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9 Multidimensional Perfectionism is Related to Burnout in Surgeons

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51 **Abstract**

52 Accounts of work-related pressure by surgeons suggest a link between burnout – an
53 unhealthy occupational phenomenon – and perfectionism – the perceived or actual need to be
54 perfect. Adopting a stress-based theoretical framework, the present study assesses the degree
55 to which different dimensions of perfectionism are related to surgeon burnout. Using a cross-
56 sectional design, 298 registered surgeons in the UK completed an online survey that included
57 the brief Multidimensional Perfectionism Scale (Cox et al., 2002) and the Maslach Burnout
58 Inventory (Maslach et al., 2016). Analyses showed that, when surgeons expected themselves
59 to be perfect, they reported higher exhaustion and, when they reported that others expected
60 them to be perfect, they reported higher levels of all three elements of burnout. Perceptions
61 that others expected them to be perfect was the most important predictor of each element of
62 burnout. Reducing these perceptions via targeted intervention, improved training, and
63 workplace changes may help prevent surgeon burnout.

64

65 *Keywords:* wellbeing, motivation, performance

66 **Introduction**

67 Burnout is described by the World Health Organization (2025) in the International
68 Classification of Diseases (ICD-11) as an occupational phenomenon related to chronic work-
69 based stress. It has three core elements: emotional exhaustion, depersonalization and (low)
70 personal accomplishment (Maslach and Jackson, 1981). While it is not formally recognized
71 as a medical condition, it is related to a range of mental health and performance related
72 problems which make it an important issue in a work context. This is especially the case in
73 medical professions and for surgeons, in particular, for whom work demands are typically
74 high and who routinely undertake life-changing and life-saving work. Accounts of surgeons
75 reinforce the notion that burnout is a significant but underrecognized issue in the profession
76 with recent work highlighting its importance to surgeons and patients alike (e.g., Al-Ghunaim
77 et al., 2022a).

78 As reflected in its definition and description, the prevailing view of burnout is that it
79 is the result of prolonged stress, occurring when emotional and situational demands exceed
80 available resources over an extended period of time (Maslach et al., 2001). This explanation
81 has been expanded in formal models to take into account job demands, job resources, and
82 personal resources (Bakker and Demerouti, 2007). Other more social-based models also exist
83 and have emphasized interpersonal relationships at work such as perceptions of effectiveness
84 and supportiveness from others (Harrison, 1983), as well as reciprocity of relationships in the
85 workplace (Schaufeli et al., 1996). However, overall, rather than offering alternative
86 explanations for burnout, these models can also be understood within a broader stress-based
87 perspective in which features of the work environment contribute to the overall balance
88 between demands and resources.

89 The prevalence of surgeon burnout is difficult to estimate. This is because there are
90 multiple instruments used to measure burnout and the thresholds for identifying levels of

91 burnout, when available, vary. However, by way of example, using the most common
92 measure of burnout (the Maslach Burnout Inventory; Maslach and Jackson, 1981), one recent
93 meta-analysis estimated that nearly a third of surgeons may exhibit high levels of at least one
94 of its symptoms (Bartholomew et al., 2018). Estimates of the number of surgeons exhibiting
95 high levels of all three symptoms was much lower at approximately 3%. However, of note, in
96 absolute terms, this represents a significant number of practicing surgeons. In addition, these
97 estimates are reasonably consistent with the prevalence of formally recognized mental health
98 conditions (Kelloway et al., 2023).

99 Along with its prevalence, there are other reasons to be concerned about surgeon
100 burnout. Namely, burnout is harmful to surgeons and their patients. In regard to surgeons, for
101 instance, there is evidence that burnout is related to higher conflict at home (Dyrbye et al.,
102 2011), depressive symptoms (Faivre et al., 2018), and thoughts of suicide (Shanafelt et al.,
103 2011). In regard to patients, a recent review and meta-analysis on the topic showed that
104 surgeon burnout is related to worse patient safety and patient care in the form of increased
105 likelihood of medical errors and lower professionalism (Al-Ghunaim et al., 2022b). As such,
106 burnout can have a profound and negative effect on many aspects of a surgeons personal and
107 professional life.

108 In order to better support surgeons with these issues, research has identified a range of
109 demographic, work-related, and personality factors related to surgeon burnout (see Galaiya et
110 al., 2020). Surgeons who score higher on burnout tend to be younger, female, and single, for
111 example. They also tend to work longer hours and nights, have poorer relationships at work,
112 and lack mentorship opportunities. From a personality perspective, they also tend to be more
113 neurotic, less extraverted, agreeable, conscientious, and less resilient and mindful. Some of
114 these factors are modifiable and point to the need for better support during formative training
115 and more manageable and positive work environments. However, paradoxically, some of the

116 risk factors appear to be attributable to recruitment and training practices within the
117 profession, and the attitudes and values surgeons are encouraged to adopt to succeed (Cope et
118 al., 2017).

119 **Multidimensional Perfectionism**

120 In keeping with this idea are the accounts of surgeons that suggest their proneness to
121 burnout may partly reflect the tendency to be perfectionistic in their work (Al-Ghunaim et al.,
122 2022; Robinson et al., 2021). Perfectionism has been defined as the perceived or actual
123 requirement to be perfect (Hewitt and Flett, 2004). It is a complex and easily misunderstood
124 personality trait. As perfectionism can underpin effort, commitment, and dedication, it might
125 reasonably be seen as something desirable or even necessary in a profession such as surgery.
126 It is a profession where both the stakes and threat of personal litigation can be extremely high
127 so the goal of performing perfectly is alluring (Ahuja, 2024). However, perfectionism is also
128 a major source of stress and mental health problems. As such, when the various ways
129 perfectionism can be helpful or harmful are weighed against each other, it is typically
130 regarded as something that needs to be reduced rather than encouraged (Hill et al., 2025a).

131 One influential approach to studying perfectionism is to distinguish between whether
132 perfectionistic demands are imposed on the self (self-oriented perfectionism), imposed on
133 other people (other-oriented perfectionism), or perceived to be imposed by others (socially
134 prescribed perfectionism; Hewitt and Flett, 1991). This distinction is very important when
135 seeking to understand the effects of perfectionism as they can differ. Research has shown that
136 self-oriented perfectionism is typically related to an ambiguous mix of motivation,
137 performance, and mental health issues, and is particularly problematic under conditions of
138 stress (e.g., Besser et al., 2008). By contrast, other-oriented perfectionism is typically
139 unrelated to personal problems but is related to social difficulties and trouble maintaining
140 positive relationships with others (e.g., Stoeber 2014). Finally, socially prescribed

141 perfectionism, with its neurotic and oppressive undertones, is the unhealthiest of the three
142 and is typically related to severe mental health issues (e.g., Smith et al., 2018)

143 The differences between the three dimensions extend to burnout, generally, with
144 socially prescribed perfectionism typically being the strongest predictor and the role of the
145 other two dimensions more uncertain (Hill and Curran, 2016). In the case of self-oriented
146 perfectionism, the relationship is sometimes even negative, especially when statistically
147 controlling for the other two dimensions (e.g., Childs and Stoeber, 2010). The relationship
148 between these three dimensions of perfectionism and surgeon burnout has yet to be examined.
149 However, two qualitative studies exploring the experiences of burnout among current and
150 training surgeons have noted that perfectionism tends to be high among those who choose
151 surgery as a specialism and is an ongoing source of disappointment among surgeons in their
152 careers (Al-Ghunaim et al., 2022a; Robinson et al., 2021). In addition, one recent study found
153 that other forms of perfectionism are related to higher burnout in surgeons (Malempati et al.,
154 2025). With these studies in mind, along with possible implications for intervention, training,
155 and organisational change, we sought to provide a first test of the relationship between the
156 three aforementioned dimensions of perfectionism and surgeon burnout.

157 **The Present Study**

158 The aim of the present study was to examine whether perfectionism predicts burnout
159 in surgeons and, in doing so, seek to identify to what degree each of the three dimensions of
160 perfectionism may be risk factors for burnout in surgeons. Based on existing research in this
161 area, we hypothesised that (H1) self-oriented perfectionism would negatively predict all
162 burnout symptoms, (H2) socially prescribed perfectionism would positively predict all
163 burnout symptoms, and (H3) other oriented perfectionism would be unrelated to all burnout
164 symptoms.

165 **Method**

166 **Participants and Procedure**

167 Following our preliminary analysis (see section below), participants were 298 GMC
168 registered surgeons. Their mean age was 48.31 (SD = 10.23, 27 to 67 years old) and they
169 were typically male (196 males, 100 females, 2 preferred not to say). The ethnicity of the
170 surgeons was typically white-British (180) and Asian or Asian British – Indian (38), with a
171 smaller number of other ethnicities also represented (e.g., Asian or Asian British – Pakistani
172 [9], - Bangladeshi [5]). The surgeons were typically married (226) or in a relationship (39)
173 with a smaller number single (15), divorced (9), separated (5) or reporting another status (4,
174 engaged, widowed, or preferred not to say). The surgeons reported being qualified doctors
175 for 24.07 years (SD = 10.44). The most common types of specialities were orthopaedic
176 surgeon (65), general surgeon (37) colorectal (30), ENT (29) and urologist (22) with most
177 being consultants (217) and the rest evenly split across other grades (CTI2/STI-2 = 13, SR3/4
178 = 16, STI5/6 = 14, ST7/8, post-CCT fellow = 15, non-consultant career grade doctor = 23).

179 Surgeons were recruited via personal networks, scholarly societies and private
180 hospitals via advertisement and direct contact. All surgeons were required to be registered
181 with the General Medical Council to take part in the study. We had a minimum target sample
182 size of 109 surgeons based on an a priori power analysis. The power analysis was based on
183 the effects observed in previous research examining the predictive ability of the three
184 dimensions of perfectionism for burnout in other professions (Childs and Stoeber, 2010).
185 Details of the power analysis are available in the preregistration document for the study (Hill
186 et al., 2024). The final sample exceeded the target sample size as a consequence of a longer
187 recruitment period and a larger than expected response rate. The larger sample permits
188 greater precision in estimate of effects and additional analyses (identified below).

189 The study was granted ethical approval by the university of the first author
190 (ETH2324-0202). We also confirmed that Health Research Authority approval was not
191 required with our local NHS Trust. The hypotheses, analyses, and procedures were pre-
192 registered (Hill et al., 2024). The preregistered protocol was followed with three exceptions:

193 (1) we excluded surgeons who responded to the questionnaire and were older than the
194 pensionable age in the UK (>67 years old) as we considered it less reasonable to assess
195 burnout in this group (n = 32) and the larger sample size allowed us to both (2) undertake
196 additional tests of the psychometric properties of the instruments (Supplementary Materials,
197 Table S1 and Table S2), and (3) undertake exploratory analyses that included controlling for
198 age and sex which are two factors previously found to be related to surgeon burnout (Galaiya
199 et al., 2020; Supplementary Materials, Table S3).

200 **Data Availability Statement**

201 Anonymised data for the study is publicly available along with code to reproduce the
202 findings (Hill, Madigan, et al., 2025).

203 **Measures**

204 **Perfectionism.** Perfectionism was measured using the brief version of the
205 Multidimensional Perfectionism Scale (HF-MPS; Hewitt and Flett, 1991) developed by Cox
206 et al (2002). This version is a frequently used scale with the notable advantage of reduced
207 participant burden due to shorter length and faster completion time. The brief HF-MPS
208 contains five items to assess self-oriented perfectionism (e.g., “I am perfectionistic in setting
209 my goals”), five items to assess socially prescribed perfectionism (e.g., “I feel that people are
210 too demanding of me”), and five items to assess other-oriented perfectionism (e.g., “I do not
211 have very high standards for those around me” [reversed]) with responses given on a seven-
212 point Likert scale (1 = *strongly disagree* to 7 = *strongly agree*). Evidence to support the
213 validity and reliability of scores when using the brief version has been provided by Cox et al.
214 (2002) including evidence of better psychometric properties than the longer scale (e.g., factor
215 structure).

216 **Burnout.** Burnout was measured using the Maslach Burnout Inventory¹ – Human
217 Services Survey for Medical Personnel (MBI-HSS, Maslach et al., 2016) was used to burnout
218 symptoms. The MBI and its different versions are the most used widely scales to measure
219 burnout. It includes nine items to measure exhaustion (e.g., “I feel emotionally drained from
220 my work”), five items to measure depersonalisation (e.g., “I don’t really care what happens
221 to some patients”), and eight items to measure professional accomplishment (e.g., “I have
222 accomplished many worthwhile things in this job”). Responses were recorded on a 7-point
223 scale measuring frequency with which the burnout symptom is experienced (0 = “Never” to 7
224 = “Every day”). Scores of exhaustion > 27, depersonalisation > 13, and personal
225 accomplishment < 31 are considered to indicative of high burnout (Maslach et al., 2016).
226 Evidence of the validity and reliability of the scores of the instrument is provided by Maslach
227 et al. (2016).

228 **Statistical Analyses**

229 Three OLS multiple regressions with dimensions of perfectionism as predictors and
230 burnout symptoms as criterion variables were used to test H1 to H3. Bias corrected-
231 accelerated bootstrap estimates of standard errors and 95% confidence intervals (CI) were
232 also used to provide robust estimates (using 1000 random resamples and arbitrary seed
233 [1234] for reproducibility). Variance explained in each model (R^2 and adjusted R^2) along
234 with unstandardized (B) and unstandardized (β) regression coefficients served as effect sizes.
235 Cohen’s (1992) recommendations for standardized effect sizes (r ; .10, .30, and .50) and
236 model variance (R^2 ; small = .20, medium = .13, and large = .26) were used to aid
237 interpretation. Statistical significance was set at a conventional level ($p < .05$, two-tailed).
238 IBM SPSS (version 28.0; IBM Corp, 2021) was used for screening data, descriptive statistics,

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239 correlations, and OLS multiple regression analyses. Mplus (version 8.1; Muthén and Muthén,
240 2020) was used to evaluate factor structures of the scales used.

241 **Results**

242 **Preliminary Analyses**

243 No participant data was included unless they had fully consented to the conditions of
244 the project, completed the questionnaire form beyond just the consent form, and stated they
245 were registered with the General Medical Council. Data were screened for errors and missing
246 values (see Tabachnick and Fidell, 2013, for details of this procedure). There were 45 cases
247 with missing data of which 37 cases had missing data above 5% and were therefore removed.
248 Of note, of the 37 cases 15 did not complete both perfectionism and burnout instruments and
249 17 did not complete the burnout instrument (the other five cases had missed items across
250 instruments)². Frequency of missing data for the retained cases was minimal (8 cases with 1
251 missing time each). Missing values for these cases were replaced with the mean of the
252 available items from the relevant subscale for that individual (Graham et al., 2003).

253 After computing scale scores, two univariate outliers (zscore > +/-3.29) and one
254 multivariate outlier were removed (Mahalanobis distance, $\chi^2 [6] = 22.46, p < .001$).
255 Thereafter, most of the variables continued to deviate from a normal distribution. However,
256 having removed both univariate and multivariate outliers, and intending to use bias corrected
257 bootstrapping in the primary analysis (a technique that does not assume normality and
258 addresses asymmetry in distributions of scores), we continued with the analyses.

²In inspecting missing data, we noted the following: (1) Little's Missing Completely at Random (MCAR) test suggested that the data were not missing completely at random, $\chi^2 (418) = 484.33, p = .014$. (2) Comparison of surgeons with missing data with those with complete data revealed no significant differences on measured items (all $p > .05$), suggesting that missingness was not systematically related to observed variables (i.e., data may be missing at random, MAR). In other words, those missing perfectionism scores did not have significantly higher burnout and those missing burnout scores did not have significantly higher perfectionism. (3) For surgeons who did not complete the burnout instrument, it is possible that the non-completion of the instrument was due to their unobserved/missing level of burnout (i.e., missing-not-at-random, MNAR). However, this possibility cannot be empirically tested with our data so cannot be confirmed or ruled out. The implications are discussed in the limitations section.

259 The final sample size ($N = 298$) permitted a more detailed examination of the
260 structure of the scales. Factor structures were assessed using Confirmatory Factor Analysis
261 (CFA) and Exploratory Structural Equation Modelling (ESEM) both with Robust Maximum
262 Likelihood estimation and using target rotation for ESEM. We used ESEM as well as CFA as
263 ESEM permits cross-loadings of items (whereas in CFA they are all set to zero) and can
264 therefore be more appropriate when assessing multidimensional instruments (Marsh et al.,
265 2009). Conventional criteria were used as indicative of reasonable fit: χ^2 (df) $p > .05$, CFI and
266 TLI $> .90$, RMSEA $< .08$, 90% CI $< .05$ to $< .08$; SRMR $< .08$, AIC and BIC (smaller
267 indicates better fit in model comparison) (Marsh et al., 2004). With factor loading considered
268 meaningful $\geq .32$ (Worthington and Whittaker, 2006). All results are reported in full in the
269 supplementary materials (Table S1 and S2).

270 The brief HF-MPS provided fit marginally below criteria for reasonable fit: CFA - χ^2
271 (87) = 285.77, $p < .001$, CFI = .87, TLI = .85, SRMR = .07, RMSEA = .09 (90% CI .08, .10),
272 AIC = 14934.79, BIC = 15112.25. All items loaded meaningful on subscales. Allowing item
273 cross-loading to be non-zero (a less stringent but more reasonable test) in the ESEM provided
274 a better fit that exceeded criteria for reasonable fit: ESEM - χ^2 (63) = 151.88, $p < .001$, CFI =
275 .94, TLI = .91, SRMR = .03, RMSEA = .07 (90% CI .06, .08), AIC = 14832.56, BIC =
276 15098.75. Meaningful cross-loadings were minimal (1 of 30 instances) and included below
277 meaningful loading on target factor (an item for SOP). Overall, the reasonable fit of the brief
278 HF-MPS was confirmed by these analyses.

279 Undertaking the same analysis for the MBI-HSS provided similar results. CFA
280 provided fit marginally below criteria for reasonable fit: χ^2 (206) = 614.89, $p < .001$, CFI =
281 .85, TLI = .83, SRMR = .08, RMSEA = .08 (90% CI .07, .09), AIC = 21985.56, BIC =
282 22240.66. All items loaded meaningful on subscales. ESEM provided better fit that, overall,
283 exceeded criteria for reasonable: χ^2 (168) = 421.54, $p < .001$, CFI = .91, TLI = .87, SRMR =

284 .04, RMSEA = .07 (90% CI .06, .08), AIC = 21832.06, BIC = 22227.32. Meaningful cross-
285 loadings were minimal (2 of 44 instances) and no instances of items not loading on target
286 factors meaningfully. Again, overall, the reasonable fit of the MBI-HSS was confirmed by
287 these analyses.

288 Internal consistencies of the subscale scores were checked using Cronbach's alpha
289 and MacDonald's omega (Table 1). All subscale scores displayed adequate internal
290 consistencies (α and $\Omega \geq .70$).

291 **Descriptive Statistics and Bivariate Correlations**

292 Descriptive statistics and bivariate correlations are reported in Table 1. Based on the
293 response format, participants reported high self-oriented perfectionism scores, moderate
294 socially prescribed perfectionism scores, and low other oriented perfectionism scores. These
295 scores are notably higher than observed in student samples (see Curran and Hill, 2019).
296 Typical levels of reported burnout symptoms were indicative of experiencing exhaustion
297 "once a week", depersonalisation in the "once a month or less," and professional
298 accomplishment "a few times a week". When using cut-offs for the MBI associated with high
299 burnout, 66.78% of the surgeons report high exhaustion, 36.24% of the surgeons reported
300 high depersonalisation, and 4.03% reported low levels of personal accomplishment. Across
301 all symptoms, 2.68% of surgeons reported high levels of burnout.

302 Based on the bivariate correlations, self-oriented perfectionism displayed a small-to-
303 medium, positive, and statistically significant relationship with exhaustion and small, non-
304 statistically significant relationships with depersonalisation and professional
305 accomplishment. Socially prescribed perfectionism displayed a large, positive, and
306 statistically significant relationship with exhaustion, a medium, positive, statistically
307 significant relationship with depersonalisation, and a small, negative, statistically significant
308 relationship with personal accomplishment. Other oriented perfectionism displayed small,
309 and non-statistically significant relationships with all three burnout symptoms.

310 **Multiple Regressions**

311 *Exhaustion.* Perfectionism explained a large and significant amount of variance in
312 exhaustion: $F(3, 294) = 34.91, p < .001, R^2 = .26, \text{adjusted } R^2 = .26$. Socially prescribed
313 perfectionism was the only statistically significant unique predictor and was positively
314 related to exhaustion ($\beta = .55, p < .001$). Self-oriented perfectionism ($\beta = -.09, p = .237$) and
315 other oriented perfectionism ($\beta = .00, p = .951$) were not statistically significant unique
316 predictors of exhaustion.

317 *Depersonalization.* Perfectionism explained a medium and significant amount of
318 variance in depersonalization: $F(3, 294) = 16.29, p < .001, R^2 = .14, \text{adjusted } R^2 = .13$.
319 Socially prescribed perfectionism was a statistically significant unique predictor and was
320 positively related to depersonalization ($\beta = .43, p < .001$). Self-oriented perfectionism was a
321 statistically significant unique predictor and was negatively related to depersonalization ($\beta =$
322 $-.15, p = .028$). Other oriented perfectionism ($\beta = -.09, p = .109$) was not a statistically
323 significant unique predictor of depersonalization.

324 *Personal Accomplishment.* Perfectionism explained a small-to-medium and
325 significant amount of variance in personal accomplishment: $F(3, 294) = 7.61, p < .001, R^2 =$
326 $.07, \text{adjusted } R^2 = .06$. Socially prescribed perfectionism was a statistically significant unique
327 predictor and was negatively related to personal accomplishment ($\beta = -.30, p < .001$). Self-
328 oriented perfectionism was a statistically significant unique predictor and was positively
329 related to personal accomplishment ($\beta = .25, p < .001$). Other oriented perfectionism ($\beta = -.09,$
330 $p = .120$) was not a statistically significant unique predictor of personal accomplishment.

331 *Exploratory analyses.* Non-preregistered analyses were conducted to re-examine the
332 three aforementioned models controlling for gender and age. There was no substantive
333 difference in the findings with dimensions of perfectionism remaining statistically significant
334 predictors of burnout symptoms. The results are reported in the Supplementary Materials
335 (Table S2).

336

Discussion

337 The aim of the present study was to examine the degree to which perfectionism
338 predicts burnout in surgeons. It was hypothesized that (H1) self-oriented perfectionism would
339 negatively predict all burnout symptoms; (H2) socially prescribed perfectionism would
340 positively predict all burnout symptoms; and (H3) other oriented perfectionism will be
341 unrelated to all burnout symptoms. We found mixed support for H1 - self-oriented
342 perfectionism negatively predicted two burnout symptoms (depersonalization and
343 professional accomplishment) and did not predict the other burnout symptom (exhaustion).
344 However, H2 and H3 were fully supported.

345 **Perfectionism and burnout**

346 Our findings indicate that some, but not all, dimensions of perfectionism are related to
347 surgeon burnout. Distinguishing between the source of perfectionistic demands matters. The
348 main predictor of burnout symptoms was socially prescribed perfectionism. This is a
349 dimension characterised by perceptions of external pressure and criticism from others. Note,
350 in this form, these perceptions may or may not reflect the existence of specific sources of
351 external pressure (Smith et al., 2017). Rather, largely via experience, individuals high in this
352 dimension have learned and then internalised beliefs about the unrealistic expectations of
353 others (Hewitt et al., 2017). In this regard, it is a firm feature and characteristic of the
354 individual. However, in context of the exceptionally high standards expected from surgeons,
355 experienced during education, training, and in the workplace, along with the wider culture
356 within medical professions, these perceptions may well be strongly linked to tangible,
357 observable, and ongoing features of their environment.

358 On this possibility we note that concerns about the unrealistic expectations associated
359 with surgeon training and surgical practice are common. Indeed, “perfection as a minimum
360 standard” is a reoccurring theme in reflective accounts of the surgical profession and
361 medicine more widely (e.g., Arianna, 2017; Pfifferling, 2008; Yanes. 2017). These accounts
362 are instructive in two ways. First, the accounts highlight the possible roots of socially
363 prescribed perfectionism among surgeons in a culture that equates mistakes and imperfection

364 with incompetence, rather than something that is inevitable in a complex and difficult job.
365 Second, the accounts also illustrate how the pursuit of perfection in medicine is regarded as
366 an ethical and moral imperative. That is, unlike many other professions where burnout might
367 arise, in surgery acceptance of anything less than perfection, regardless of how reasonable, is
368 construed as a flaw in a surgeon's professionalism and character. The degree to which this
369 culture alone is responsible for surgeon burnout versus perfectionism in trait form is an
370 interesting question for future research.

371 Self-oriented perfectionism was more ambiguous than socially prescribed
372 perfectionism. At a bivariate level, it was positively correlated to exhaustion and unrelated to
373 the other two symptoms. However, after controlling for the other two dimensions of
374 perfectionism, it did not predict exhaustion, negatively predicted depersonalisation, and
375 positively predicted personal accomplishment. These findings are indicative of statistical
376 suppression and require careful consideration (see Hill, 2014; Stoeber and Gaudreau, 2017).
377 As dimensions of perfectionism are positively related, parsing their relationships with other
378 variables like burnout can sometimes provide these types of effects. Rather than indicating
379 that self-oriented perfectionism might be beneficial in regards to burnout, these findings
380 signal that the source of its relationship with burnout is its overlap with other dimensions of
381 perfectionism, socially prescribed perfectionism, in particular. As such, although
382 nonintuitive, our understanding of these types of effects, and more general findings that link
383 self-oriented perfectionism to mental health issues, provide a firm basis to warn surgeons of
384 the dangers of placing unrealistic and irrational demands on themselves (Hill, Kim et al.,
385 2025).

386 Expecting others to be perfect was not related to surgeon burnout. This is consistent
387 with research more widely that has shown this dimension of perfectionism to be largely
388 unrelated to personal outcomes. Reflecting its strong interpersonal focus, instead, it is
389 typically influential in relationships with others. Callousness and competitiveness, along with

390 narcissism and dominance, are among the outcomes found to be related to other-oriented
391 perfectionism, for example (Stoeber, 2014, 2015). With this in mind, it remains possible that
392 this dimension of perfectionism may be indirectly related to burnout by increasing stressful
393 relationships with others, poorer teamwork, less collegial relationships, and generally
394 diminishing the quality of support that can be helpful in reducing stress. It is also possible
395 that while this dimension does not predict personal burnout, it predicts burnout in work
396 colleagues either directly or indirectly via, for example, rude, dismissive, and aggressive
397 communication which has been found to be evident among some surgeons (Bradley et al.,
398 2015). These possibilities are worthy of examination in future studies. In the meantime, the
399 present findings suggest that this dimension of perfectionism may be less relevant to surgeon
400 burnout than other dimensions despite its other undesirable effects.

401 As concerns regarding surgeon burnout continue to grow and more concerted efforts
402 are made to intervene, the present study suggests that surgeon perfectionism is an important
403 consideration. Perfectionism appears to be common in surgeons – the mean scores in our
404 sample support this suggestion and were notably higher than in more general samples for all
405 three dimensions (e.g., Curran and Hill, 2019). We can therefore expect many of the mental
406 health issues associated with perfectionism to be especially prevalent in surgeons (see Hill,
407 Kim et al., 2025). Indeed, initial work suggests as much with emerging links between
408 perfectionism and issues closely related to burnout such as depression beginning to appear in
409 research on surgeons (e.g., Malempati et al., 2025). However, overall, the trait is surprisingly
410 understudied in this group given the ways striving for perfection and an intolerance of
411 imperfection appear to feature so heavily in the culture of the profession. In this regard, we
412 hope the present study provides impetus for further research and a better understanding of the
413 relationship between perfectionism, burnout, and other important consequences in surgeons.

414 **Applied Implications**

415 Given the limitations of the design of the study, any applied implications are tentative
416 and subject to additional research. However, the findings of this research and research in
417 other medical professions (e.g., physicians; Martin et al., 2022) point to the benefits of
418 reducing perfectionism in surgeons. Importantly, this does not mean advocating for a lower
419 quality of performance or care. Rather, it entails reducing irrational and unhelpful ideals in
420 support of surgeon mental health and, in turn, better patient care. There are currently no
421 surgeon specific intervention studies focused on perfectionism. However, there is a
422 substantial body of research that indicates formal interventions are effective in reducing
423 perfectionism, generally, so provide a suitable starting point (e.g., Cognitive Behavioral
424 Therapy, Galloway et al., 2022). There is also evidence that increasing knowledge of
425 perfectionism may increase the likelihood of seeking support if needed so this approach
426 provides a second avenue of preventive support via integration into routine training (e.g.,
427 Etherson et al., 2025). Finally, given the roots of perfectionism and burnout partly lie in
428 workplace culture, supporting more positive work environments is also an important means
429 of addressing both, too. Again, in the absence of specific work of this kind, work examining
430 the effectiveness of organization interventions generally provides a starting point (e.g.,
431 workload reduction, peer support, and job crafting, Cohen et al., 2023) with other sources
432 available to guide adaptation of existing work to surgeons (e.g., Hirayama et al., 2016).

433 **Limitations and Future Directions**

434 The present study has a number of limitations. First, a cross-sectional design was
435 employed so no claims of causality can be made (the use of the term “predicts” and “predictor”
436 in the aims and analyses is not intended to imply causality). Longitudinal examination of these
437 relationships is needed to provide the next step towards such claims. Second, our approach to
438 sampling was non-random and non-stratified, so caution is required in regard to generalisability
439 of the findings. Based on respondents to the most recent UK surgical workforce census data,
440 our sample includes more consultants, specialised surgeons, and are slightly older than is

441 typical, but is broadly similar in regards to gender and ethnicity (Royal College of Surgeons,
442 2025). In addition, we might expect an under-representation of surgeons with higher levels of
443 burnout in the current study. This issue was alluded to in our examination of missing data
444 which raised the possibility that surgeons who did not complete the questionnaire fully could
445 have been those with higher burnout. Third, all instruments were self-report scales for which
446 socially desirability and common method variance can be problematic. The former issue may
447 be especially important for symptoms like depersonalization that require surgeons to provide
448 information on the care they provide patients. Some surgeons may be reluctant to divulge the
449 degree to which they are cynical towards patients or the degree to which they have detached
450 themselves from this aspect of their work due to the ethical issues this raises, for example. The
451 latter issue is important because common method variance can bias and inflate effect sizes
452 (MacKenzie and Podsakoff, 2012). Fourth, again related to measurement, we used two
453 particular instruments to measure perfectionism and burnout. Other instruments can vary in
454 regard to item content and dimensions so it should not be assumed that the findings apply to
455 other measures. They do, though, provide a strong basis from which to examine these relations
456 further.

457 **Conclusion**

458 The present study provides evidence of a link between multidimensional perfectionism
459 and surgeon burnout. Surgeons who perceived others expect them to be perfect reported
460 higher levels of burnout. Reducing this dimension of perfectionism through targeted
461 intervention, improved training, and workplace change may therefore be an important new
462 means of preventing surgeon burnout.

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Table 1. Descriptive Statistics, Bivariate Correlations, and Internal Reliabilities

	1	2	3	4	5	6
1. Self-oriented perfectionism						
2. Socially prescribed perfectionism	.60***					
3. Other-oriented perfectionism	-.09	.01				
4. Exhaustion	.26***	.51***	-.01			
5. Depersonalisation	.10	.34***	-.10	.63***		
6. Personal accomplishment	.07	-.15*	.11	-.39***	-.43***	
<i>M</i>	5.35	4.01	5.09	3.92	2.54	5.52
<i>SD</i>	1.14	1.33	1.02	1.42	1.16	0.88
α / Ω	.84 / .85	.82 / .83	.76 / .75	.93 / .93	.76 / .76	.77 / .77

Note. * $p < .05$, ** $p < .01$, *** $p < .001$, two-tailed.

Table 2. Results of Regression of Burnout Symptoms on Perfectionism in Surgeons

	B	SE	β	t	<i>p</i>	SE _{BCa}	<i>p</i> _{BCa}	B 95% CI _{BCa}
Criterion Variable: Exhaustion								
Self-oriented perfectionism	-0.09	0.08	-.08	-1.18	.237	0.08	.268	-0.26, 0.07
Socially prescribed perfectionism	0.59	0.07	.55	8.80	<.001	0.07	<.001	0.47, 0.72
Other-oriented perfectionism	0.00	0.07	.00	0.62	.951	0.07	.959	-0.13, 0.15
Criterion Variable: Depersonalization								
Self-oriented perfectionism	-0.15	0.07	-.15	-2.21	.028	0.07	.024	-0.30, -0.14
Socially prescribed perfectionism	0.38	0.06	.43	6.39	<.001	0.06	<.001	0.27, 0.47
Other-oriented perfectionism	-0.10	0.06	-.09	-1.61	.109	0.06	.101	-0.22, 0.03
Criterion Variable: Personal Accomplishment								
Self-oriented perfectionism	0.19	0.06	.25	3.46	<.001	0.06	.003	0.07, 0.31
Socially prescribed perfectionism	-0.20	0.05	-.30	-4.19	<.001	0.05	<.001	-0.29, -0.10
Other-oriented perfectionism	0.08	0.05	.09	1.56	.120	0.05	.152	-0.02, 0.17

Note. B – Unstandardized regression coefficient. SE = Standard error, β = standardized regression coefficient, t = t value, BCa = Bias corrected accelerated bootstrap estimates, CI = Confidence intervals (confidence intervals that exclude zero are statistically significant, $p < .05$). * $p < .05$, ** $p < .01$, *** $p < .001$, two-tailed.

Table S1. Standardised Factor Loadings from CFA and ESEM for the brief Multidimensional Perfectionism Scale.

	SOP	SPP	OOP	SOP	SPP	OOP
1	.82***			.85***	-.02	-.00
3	.78***			.85***	-.08	-.06
5	.86***			.87***	-.02	-.03
7	.61***			.49***	.15	.08
9	.59***			.27***	<u>.50***</u>	.08
2		.68***		.30***	.48***	.02
4		.56***		-.10	.64***	-.08
6		.68***		-.11*	.80***	-.11*
8		.68***		.09	.64***	.05
10		.85***		.18**	.72***	.06
11			.42***	.11	-.01	.41***
12			.70***	-.02	-.14*	.70***
13			.74***	-.02	-.08	.74***
14			.74***	-.04	.12*	.76***
15			.58***	-.04	.02	.58***

Note. *** $p < .001$, ** $p < .01$, * $p < .05$; two-tailed. Cross-loadings that exceed .32 are underlined.

Table S2. Standardised Factor Loadings from CFA and ESEM for the Maslach Burnout Inventory - Human Services Survey for Medical Personnel

	CFA			ESEM		
	EX	DP	PA	EX	DP	PA
1	.87***			.91***	-.05	.02
2	.84***			.87***	-.06	-.01
3	.85***			.85***	-.04	-.07
6	.66***			.49***	.31***	-.09
8	.91***			.89***	.04	.01
13	.66***			.58***	.13*	-.06
14	.66***			.62***	.06	-.03
16	.65***			.49***	.31***	-.07
20	.81***			.77***	.10	.01
5		.60**		.06	.65***	-.05
10		.81***		.23***	.52***	-.15*
11		.74***		<u>.40***</u>	.32***	-.15*
15		.54***		-.03	.69***	-.03
22		.44***		.31***	.33***	.09
4			.33***	.26***	-.23**	.33***
7			.49***	.01	-.15	.40***
9			.70***	-.01	.15	.79***
12			.51***	<u>-.43***</u>	.20**	.42***
17			.51***	.10	-.26*	.41***
18			.59***	.08	.00	.63***
19			.68***	-.00	.15	.79***
21			.54***	.09	-.12	.50***

Note. *** $p < .001$, ** $p < .01$, * $p < .05$; two-tailed. Cross-loadings that exceed .32 are underlined.

Table S3. Results of Regression of Burnout Symptoms on Perfectionism in Surgeons (controlling for age and gender)

	B	SE	β	t	<i>p</i>	SE _{BCa}	<i>p</i> _{BCa}	B 95% CI _{BCa}
Criterion Variable: Exhaustion								
Age	0.00	0.01	.03	0.54	.593	0.01	.610	-0.01, 0.02
Gender	0.24	0.15	.09	1.62	.107	0.14	.087	-0.04, 0.51
Self-oriented perfectionism	-0.09	0.08	-.07	-1.12	.263	0.08	.298	-0.25, 0.08
Socially prescribed perfectionism	0.58	0.07	.54	8.45	<.001	0.07	<.001	0.46, 0.70
Other-oriented perfectionism	-0.01	0.07	-.00	-0.02	.987	0.07	.979	-0.14, 0.14
Criterion Variable: Depersonalization								
Age	-0.02	0.01	-.17	-2.90	.004	0.01	.010	-0.03, -0.01
Gender	-0.19	0.13	-.08	-1.47	.143	0.13	.153	-0.45, 0.04
Self-oriented perfectionism	-0.17	0.07	-.17	-2.47	.014	0.07	.010	-0.30, -0.04
Socially prescribed perfectionism	0.38	0.06	.44	6.39	<.001	0.06	<.001	0.27, 0.48
Other-oriented perfectionism	-0.07	0.06	-.06	-1.18	.240	0.06	.231	-0.19, 0.04
Criterion Variable: Personal Accomplishment								
Age	0.00	0.01	.04	0.70	.485	0.01	.484	-0.01, 0.01
Gender	0.09	0.10	.05	0.89	.374	0.11	.397	-0.10, 0.34
Self-oriented perfectionism	0.20	0.06	.25	3.51	<.001	0.06	.003	0.08, 0.32
Socially prescribed perfectionism	-0.21	0.05	-.30	-4.23	<.001	0.05	<.001	-0.30, -0.11
Other-oriented perfectionism	0.07	0.05	.08	1.44	.152	0.05	.187	-0.03, 0.17

Note. B – Unstandardized regression coefficient. SE = Standard Error, β = standardized regression coefficient, t = t value, BCa = Bias corrected accelerated bootstrap estimates. $p < .05$, ** $p < .01$, *** $p < .001$, two-tailed. Exhaustion: $F(5, 292) = 21.51$, $p < .001$, $R^2 = .27$, adjusted $R^2 =$

.26; Depersonalization: $F(5, 292) = 11.74, p < .001, R^2 = .17, \text{adjusted } R^2 = .15$; Personal Accomplishment: $F(5, 292) = 4.75, p < .001, R^2 = .08, \text{adjusted } R^2 = .06$.