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Burn-out and employability rates are impacted by the level of job autonomy and workload among Dutch gastroenterologists

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Abstract

Background: Increasing burn-out rates among gastroenterologists make it necessary to find ways to prevent burn-out and to stimulate their ability and willingness to continue working (i.e., their employability). Understanding their antecedents might help organizations to prevent burn-out and to enhance employability among this occupational group.

Objective: The purpose of this study is to provide insight in the relationship between job characteristics and job crafting behavior on the one hand and job outcomes (burn-out symptoms and employability) on the other hand.

Methods: Data from two surveys in 2020 and 2021 were collected in a longitudinal study among 238 Dutch gastroenterologists. The data were analyzed with multiple linear regression analyses and paired-samples *t*-tests.

Results: Job characteristics, specifically job aspects that require sustained physical and/or psychological effort or skills (i.e., job demands), are important predictors of burn-out symptoms among gastroenterologists. Specifically, high quantitative and emotional workload are significantly related to more burn-out symptoms. No strong relationship was found between job crafting and burn-out symptoms. Furthermore, job aspects that reduce the negative impact of these demanding aspects and that help to achieve work goals (i.e., job resources), and job demands to some extent, significantly predict employability. In particular, high job autonomy is related to higher employability, and high quantitative workload is associated with lower employability. Job crafting does not significantly affect employability. Furthermore, levels of burn-out symptoms and employability differed only little across time.

Conclusion: In gastroenterologists, a high quantitative workload and emotional workload are associated with a higher burn-out risk, while low job autonomy and high quantitative workload are associated with more negative perceptions of employability. To prevent burn-out and to create positive perceptions of employability, it is important to take these aspects into account.

KEYWORDS
burn-out causes, burn-out symptoms, emotional workload, employability, gastroenterologists, job autonomy, job characteristics and job crafting behavior, prevention, quantitative workload, well-being

INTRODUCTION

"As a member of the medical profession: (1) I solemnly pledge to dedicate my life to the service of humanity, and (2) The health and well-being of my patient will be my first consideration." This part of the Hippocratic oath (art 1 and 2) shows physicians' strong focus on the well-being of others. Combined with a strong work ethic, this results in some physicians to "submerse themselves in their work and devote themselves to it until they have nothing left to give"—that is, they *burn out*.[1]

In a work environment that is centered around the well-being of patients, the well-being of physicians tends to be neglected. This may cause physicians to routinely self-sacrifice when serving their patients.[2] Scholars argue that there is a "culture of silence and stigma around mental issues" for physicians.[3] Only limited attention is paid to physicians' well-being in the short run and to their performance in the long run, for instance, to their ability and willingness to continue working in their profession (which is here referred to as their *employability*).[4]

Unfortunately, this "culture of silence and stigma" translates in increasing burn-out rates among physicians[5] and especially among gastroenterologists. A study by the American Medical Association with more than 7000 participants concluded that 37% of gastroenterologists reported burn-out.[6,7] This, together with lower employability rates in health care than in other sectors,[8] has raised awareness of topics related to physicians' well-being and employability. Where some years ago burn-out was still described as an "underrecognized threat to safe and high-quality care,"[5] high physician burn-out rates are now referred to as having reached "epidemic proportions"[9] and as an "occupational problem" which should be prevented rather than neglected.[6] Burn-out might result in turnover,[7] as physicians may be no longer employable. Given the pivotal position of physicians in the health care system, burn-out is thus not only an individual but also an organizational as well as societal problem, due to the organizational challenges and high costs associated with possible drop-out and turn-over in this occupational group.

This makes it necessary to find ways to prevent burn-out and to stimulate employability of physicians. Understanding the antecedents of these phenomena provides insights in the aspects organizations must invest in to prevent burn-out and to enhance employability. Studies in work psychology have shown that job characteristics are important antecedents of burn-out and employability. Job characteristics can be divided into *job demands*, which are job aspects that require sustained physical and/or psychological effort or skills, and *job resources*, referring to job aspects that reduce the negative impact of these demanding aspects and help to achieve work goals.[10,11] According to Job Demands-Resources theory,[11,12] high job demands have negative consequences for health, such as burn-out. In contrast, high job resources result in positive outcomes, such as high levels of engagement and job satisfaction.[12,13] In addition, studies have examined the relationship between job characteristics and employability. These studies suggest that job demands, like physical and emotional demands, negatively affect employability.[4,14] Note that the relationships between job characteristics on the one hand and job outcomes such as burn-out and employability on the other hand, vary for different occupations.[15] This emphasizes the need to study the relationships between job characteristics and job outcomes for gastroenterologists as well.

Further, studies have suggested that *job crafting* is an important antecedent of job outcomes such as well-being[16,17] and may also affect employability. Job crafting refers to the "self-initiated behaviors that employees take to shape and change their jobs."[18(p. 126)] Physicians can proactively lower the job demands that they perceive as hindering, or they could increase their social job resources. This, in turn, can enhance their well-being (e.g., lower burn-out symptoms) and may boost their employability.

Key summary

Summarize the established knowledge on this subject

- Increasing burn-out rates are seen in gastroenterologists
- There is a lack of understanding of the causes of burn-out in gastroenterologists

What are the significant and/or new findings of this study?

- Burn-out risk in gastroenterologists is associated with high quantitative and emotional workload
- Ability and willingness to continue working (i.e., employability) are associated with strong job autonomy and low quantitative workload
- Job crafting does not play a major role in developing burn-out symptoms and employability
- Organizations, professional associations and teams of physicians should take the aforementioned job characteristics into account to prevent burn-out and to stimulate employability

The present study addresses the research question: *What are the effects of job characteristics (job demands and job resources) and job crafting on job outcomes (burn-out symptoms and employability)?* In answering this question, this study responds to a recent call for more research on burn-out among gastroenterologists.[19] Studying employability next to burn-out will enhance insights on the possible impact of job characteristics on physicians in the near future. Insights from work psychology are used to interpret the findings, which helps in understanding the well-being of gastroenterologists.

METHODS

All gastroenterologists working in the Netherlands were invited to participate in a study about their work experiences in 2020 and 2021. Participants were asked to complete two online surveys separated by 8 months. These consisted of questions about job characteristics (i.e., autonomy, quantitative workload, emotional workload and physical workload), job crafting and job outcomes (i.e., burn-out symptoms and employability). Formal ethical approval was not needed as the University Medical Centre Utrecht indicated that this research fell outside the scope of the Dutch Law on Medical Research (WMO). Participants provided informed consent at the start of the survey.

Sample and descriptives

Two hundred and thirty-eight physicians completed the first survey (response rate: 29%). 77% of these physicians were medical specialists (n = 183) and 23% were residents (n = 55).

Fifty-two percentage was male (n = 124) and 48% female (n = 114). The average age of respondents was 44.6 (SD = 10.9). 55% was self-employed (n = 101) and 45% was contracted by their hospital (n = 82). Seventy-five physicians completed both surveys. This group consisted of 85% medical specialists (n = 60) and 15% residents (n = 11). Their average age was 45.6 (SD = 10.6). Fifty-seven percentage was self-employed (n = 34) and 43% was contracted by their hospital (n = 26). Further demographics of the study population are shown in Table 1. Table 2 shows the means, standard deviations and correlations of the main study variables.

Measures

Job characteristics were measured using validated scales.[20–22] Job autonomy was measured with three items (e.g., "The job allows me to decide on my own how to go about doing my work"; 1 = totally disagree−5 = totally agree; α = 0.652).[21] Quantitative workload was measured with three items (e.g., "Do you have too much work to do?", 1 = never−5 = very often; α = 0.871).[22] Emotional workload was measured with five items (e.g., "Is your job emotionally demanding?", 1 = never−5 = very often; α = 0.672).[22] Physical workload was measured with one item ("My job is physically demanding"; 1 = totally disagree−5 = totally agree).[20] These job characteristics were selected because research has shown that workload and autonomy are central job characteristics in many professions.[23] Moreover, these job characteristics are also relevant in the work situation of physicians, who have much professional autonomy[24] and a high workload.[25]

Job crafting was measured using two validated scales.[26,27] Job crafting towards strengths was measured with four items (e.g., "I organize my work in such a way that it matches my strengths"; α = 0.817).[26] Job crafting towards interests was measured with five items (e.g., "I actively look for tasks that match my own interests"; α = 0.783).[26] Job crafting to decrease hindering job demands was measured with six items (e.g., "I make sure that my work is mentally

TABLE 1 Demographics of participants

	T1 (n = 238)	**T2 (n = 75)**
Gender	Male: n = 124 (52%)	Male: n = 35 (49%)
	Female: n = 114 (48%)	Female: n = 36 (51%)
Age	M = 44.6, SD = 10.9	M = 45.6, SD = 10.6
Function	Physician: n = 183 (77%)	Physician: n = 60 (85%)
	Resident: n = 55 (23%)	Resident: n = 11 (15%)
Weekly work hours according to contract	M = 39.3, SD = 9.6	M = 39.5, SD = 9.6
Weekly work hours according to daily practice	M = 49.0, SD = 10.2	M = 49.1, SD = 10.2
Occupational tenure (years)	Physician: M = 13.7, SD = 10.3	Physician: M = 14.0, SD = 9.5
	Resident: M = 3.4, SD = 2.7	Resident: M = 2.9, SD = 2.9
Organizational tenure (years)	Physician: M = 11.0, SD = 8.8	Physician: M = 12.2, SD = 8.6
	Resident: M = 1.6, SD = 1.8	Resident: M = 0.9, SD = 1.3
Type of employment contract	Self-employed: n = 101 (55%)	Self-employed: n = 34 (57%)
	Contracted: n = 82 (45%)	Contracted: n = 26 (43%)

TABLE 2 Means, standard deviations and correlations of the main study variables of job characteristics (1–4), job crafting (5–8) and job outcomes (9–11)

				1	2	3	4	5	6	7	8	9		10		11	
		M	*SD*	T1	T1	T1	T1	T1	T1	T1	T1	T1	T2	T1	T2	T1	T2
1. Quantitative workload	T1	2.89	0.93	1	0.448**	0.378**	0.024	0.003	0.106	0.167*	0.216	0.447**	0.528**	−0.341**	−0.436**	−0.224**	−0.267*
2. Emotional workload	T1	2.41	0.44	0.495**	1	0.195**	−0.012	0.107	0.122	0.165*	0.094	0.404**	0.485**	−0.237**	−0.213	−0.086	−0.109
3. Physical workload	T1	2.93	0.87	0.368**	0.281*	1	0.371**	0.108	0.041	0.250**	0.121	0.323**	0.239*	−0.269**	−0.304**	−0.124	−0.058
4. Job autonomy	T1	3.54	0.44	−0.006	−0.102	0.289*	1	0.344**	0.249**	0.129	0.029	−0.040	−0.234*	0.197**	0.247*	0.162*	0.304*
5. Job crafting towards strengths	T1	3.16	0.74	0.092	0.067	0.056	0.388**	1	0.676**	0.171*	0.281*	0.010	−0.048	0.104	0.124	0.058	0.206
6. Job crafting towards interests	T1	2.82	0.68	0.235	0.225	−0.014	0.314*	0.683**	1	0.089	0.175	0.081	−0.028	0.037	0.196	0.007	0.245*
7. Job crafting to decrease job demands	T1	1.33	0.36	0.139	0.070	0.184	0.154	0.311*	0.166	1	−0.185	0.397**	0.129	−0.217**	−0.138	−0.013	−0.124
8. Job crafting to increase job resources	T1	2.43	0.47	0.216	0.094	0.121	0.029	0.281*	0.175	−0.185	1	−0.002	−0.002	−0.071	0.037	−0.104	−0.038
9. Burn-out symptoms	T1	2.20	1.12	0.526**	0.495**	0.230	−0.279*	−0.157	−0.089	0.169	−0.002	1	0.784**	−0.509**	−0.411**	−0.331**	−0.230
	T2	2.38	1.16	0.528**	0.485**	0.239*	−0.234*	−0.048	−0.028	0.129	−0.002	0.784**	1	−0.444**	−0.415**	−0.364**	−0.213*
10. Ability to continue to work	T1	3.77	0.94	−0.384**	−0.326**	−0.331**	0.337**	0.205	0.149	−0.206	−0.071	−0.438**	−0.444**	1	0.739**	0.651**	0.675**
	T2	3.72	0.87	−0.436**	−0.213	−0.304**	0.247*	0.124	0.196	−0.138	0.037	−0.411**	−0.415**	0.739**	1	0.645**	0.565**
11. Willingness to continue to work	T1	3.18	1.23	−0.415**	−0.194	−0.167	0.228	0.246	0.243	−0.083	−0.104	−0.384**	−0.364**	0.694**	0.645**	1	0.690**
	T2	3.08	1.22	−0.267*	−0.109	−0.058	0.304*	0.206	0.245*	−0.124	−0.038	−0.230	−0.213*	0.675**	0.565**	0.690**	1

NB. * = significant at $p < 0.05$, ** = significant at $p < 0.01$. Results for the sample at T1 ($n = 238$) are shown above the diagonal, results for the sample at T2 ($n = 75$) are shown under the diagonal.

less intense"; $\alpha = 0.703$).[27] Job crafting to increase social job resources was measured with four items (e.g., "I ask colleagues for advice"; $\alpha = 0.686$).[27] Answers for all job crafting dimensions were given on a 5-point Likert scale (1 = never, 5 = very often).

Burn-out symptoms were measured with five items of the Utrecht Burnout Scale that measured exhaustion as a core dimension of burn-out (e.g., "I feel emotionally drained from my work"; 1 = never−7 = daily; $\alpha_{T1} = 0.903$; $\alpha_{T2} = 0.905$).[28] Employability was measured with three items. Two of these tapped physicians' physical and mental ability to continue working in their current profession until the official retirement age. The third item assessed physicians' willingness to continue working in their profession until retirement (e.g., "I am physically able to continue to work until the age of 67 in my current profession").[4]

All items are presented in the Supplementary File on variables.

Statistical analysis

Data were analyzed with regression analyses using SPSS software version 27. Multiple linear regression analyses were done. First we focused on the cross-sectional data of T1 ($n = 238$) to examine whether job demands, job resources and job crafting at T1 predicted job outcomes at T1. Variables were entered in separate blocks. The first block consisted of demographics (gender, age, function; model 1). The second block included job characteristics (job autonomy, quantitative workload, emotional workload and physical workload; model 2). Finally, the third block consisted of the various dimensions of job crafting (towards strengths, towards interests, to decrease job demands and to increase job resources; model 3).

Then we conducted regression analyses using the longitudinal data set ($n = 75$) to examine whether job demands, job resources and job crafting at T1 predicted job outcomes at T2. Again, the variables were entered in blocks: demographics (block 1), job characteristics (block 2), job crafting (block 3), and the T1 measure of the relevant job outcome (block 4). Further, paired-samples *t*-tests were performed to examine whether the levels of burn-out symptoms and employability at T1 differed from those at T2. Cohen's *d* was used as a measure of effect size. Pairwise deletion was used for missing data.

RESULTS

Burn-out and job characteristics

All job demands correlate significantly positively with burn-out symptoms. The correlations are especially strong for quantitative workload and emotional workload, and slightly weaker for physical workload (Table 2). Thus, physicians who report a higher quantitative workload, emotional workload, and to some extent physical workload, are also more likely to experience burn-out symptoms. Job autonomy correlates significant negatively with burn-out symptoms (Table 2). Thus, if physicians perceive more job autonomy, they are less likely to report burn-out symptoms.

Multiple linear regression analyses show that job characteristics significantly predict burn-out symptoms, both cross-sectionally (F (7,58) = 4.332, $p < 0.001^{**}$, Table 3) and longitudinally (F (7,54) = 5.941, $p < 0.001^{**}$, Table 4). Job characteristics account for 28% of the variance in burn-out symptoms in the cross-sectional data, and for 35% of the variance in burn-out symptoms in the longitudinal data. Especially quantitative workload is an important predictor of burn-out symptoms (cross-sectional data: $\beta = 0.270$, $t = 2.086$, $p = 0.041^{*}$; longitudinal data: $\beta = 0.373$, $t = 2.992$, $p = 0.004^{**}$). Emotional workload to some extent predicts burn-out symptoms, as it relates significantly positively to burn-out symptoms in the longitudinal regression analyses ($\beta = 0.280$, $t = 2.265$, $p = 0.028^{*}$). This indicates that higher job demands (particularly high quantitative and emotional workload) result in more burn-out symptoms.

Burn-out and job crafting

Job crafting behavior does not significantly correlate with burn-out symptoms. Only job crafting to decrease hindering job demands correlates significantly positively with burn-out symptoms in the cross-sectional data, but this effect is not found longitudinally (Table 2).

Multiple linear regression analyses of the cross-sectional data show that job crafting significantly predicts burn-out symptoms and accounts for 11% of the change in burn-out symptoms (F (11,54) = 4.026, $p < 0.001^{**}$, Table 3). Unexpectedly, high levels of job crafting to decrease hindering job demands is associated with higher levels of burn-out symptoms. However, the corresponding longitudinal effect is not significant. A paired-samples *t*-test further shows that at T1 the level of burn-out symptoms do not differ significantly from T2 (Table 7).

Employability and job characteristics

Table 2 shows that high job demands are associated with lower employability perceptions, both in the cross-sectional and in the longitudinal data. This association is particularly strong for quantitative workload, which is negatively correlated with physicians' perceived ability to continue to work as well as their willingness to continue working. Emotional and physical workload are only significantly negatively associated with physicians' perceived ability to continue to work. Job autonomy correlates strongly positively with employability perceptions in both the cross-sectional and the longitudinal data. Thus, if physicians experience low job demands

TABLE 3 Outcomes multiple linear regression analyses of control variables, job demands, job resources and job crafting (independent variables) at T1 on burn-out symptoms (dependent variable) at T1 ($n = 238$)

	Model 1 β (SE)	Model 2 β (SE)	Model 3 β (SE)
Demographics			
Gender	0.159 (0.307)	0.135 (0.275)	0.174 (0.266)
Age	−0.100 (0.017)	−0.111 (0.015)	−0.187 (0.016)
Function	0.068 (0.425)	0.056 (0.391)	0.025 (0.386)
Job characteristics			
Quantitative workload		0.270 (0.159)*	0.285 (0.158)*
Emotional workload		0.240 (0.309)	0.201 (0.297)
Physical workload		0.196 (0.164)	0.169 (0.159)
Job autonomy		−0.064 (0.304)	−0.106 (0.305)
Job crafting			
Job crafting towards strengths			0.025 (0.249)
Job crafting towards interests			0.095 (0.226)
Job crafting to decrease hindering job demands			0.244 (0.364)*
Job crafting to increase social job resources			−0.182 (0.328)
R^2	0.065	0.343	0.451
ΔR^2	0.065	0.279	0.107
ΔF	1.426	6.155**	2.635*

NB. * = significant at $p < 0.05$, ** = significant at $p < 0.01$.

and high job resources, they are more positive about their employability.

Multiple linear regression analyses show that job characteristics significantly predict employability, both cross-sectionally (F (7,57) = 2.424, p = 0.030*; Table 5) and longitudinally (F (7,53) = 2.931, p = 0.011*; Table 6). Job characteristics account for 16% of the variance in employability in the cross-sectional data, and for 20% of the variance in employability in the longitudinal data. Especially job autonomy (cross-sectional data: β = 0.302, t = 2.229, p = 0.030*; longitudinal data: β = 0.324, t = 2.434, p = 0.018*), and to some extent quantitative workload (longitudinal data: β = −0.327, t = −2.302, p = 0.025*) are important predictors of employability. This shows that a high level of job resources (in this case job autonomy) and a low level of job demands (i.e., quantitative workload) affect employability positively.

Employability and job crafting

There are no strong correlations between job crafting behavior and employability perceptions (Table 2). This is in line with multiple linear regression analyses showing that job crafting does not significantly predict employability at T1 and at T2 (model 3), neither in the cross-sectional (Table 5) nor in the longitudinal data analyses (Table 6). Finally, a paired-samples t-test further shows that employability at T1 and employability at T2 do not differ significantly (Table 7).

DISCUSSION AND CONCLUSIONS

This study aimed to provide insight in the relationships between job characteristics (specifically job demands and job resources), job crafting, and job outcomes (burn-out symptoms and employability). A two-wave longitudinal research design was used to collect survey data from Dutch gastroenterologists.

The high prevalence of burn-out among physicians underlines the need for understanding how this can be prevented and how their employability can be stimulated.[5–7] As there is no standard list of specific job demands and job resources that are important to address when aiming to lower the risk of burn-out and to create an employable workforce, it is essential to examine which job demands and job resources are important in the work context of gastroenterologists.

This study shows that especially job demands are important predictors of burn-out symptoms. Specifically, gastroenterologists are more likely to experience burn-out symptoms when they experience a high quantitative workload and emotional workload. Results

TABLE 4 Outcomes multiple linear regression analyses of control variables, job demands, job resources, job crafting and burn-out symptoms (independent variables) at T1 on burn-out symptoms (dependent variable) at T2 (n = 75)

	Model 1 β (SE)	Model 2 β (SE)	Model 3 β (SE)	Model 4 β (SE)
Demographics				
Gender	0.199 (0.318)	0.172 (0.268)	0.217 (0.279)	0.104 (0.232)
Age	−0.049 (0.018)	0.114 (0.015)	−0.016 (0.017)	−0.093 (0.014)
Function	0.140 (0.491)	0.181 (0.422)	0.145 (0.421)	−0.011 (0.355)
Job characteristics				
Quantitative workload		0.373 (0.156)**	0.429 (0.163)**	0.173 (0.145)
Emotional workload		0.280 (0.329)*	0.279 (0.336)*	0.081 (0.291)
Physical workload		0.041 (0.165)	0.012 (0.170)	0.031 (0.138)
Job autonomy		−0.161 (0.309)	−0.153 (0.330)	−0.065 (0.271)
Job crafting				
Job crafting towards strengths			0.249 (0.286)	0.257 (0.232)
Job crafting towards interests			−0.205 (0.268)	−0.119 (0.219)
Job crafting to decrease hindering job demands			0.037 (0.384)	−0.061 (0.318)
Job crafting to increase social job resources			−0.219 (0.333)	−0.165 (0.271)
Job outcome at T1				
Burn-out symptoms T1				0.624 (0.125) (0.086)**
R^2	0.088	0.435	0.487	0.669
ΔR^2	0.088	0.347	0.051	0.183
ΔF	1.865	8.295**	1.253	27.073**

NB. * = significant at $p < 0.05$, ** = significant at $p < 0.01$.

further show that job resources, and job demands to some extent, are important predictors of employability. Especially gastroenterologists who experience more job autonomy are relatively positive about their employability, while gastroenterologists who experience a higher quantitative workload were less positive about their employability. These findings are in line with Job Demands-Resources theory,[11,12] which stresses the importance of good balance between job demands and job resources for employee health and well-being.

This study further examined the effect of job crafting on burn-out and employability. The present study among gastroenterologists could not replicate previous findings on job crafting as an effective strategy to prevent burn-out and increase positive perceptions on employability.[17,29] Perhaps professionals in this study were not familiar with how they can effectively craft their jobs. If so, training them how to do so might enhance their job crafting behavior, as was found in previous intervention studies.[16,30] In turn, this could positively affect their well-being, in line with previous job crafting intervention studies.[16,31] Future research could further explore if job crafting is an effective strategy to better deal with a highly demanding work environment by training physicians in how to engage in job crafting behaviors. The present study shows that these job crafting initiatives are more likely to be effective if they focus on handling a high quantitative workload, emotional workload and enhancing job autonomy.

Practical implications

This study provides information on the elements within the work environment of gastroenterologists that should be addressed if one aims to reduce the chances of occurrence of burn-out and to create an employable workforce. Two types of interventions can be distinguished: organization-directed interventions or person/physician-directed interventions.[32] This study shows that interventions will be most effective when they focus on quantitative workload, emotional workload and job autonomy.

Organization-directed interventions can focus on structural changes made to the work environment. These changes can entail finding strategies to lower quantitative workload, for instance by reducing administrative requirements. In addition, changes in the work environment can focus on ways to enhance or maintain the job autonomy of physicians. This may be particularly relevant for residents, who might perceive less autonomy in their work than senior physicians.

TABLE 5 Outcomes multiple linear regression analyses of control variables, job demands, job resources and job crafting (independent variables) at T1 on employability (dependent variable) at T1 ($n = 238$)

	Model 1 β (SE)	Model 2 β (SE)	Model 3 β (SE)
Demographics			
Gender	−0.226 (0.247)	−0.155 (0.240)	−0.171 (0.253)
Age	0.105 (0.014)	0.156 (0.013)	0.197 (0.016)
Function	0.083 (0.343)	0.166 (0.342)	0.181 (0.367)
Job characteristics			
Quantitative workload		−0.186 (0.139)	−0.202 (0.150)
Emotional workload		−0.056 (0.270)	−0.044 (0.282)
Physical workload		−0.220 (0.144)	−0.220 (0.151)
Job autonomy		0.302 (0.266)*	0.319 (0.290)*
Job crafting			
Job crafting towards strengths			−0.040 (0.237)
Job crafting towards interests			−0.015 (0.215)
Job crafting to decrease hindering job demands			−0.035 (0.346)
Job crafting to increase social job resources			0.090 (0.312)
R^2	0.068	0.229	0.238
ΔR^2	0.068	0.161	0.009
ΔF	1.485	2.984*	0.152

NB. * = significant at $p < 0.05$.

Physician-directed interventions can focus on equipping and supporting physicians in such a way that they can better cope with a demanding work environment. Job crafting training programs are an example of a strategy in this regard. This study shows that to prevent burn-out and to create positive employability perceptions, interventions should focus on ways that help physicians to better deal with a high quantitative workload and emotional workload, or to make better use of their job autonomy. Offering and communicating these possibilities is important, as research has shown that many physicians are currently unaware of relevant support services.[19]

Limitations

This study has several limitations. First, this study examines burn-out and employability by reporting the average scores of gastroenterologists on these variables, which does not shed light on potential outliers whose experiences may deviate from the results in this study. Future studies could take a qualitative approach to examine the potential differences between individual experiences to further understand the underlying mechanisms that reduce burn-out or that contribute to physicians' employability.

A second limitation of this study is the level of drop-out over time, which is a common drawback of longitudinal studies. Because of drop-out, a selection bias may affect the result.[33] Participants who have dropped out might differ from participants that completed all surveys. For instance, high job demands, such as a high workload might have caused participants to dropout. If this is the case, this has presumably led to a conservative estimation of the effects. The relationships between job demands on the one hand, and burn-out on the other, might have been even stronger if all participants would have completed all surveys. Future studies could examine this further by asking participants who do not want to complete a second or third survey for the reason of their withdrawal.

A third limitation of this study is that only one job resource was examined, namely job autonomy. Although job autonomy is a central job resource in many professions[23] and is particularly relevant for physicians who have much professional autonomy,[24] future studies could consider examining the effects of other job resources that seem relevant for gastroenterologists when studying burn-out or employability, such as task variety or social support.

Fourth, the cross-sectional nature of the data limits causal interpretation of the findings. For instance, the positive association found between job crafting to decrease hindering job demands and burn-out symptoms could indicate reverse causality. Job crafting to decrease job demands does not reduce the chances of experiencing burn-out symptoms, as was expected, but it could be the case that people who experience burn-out symptoms are more likely to engage in job crafting to cope with hindering job demands. However, this effect was not supported in the longitudinal

TABLE 6 Outcomes multiple linear regression analyses of control variables, job demands, job resources, job crafting and employability (independent variables) at T1 on employability (dependent variable) at T2 (n = 75)

	Model 1 β (SE)	Model 2 β (SE)	Model 3 β (SE)	Model 4 β (SE)
Demographics				
Gender	−0.233 (0.259)	−0.145 (0.245)	−0.169 (0.251)	−0.021 (0.181)
Age	0.090 (0.015)	0.045 (0.014)	0.130 (0.015)	0.131 (0.011)
Function	−0.012 (0.398)	0.031 (0.386)	0.080 (0.379)	0.007 (0.269)
Job characteristics				
Quantitative workload		−0.327 (0.142)*	−0.384 (0.147)*	−0.147 (0.108)
Emotional workload		0.086 (0.301)	0.038 (0.303)	0.104 (0.214)
Physical workload		−0.167 (0.151)	−0.084 (0.153)	0.011 (0.109)
Job autonomy		0.324 (0.282)*	0.257 (0.297)	0.074 (0.216)
Job crafting				
Job crafting towards strengths			−0.146 (0.258)	−0.269 (0.183)
Job crafting towards interests			0.324 (0.241)	0.197 (0.172)
Job crafting to decrease hindering job demands			−0.157 (0.346)	0.053 (0.255)
Job crafting to increase social job resources			0.106 (0.300)	0.161 (0.212)
Job outcome at T1				
Employability T1				0.763 (0.099)**
R^2	0.082	0.279	0.366	0.692
ΔR^2	0.082	0.197	0.087	0.326
ΔF	1.701	3.619**	1.671	50.765**

NB. * = significant at $p < 0.05$, ** = significant at $p < 0.01$.

TABLE 7 Paired-samples t-tests burn-out symptoms and employability at T1 and T2

	M	*SD*	*t*	*p*	Cohen's *d*
1. Burn-out symptoms at T1	2.197	1.116	−0.717	0.476	x
2. Burn-out symptoms at T2	2.261	1.130			
3. Employability at T1	3.508	1.011	0.839	0.405	x
4. Employability at T2	3.441	1.022			

data analyses. In the present study, the disadvantages of cross-sectional data analyses are limited as they are complemented with longitudinal data analyses.

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CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

ETHICS APPROVAL

The Ethical Committee of the University Medical Center Utrecht confirmed that this study fell outside the scope of the Dutch Law on Medical Research (WMO). Formal ethical approval was therefore not required.

PATIENT CONSENT STATEMENT

Not required, as no patients were involved in this study.

DATA AVAILABILITY STATEMENT

Raw data are available upon reasonable request. Ethical restrictions related to participant confidentiality prohibit the authors from making the dataset publicly available.

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APPENDIX A

Supplementary file 1. Scales for variables

Job characteristics

Quantitative workload

Measured with three items from the scale of van Veldhoven et al. (2014).

1. Do you have too much work to do?
2. Do you have to put in extra effort to finish your work?
3. Do you have to hurry?

Answers were given on a 5-point Likert scale (1 = never, 5 = very often; $\alpha = 0.871$).

Emotional workload

Measured with five items from the scale of van Veldhoven et al. (2014).

1. Is your job emotionally demanding?
2. Are you confronted in your work with things that affect you personally?
3. Are you in your work in contact with difficult patients or their relatives?
4. Do you have to convince or persuade people for your job?
5. Do you encounter emotionally demanding events in your work?

Answers were given on a 5-point Likert scale (1 = never, 5 = very often; $\alpha = 0.672$).

Physical workload

Measured with one item from Demerouti et al. (2009).

1. My job is physically demanding.

The answer was given on a 5-point Likert scale (1 = totally disagree, 5 = totally agree).

Job autonomy

Measured with three items from the scale of Morgeson & Humphrey (2006).

1. The job allows me to decide on my own how to go about doing my work.
2. The job provides me with significant autonomy in making decisions.
3. The job gives me a chance to use my personal initiative or judgment in carrying out the work.

Answers were given on a 5-point Likert scale (1 = totally disagree, 5 = totally agree; $\alpha = 0.652$).

Job crafting

Job crafting towards strengths and interests were measured with the scale of Kooij et al. (2017). Job crafting to decrease hindering job demands and increase social job resources were measured with the scale from Tims et al. (2012).

Job crafting towards strengths ($\alpha = 0.817$)

1. I organize my work in such a way that it matches my strengths.
2. In my work tasks I try to take advantage of my strengths as much as possible.
3. I look for possibilities to do my tasks in such a way that it matches my strengths.
4. I discuss the task division with my colleagues to make sure I can do tasks I am good at.

Job crafting towards interests ($\alpha = 0.783$)

1. I actively look for tasks that match my own interests.
2. I organize my work in such a way that I can do what I find interesting.
3. I make sure that I take on tasks that I like.
4. I start projects with colleagues that share my interests.
5. I engage in new relationships at work to make my work more interesting.

Job crafting to decrease hindering job demands ($\alpha = 0.703$)

1. I manage my work so that I try to minimize contact with people whose problems affect me emotionally.
2. I make sure that my work is emotionally less intense.
3. I organize my work so as to minimize contact with people whose expectations are unrealistic.
4. I organize my work in such a way to make sure that I do not have to concentrate for too long a period at once.
5. I make sure that my work is physically less intense.
6. I make sure that my work is mentally less intense.

Job crafting to increase social job resources ($\alpha = 0.686$)

1. I look to my colleagues for inspiration.
2. I ask others for feedback on my job performance.
3. I ask colleagues for advice.
4. I ask my professional association for advice.

Answers were given on a 5-point Likert scale (1 = never, 5 = very often).

Job outcomes

Burn-out symptoms

Burn-out symptoms were examined in five items measuring exhaustion from the validated UBOS survey,[28] the Dutch translation of the Maslach Burnout Inventory.[34]

1. I feel emotionally drained from my work.
2. I feel used up at the end of the workday.
3. I feel tired when I get up in the morning and have to face another day of work.
4. Working with people all day is really a strain for me.
5. I feel burned out from my work.

Answers were given on a 7-point Likert scale (1 = never, 7 = daily; $\alpha_{T1} = 0.903$; $\alpha_{T2} = 0.905$).

Employability

Employability was measured with three items.[4]

1. I am physically able to continue to work until the age of 67 in my current profession.
2. I am mentally able to continue to work until the age of 67 in my current profession.
3. I am willing to continue to work until the age of 67 in my current profession.

Answers were given on a 5-point Likert scale (1 = totally disagree, 5 = totally agree).