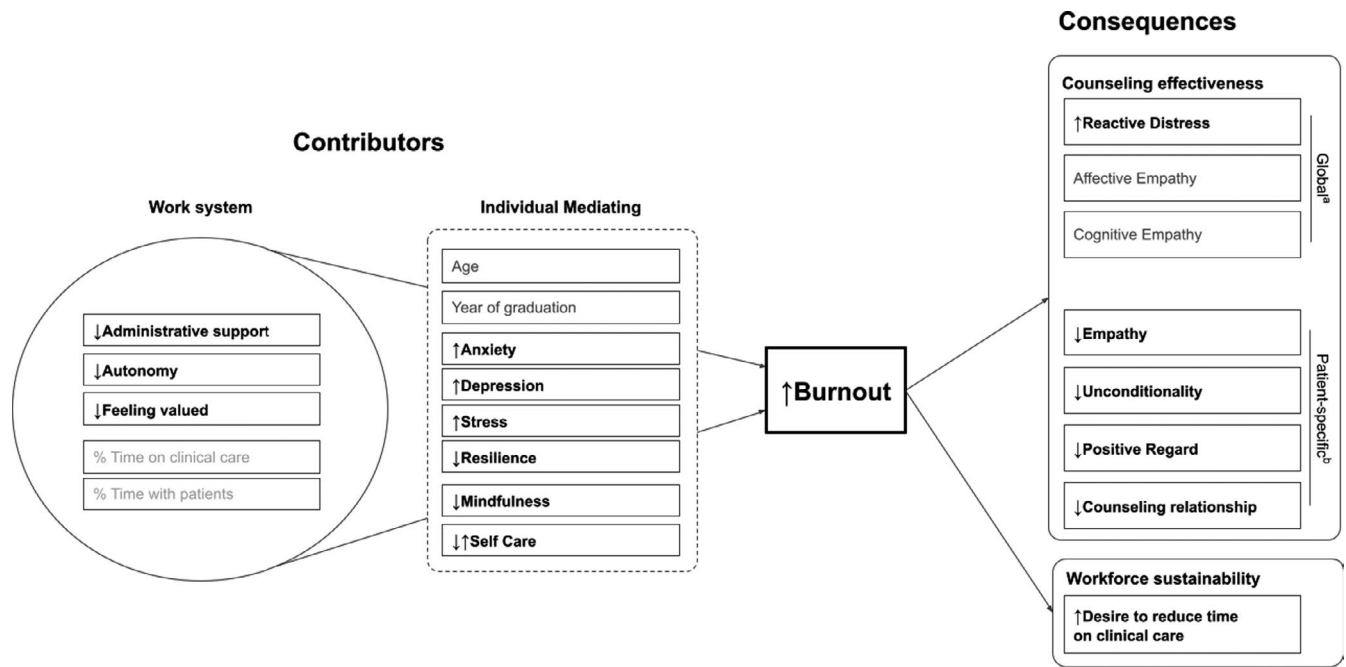


FIGURE 2 Conceptual model of findings. Model depicting our findings, informed by the systems model of clinician burnout proposed by the National Academy of Medicine (Figure 1) (National Academy of Medicine, 2019). Burnout arises through a combination of work system factors and individual mediating factors, and then leads to consequences. Variables associated with burnout in our dataset are displayed in black, and those not associated with burnout are displayed in gray. Effect sizes for all variables were small. ^aGlobal measures were not anchored on specific patient interactions and instead referred to general experiences. ^bPatient-specific measures were anchored on interactions with a specific patient the participant counseled as part of their regular work duties

4.2 | Consequences

The associations between consequence variables and burnout that we observed mirror prior studies on burnout in other clinicians (National Academy of Medicine, 2019; Niconchuk & Hyman, 2020). They also underscore the importance of taking action to reduce GC burnout, for the benefit of not only GCs, but also patients and the healthcare system. Interpreting these findings in light of the broader literature on clinician burnout and on patient-provider relationships, it is likely that burnout leads to reduced empathy and unconditional positive regard, which in turn leads to a weaker counseling alliance and, ultimately, worse patient outcomes. While we did not measure patient outcomes, a robust literature has demonstrated that empathy and the patient-provider relationship are critical to a wide range of both medical and psychosocial outcomes (Hall et al., 2010). The higher levels of reactive distress we observed in association with burnout may also impede counseling; the GC's own distress in response to the patient's experiences can interfere with the GC's ability to be present, empathic, and patient-centered.

As demand for GC services increases, the field has worked to grow the workforce. The association between burnout and a desire to reduce time spent on clinical care indicates that prevention of burnout may be a valuable strategy in minimizing attrition from clinical roles. The relationship between burnout and clinician attrition has been demonstrated in multiple studies and is also evident in the repeated finding in the NSGC Professional Status Survey that burnout is the number one reason GCs consider leaving the field

(National Academy of Medicine, 2019; National Society of Genetic Counselors, 2020; Niconchuk & Hyman, 2020).

It is important to note that while we have grouped variables as contributors and consequences following the NAM model (Figure 1), the cross-sectional and observational nature of our study does not allow us to infer either temporal order or causality. Furthermore, for several of the variables studied, both temporal order and direction of relationship with burnout remain unclear in the broader literature. For example, how depression and burnout relate to one another remains unresolved. Is depression a contributor, a consequence, or a co-occurring outcome? It is unclear whether burnout causes depression or vice versa or whether instead common susceptibility factors lead to the development of both depression and burnout.

4.3 | Practical implications

Our findings on consequences demonstrate the need to address GC burnout, and our data on contributors suggest multiple possible intervention points.

At the individual level, GCs can pursue mindfulness training, which is offered by many employers, including hospitals. GCs can also engage in the sorts of professional self-care activities that were associated with lower levels of burnout in our dataset, such as participating in professional activities that promote professional development, taking part in work-related community events, and connecting

with professional organizations. GCs who find themselves in roles with work system factors that put them at risk of burnout (e.g., lack of administrative support and autonomy) may benefit from either advocating for changes to those factors or from changing to a work setting with better work system factors.

At the work system level, employers hoping to minimize GC burnout can support GCs pursuing professional engagement and mindfulness practice. Employers may also be able to prevent burnout by providing adequate administrative support, giving GCs autonomy, and fostering a culture in which GCs feel valued. It is notable that most work system factors had quite large standard deviations, suggesting there is a lot of room for some employers to make improvements.

4.4 | Future research

While our data suggest the steps discussed above may be beneficial, intervention studies are needed to evaluate whether such approaches do indeed reduce burnout. Our randomized controlled trial of meditation for genetic counselors (Me-GC, the parent study) aims to provide that sort of evidence. Additional research is also needed to further delineate the origins of GC burnout, which can in turn inform interventions. There are many contributors that have been identified in studies on other clinicians that may be relevant for GCs but have not yet been investigated in our field, including, but not limited to, inadequate staffing, administrative burden, inadequate technology usability, moral distress, coping strategies, personal relationships, and support strategies (National Academy of Medicine, 2019). The external environment ring of the healthcare system (Figure 1) is not well represented in our dataset and warrants further investigation in the GC field. In addition, the origins and experiences of burnout among GCs from marginalized groups should specifically be investigated. A recent narrative review of the physician literature on burnout found a dearth of studies on burnout in physicians from marginalized groups (Silver et al., 2019). Non-white and male GCs were under-represented in our sample, and we did not have sufficient variance on either race or gender to investigate any differences in burnout there. Additional work is also needed on burnout in GCs who work in roles that do not involve counseling patients. Finally, the high prevalence of anxiety in our sample is notable and warrants further investigation and attention.

4.5 | Limitations

Ascertainment bias may have impacted our results since participants were recruited for a study on burnout that provided an intervention expected to help with burnout. Since we were limited to the variables available in the parent study, this is an incomplete exploration of possible contributors and consequences. Due to the cross-sectional nature of the study, we cannot assess temporal order or directionality of the relationships observed. Using GCs' report of strength of the counseling alliance, empathy for the

patient, and unconditional positive regard for the patient instead of patient report has notable limitations. Research on these variables has shown that patient ratings are more predictive of outcomes and thus are likely a more valuable metric than counselor ratings.

5 | CONCLUSION

Burnout is prevalent among GCs and likely has negative consequences for patient care and for retention of GCs in the clinical workforce. Our data are consistent with burnout arising in a multifactorial fashion, from a combination of individual and work system factors. They point toward multiple avenues that individuals and employers can pursue to mitigate burnout risk in GCs. Further research is needed to determine the efficacy of any measures aimed at reducing burnout.

AUTHOR CONTRIBUTIONS

CC confirms that she had full access to all data and takes responsibility for the integrity of the data and accuracy of the analyses. All authors contributed to the conception of the work and interpretation of the data. CC contributed to acquisition of the data. CC and HK conducted analyses. All authors gave final approval of this version to be published and agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of the work are appropriately investigated and resolved.

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COMPLIANCE WITH ETHICAL STANDARDS

CONFLICT OF INTEREST

All authors declare that they have no conflict of interest.

HUMAN STUDIES AND INFORMED CONSENT

This study was approved by the Stanford IRB via expedited review, with a waiver of documentation of informed consent. It was conducted in line with applicable international, national, and institutional guidelines.

ANIMAL STUDIES

No non-human animal studies were carried out by the authors for this article.

DATA SHARING AND DATA ACCESSIBILITY

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.

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