Tolerance for Uncertainty, Burnout, and Satisfaction With the Career of Emergency Medicine

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Study objective: Questions about burnout, career satisfaction, and longevity of emergency physicians have been raised but no studies have examined tolerance for uncertainty as a risk factor for burnout. Primary objectives of this study are to assess the role of uncertainty tolerance in predicting career burnout and to estimate the proportion of emergency physicians who exhibit high levels of career burnout.

Methods: A mail survey incorporating validated measures of career satisfaction, tolerance for uncertainty, and burnout was sent to a random sample of members of the American College of Emergency Physicians. Best- and worst-case scenarios of point estimates are provided to assess for the effect of nonresponse bias, and multivariable logistic regression was used to predict evidence of career burnout.

Results: One hundred ninety-three surveys were returned (response rate 43.1%). A high level of career burnout was exhibited in 62 (32.1%; best-worst case 13.8% to 64.1%) respondents. No demographic variables were associated with burnout status. The final model identified that high anxiety caused by concern for bad outcomes (odds ratio=6.35) was the strongest predictor of career burnout, controlling for all other variables.

Conclusion: A large percentage of emergency physicians in this study, 32.1%, exhibited emotional exhaustion, which is the core symptom of burnout. Emotional exhaustion was not related to age or type of practice and was not mitigated by training in emergency medicine. Physicians studied did not feel anxiety because of general uncertainty, difficulty in disclosing uncertainty to patients, or admitting errors to other physicians. High anxiety caused by concern for bad outcomes was the strongest predictor of burnout. Despite exhibiting emotional exhaustion, the majority of respondents are satisfied with the career of emergency medicine. [Ann Emerg Med. 2009;54:106-113.]

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INTRODUCTION

Since the recognition of emergency medicine as a specialty in 1979, questions about longevity, career satisfaction, and burnout of emergency physicians have been raised.[1-3]

The problem of burnout has been recognized in multiple human service industries since it was first mentioned in the scientific literature in a seminal article by Fruedenberger in 1974.[4] Although popular literature mentions the phenomenon of burnout in many areas of life, researchers agree that it occurs in people who "work with people."[5] Pines and Aronson[6] describe burnout as a "state of physical, emotional, and mental exhaustion caused by long term involvement in situations that are emotionally demanding." Freudenberger and Richelson[7] believe that it is a state of fatigue or frustration that comes about "when a way of life or relationship fails to produce the expected reward." Maslach[8] has stated that "...a pattern of emotional overload and subsequent emotional exhaustion is at the heart of the burnout syndrome." The Maslach Burnout Inventory measures burnout as a 3-dimensional syndrome of (1) emotional exhaustion (feeling emotionally drained by one's contact with other people), (2) depersonalization (negative feelings and cynical attitudes toward the recipients of one's service or care), and (3) reduced personal accomplishment (a tendency to evaluate negatively one's own work) that occurs among individuals who work with people in some capacity.[9-11] However, there is ongoing discussion as to whether burnout is multidimensional, consisting of all 3 dimensions, or is unidimensional, with emotional exhaustion as the central and essential state. A number of workers believe it is unidimensional, with emotional exhaustion being the essential requirement.[4,6,12-15] Emotional exhaustion can be considered central to burnout because it defines burnout to subjects when they are queried about what the meaning of burnout is for them, it is what correlates most strongly with global measures of

Editor's Capsule Summary

What is already known on this topic

Up to one third of emergency physicians complain of burnout, which has been correlated with dissatisfaction with career, increased number of shifts per month, and intention to leave practice.

What question this study addressed

To what extent does discomfort with clinical uncertainty predict burnout in emergency physicians?

What this study adds to our knowledge

In this survey of 193 emergency physicians, after controlling for demographic factors, anxiety about the potential for bad outcomes was the strongest predictor of career burnout.

How this might change clinical practice

This study will not change practice.

Research we'd like to see

Could interventions to enhance emergency physician tolerance for clinical uncertainty decrease symptoms of burnout?

burnout, and it appears to be the first component of burnout in those who go on to demonstrate the complete syndrome of burnout.[16] Shirom[15] has argued that detachment and a sense of low personal accomplishment should be dropped from the definition altogether and only emotional exhaustion retained because he considers it the core symptom. Others think that emotional exhaustion is the initial state, followed by personal detachment, which is a coping mechanism, and finally feelings of decreased personal accomplishment.[17]

The practice of emergency medicine involves dealing with multiple sources of uncertainty, combined with a very stressful environment, a combination of circumstances that appears to be frequently associated with burnout. In 2006, the Centers for Disease Control and Prevention reported that the number of emergency department (ED) visits was at a record high of 119.2 million, up from 115 million in 2005.[18] The decade from 1996 to 2006 has seen an increase in ED visits of 32%, whereas the number of EDs has decreased from 4,019 to 3,833.[19] Age groups with the highest visit rates per capita were infants younger than 12 months and the elderly older than 75 years, patients who are frequently difficult to examine and are very ill. About 2% of patients had been discharged from the hospital within 7 days before the current ED visit. More than 18 million patients, or 15.5%, arrived by ambulance and about 12% of ED visits resulted in hospital admission.[19] High volumes, high acuity, and high complexity of disease are now combined and result in the need for rapid decisionmaking in a highly ambiguous environment.[18]

Of the various studies that have looked for correlates to burnout among emergency physicians, none have considered tolerance for ambiguity. Ambiguity tolerance in medicine refers to an internal process that influences the way in which a person structures information about ambiguous situations when confronted by an array of unfamiliar, complex, or incongruent cues.[20] There is evidence that variation exists among physician specialty groups, including general internists, family practitioners, surgeons, and psychiatrists with regard to ambiguity tolerance.[21,22] The present study examines a sampling of emergency physicians with regard to this variable and its possible relation to burnout and career satisfaction.

The primary objectives of this study were to assess the role of uncertainty tolerance in predicting career burnout and estimate the proportion of emergency physicians who exhibit high levels of career burnout. A secondary objective was to assess satisfaction with the career of emergency medicine.

MATERIALS AND METHODS

This study was conducted with survey methodology. All members of the American College of Emergency Physicians (ACEP) with a mailing address on file with the ACEP organizational office, and actively practicing emergency medicine, were eligible for inclusion. This study was approved by the Human Investigations Committee.

The questionnaire was composed of 3 sections. The first section was the longest and included 79 questions, comprising 6 work-life satisfaction constructs: administrative autonomy, clinical autonomy, available resources, work relationships, lifestyle satisfaction, and challenges involved with practicing emergency medicine. These questions were taken from the Career Satisfaction Survey of Emergency Physicians, a validated and reliable instrument.[23] It is applicable for use with both Canadian and US emergency physicians.[24] Demographic characteristics were also collected.

The second section of the survey instrument was the Physicians' Reactions to Uncertainty: Refining the Constructs and Scales.[25] This 15-item, copyrighted measure was tested on 337 physicians in internal medicine and contains 4 scales: anxiety caused by uncertainty (α=.85), concern about bad outcomes (α=.74), reluctance to disclose uncertainty to patients (α=.76), and reluctance to disclose mistakes to physicians (α=.75).

The third and final part of the questionnaire contained the Maslach Burnout Inventory.[9,10] This survey is designed for workers in human services and health care and has been a widely used instrument to measure burnout since its introduction in 1981. It measures 3 dimensions of burnout: emotional exhaustion, depersonalization, and reduced personal accomplishment that occurs among individuals who work with people in some capacity, and has a scoring rubric, which categorizes each respondent into low, moderate, or high burnout levels for each scale.

Table 1. Psychometric properties of scale items.

Name of Instrument Scale	Number of Items	Previously Published Reliability	Observed Reliability in This Study
Revised Physicians' Reactions to Uncertainty Scales			
Anxiety due to uncertainty	5	0.86	0.90
Concern about bad outcomes	3	0.73	0.82
Reluctance to disclose uncertainty to patients	5	0.79	0.83
Reluctance to disclose uncertainty to physicians	2	0.72	0.88
Maslach Burnout Inventory			
Emotional exhaustion	9	0.90	0.91
Personal accomplishment	8	0.71	0.81
Depersonalization	5	0.79	0.65

The reliability (internal consistency) of each scale was calculated by Cronbach's coefficient α. See Gerrity et al[22] and Zalaquet and Wood,[11] for previously published reliability information for the Physicians' Reactions to Uncertainty Scales and the Maslach Burnout Inventory, respectively.

The scales of the Revised Physicians' Reactions to Uncertainty Scales and the Maslach Burnout Inventory were assessed for internal consistency using Cronbach's coefficient α. Table 1 demonstrates the high internal consistency in this population for each scale of the uncertainty and burnout measures. All of the subscales in the uncertainty measure and 2 of the 3 scales of the burnout inventory displayed higher internal consistency scores within this population than those previously published.[22,25]

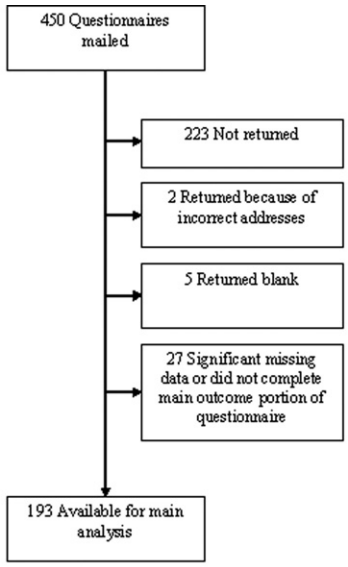
The primary outcome of "career burnout" was dichotomized into yes/no with a conservative definition of any respondent scoring in the highest category for any of the 3 scales of the Maslach Burnout Inventory measurement.[26]

All members of ACEP were eligible for inclusion. Structured Query Language (Microsoft SQL Server 2000 Standard Version, Microsoft, Redmond, WA), a standard interactive programming language for querying and modifying data and managing databases, was used to assign a random number to all the names in the ACEP membership database. A query was written to extract data from the table, order it by the random value, and select the number of random data entries needed for the sample. Because the sampling frame consisted of the ACEP membership list, containing approximately 22,000 members, it was possible to represent ACEP members as a population by developing an equal-probability simple random sample for study inclusion.

Sample size calculations were based on the ability to provide strong power (0.80) to address the primary objective of determining the role of uncertainty tolerance in predicting career burnout/career satisfaction, even when differences in proportions of physicians displaying low uncertainty tolerance was as small as 0.4 versus 0.6 and when the naturally occurring ratio of respondents with that characteristic was as low as 1:5. Furthermore, our sample size was also based on providing an estimate ($\pm$5%) of the proportion of emergency physicians who display high levels of career burnout. We assumed a 50% prevalence rate of career burnout. This proportion was chosen because it is the value at which the standard error is greatest, not because there is evidence to suggest the population prevalence of burnout is that large. However, with 50% as the a priori estimated proportion, and if the true proportion of physicians exhibiting burnout was significantly lower or higher, the precision of the estimate would ultimately be increased. With these assumptions, a sample size of 378 participants was determined to be required. We oversampled an additional 20% in anticipation of response failures, yielding a total sample size of 450.

Several methods were used in an attempt to acquire a high response rate to allow for a precise estimate of career burnout; however, the response rate was less important for the principal intent, which was to determine the role of uncertainty tolerance in predicting career burnout or dissatisfaction with the career of emergency medicine. Before dissemination of the questionnaire, notification postcards were sent to all selected participants. The notification postcard explained that the addressee had been randomly selected to participate in a survey study of emergency physicians' work-life satisfaction and would receive the questionnaire in approximately 2 weeks. A professionally printed questionnaire, the Emergency Physician Work Life Survey, was mailed to participants with a cover letter explaining cosponsorship of the study by ACEP and the authors' institution. We also submitted follow-up reminders by postcard, e-mail, and telephone calls to those ACEP members who did not respond to the mailed questionnaire. In addition, second questionnaires were mailed to those who did not respond within 1 month of the original mailing. In the first mailing, 450 surveys were sent, and in the second mailing 350 surveys were sent.

Because of the large number of items on the questionnaire related to work-life satisfaction, we created summary variables for each of the 6 constructs that the questions represented (administrative autonomy, clinical autonomy, ED resources, relationships within the ED, life stressors, and challenges presented by emergency medicine). Each item had a 7-point scale for response, ranging from –3 (strongly disagree) to +3 (strongly agree), with zero representing "neutral." Because some of the questions were positively worded (ie, "adequate attention is paid to my suggestions about the administration of my department") and some of the questions were negatively worded (ie, "I feel the administration frustrates my efforts to get committee work done"), we reverse coded the negatively worded items and then summed the answers and divided by the number of items that assessed each construct to obtain a summary statistic of satisfaction with each construct. Thus, higher positive summary scores indicate greater satisfaction with each construct. In addition, we chose to evaluate "discomfort with uncertainty" by categorizing respondents with scores on each



Note: Response rate (50.2%) was determined by the number of all responses (n=225) divided by the number of valid addresses (n=448), however, after removal of blank (n=5) and incomplete (n=27) questionnaires, the valid response rate was 43.1% (193/448).

Figure. Participant flow chart.

subscale that placed them in the 75th percentile or above for all respondents, indicating greater discomfort with each construct of uncertainty.

Primary Data Analysis

We report descriptive statistics, including means, medians, and proportions for the questionnaire items, construct summaries, and outcome measures. For medians, we report interquartile ranges, as represented by the 25th and 75th percentile values. SPSS version 16.0 (SPSS Inc., Chicago, IL) was used for all analyses.

Our primary outcome variable, career burnout, and all demographic and practice specific variables were assessed for bivariate associations with χ^2 tests and independent-samples *t* tests or Wilcoxon rank sums tests, as appropriate. We then developed a multivariable logistic regression model to assess the characteristics of physicians who exhibited high levels of career burnout by using all variables associated with workplace dissatisfaction and discomfort with uncertainty. No data were available to compare responders versus nonresponders for evidence of a response bias related to burnout. Therefore, we report unadjusted and adjusted odds ratios, along with an estimate of possible ranges based on best-/worst-case scenario of response bias for each variable.

RESULTS

As shown in the Figure, the response rate for this survey was 50.2% (n=220); however, only 43.1% (n=193) were used because of the removal of 27 cases with significant missing data or returned blank. In addition, there were 13 cases that were missing 1 response in the individual items that comprised the uncertainty scales. There were 5 cases that had up to 7 missing elements (of a possible 22 items) within the burnout inventory. Missing values within each subscale were replaced with imputed values obtained through an analysis of the linear trend at a point.

Of the responders, 62 (32.1%) exhibited high levels of career burnout, indicating that the minimum point estimate (best-case scenario) for the prevalence of career burnout would be 13.8% if all nonrespondents did not exhibit career burnout, and the maximum point estimate (worst-case scenario) would be 64.1% if all nonrespondents did exhibit career burnout.

The respondents of this survey, as shown in Table 2, were primarily men, with a median age of 41 years. The majority (84.5%) were trained in emergency medicine as a specialty and had practiced for more than 12 years. Most subjects practiced in

Table 2. Participant demographics (n=193).

Characteristic	Description
Sex, No. (%)	
Male	140 (72.5)
No answer	2 (1.0)
Median age, y (IQR)	41 (36–51)
Primary specialty training, No. (%)	
Emergency medicine	163 (84.5)
Family medicine	11 (5.7)
Internal medicine	9 (4.7)
Pediatrics	3 (1.6)
Other/missing	7 (3.6)
Mean (SD) years in practice in emergency medicine (n=190)	12.3 (8.6)
Median (IQR) number of clinical hours worked per month in the last year (n=183)	138 (104, 160)
Number of hospitals currently worked, No. (%)	
1	105 (54.4)
2	48 (24.9)
≥3	35 (19.1)
No answer	5 (2.6)
Annual volume of primary ED, No. (%)	
<30,000	32 (16.6)
30,000–49,999	74 (38.3)
50,000–79,999	54 (28.0)
>80,000	28 (14.5)
No answer	5 (2.6)
Physician coverage of primary ED, No. (%)	
Single physician coverage always	17 (8.8)
Multiple physician coverage always	46 (23.8)
Mix: Single/multiple physician coverage	126 (65.3)
No answer	4 (2.1)
Academic setting of primary ED	
University emergency medicine residency	28 (14.5)
University other residency	1 (0.5)
Community emergency medicine residency	25 (13.0)
Community other residency	47 (24.4)
Community, nonacademic	83 (43.0)
No answer	9 (4.7)

IQR, Interquartile range, as represented by the 25th and 75th percentile values. Two hundred sixty one surveys either incomplete or not returned.

Table 3. Comparison of respondents without and with high levels of burnout.

Summary Constructs From Survey	Low Burnout (n=131)	High Burnout (n=62)	Observed Unadjusted Odds Ratio	Possible Range According to Nonresponse Bias	Adjusted Odds Ratio
Work-life dissatisfaction, No. (%)					
Administrative autonomy	20 (15.3)	14 (22.6)	1.6	(0.3;31.1)* (0.1; 5.3)†	1.5
Clinical autonomy	29 (22.1)	25 (40.3)	2.4	(0.3;26.6)* (0.2; 8.3)†	1.8
ED resources	84 (64.1)	46 (74.2)	1.6	(0.1;10.5)* (0.3; 6.9)†	0.9
ED relationships	55 (42.0)	33 (53.2)	1.6	(0.2;13.7)* (0.3; 6.9)†	0.6
Emergency medicine challenges	17 (13.0)	19 (30.6)	3.00	(0.4;42.7)* (0.2; 9.6)†	2.2
Present lifestyle related to work	21 (16.0)	24 (38.7)	3.3	(0.4;38.5)* (0.3;11.0)†	1.8
Discomfort with uncertainty, No. (%)‡					
Anxiety caused by uncertainty	35 (26.7)	34 (54.8)	3.3	(0.3;28.3)* (0.4;12.2)†	1.7
Concern about bad outcomes	20 (15.3)	36 (58.1)	7.7	(0.7;62.1)* (0.6;25.3)†	6.4
Reluctance to disclose uncertainty to patients	32 (24.4)	21 (33.9)	1.6	(0.2;20.8)* (0.2; 5.7)†	1.1
Reluctance to disclose mistakes to physicians	36 (27.5)	22 (35.5)	1.5	(0.2;18.3)* (0.2; 5.4)†	1.6

*Possible range of odds ratios if all nonrespondents had burnout and (low; high) levels of dissatisfaction or discomfort with uncertainty.
†Possible range of odds ratios if all nonrespondents did not have burnout and (low; high) levels of dissatisfaction or discomfort with uncertainty. Adjusted odds ratios are the results of a multivariable logistic regression with observed data.
‡"Discomfort with uncertainty" was obtained by categorizing respondents with scores on each subscale that placed them in the 75th percentile or above of all respondents, indicating greater discomfort with each construct of uncertainty. Unadjusted odds ratios are the observed, bivariate relation between each characteristic and "burnout."

Table 4. Demographics of burnout and attrition study populations.

Demographics	ACEP Membership, 2007	Kuhn et al, 2007	Goldberg et al, 1996	Doan-Wiggins et al, 1995	Lloyd et al, 1994	Hall et al, 1992	Gallery et al, 1992
Sample size	25,614	193	1,272	768	268	539	763
Age, y	45	41	39	40	38	41	41
Board Certification, %	NA	NA	60	100	NA	87	NA
Male/female ratio	2.9:1	2.7:1	2.9:1	8.4:1	6.7:1	7.0:1	6.7:1

NA, Not available.

hospitals with some form of academic training program. None of the demographic variables were significantly different between those with and without the highest evidence of burnout.

We compared the responses to each questionnaire item for respondents who displayed high levels of career burnout versus those who did not. Figures E1 to E6 (available online at http://www.annemergmed.com) display the mean and 95% confidence interval for all respondents' ratings, with black lines representing those respondents with evidence of career burnout and light grey lines those who have none. Table 3 shows the bivariate correlations between burnout and dissatisfaction with the various summary constructs evaluated by the questionnaire. Dissatisfaction with the constructs of clinical autonomy, challenges of emergency medicine, and life stress were each significantly associated with high levels of burnout. In addition, Table 3 demonstrates that 2 of the subscales of the Physicians' Reactions to Uncertainty measure were related to career burnout (anxiety caused by uncertainty, and concern about bad outcomes).

A multivariable logistic regression model, using forced variable entry, was constructed by using all variables related to workplace dissatisfaction and discomfort with uncertainty to predict the presence of evidence for career burnout. The final model identified that high anxiety caused by concern for bad outcomes (odds ratio=6.35) was the single greatest predictor of career burnout, controlling for all other variables. Table 3 also shows the potential effect of best- and worst-case scenarios of the effect of a nonresponse bias.

We compared both the demographics (Table 4) and the burnout scores (Table 5) of our respondents to the demographics and burnout scores of respondents studied in other burnout and attrition studies.

LIMITATIONS

Limitations of this study include a low response rate. We had estimated a need for 378 surveys, but the low response rate resulted in our being able to analyze only 193 surveys. Because all surveys were anonymous, there was no way to compare the demographics or characteristics of respondents and

Table 5. Burnout scores, mean (SD), in burnout studies of emergency physicians.

Demographics	Kuhn et al, Survey ACEP Members (n=193)	Goldberg et al, Wellness Booth Registrants Physicians (n=1,272)	Lloyd et al, Canadian Emergency (n=268)	Malach and Jackson Medical Professionals (n=1,104)	Malach and Jackson General Population (n=11,067)
Emotional exhaustion	24.2 (11.2)	25.31 (8.55)	26.1 (11.3)	22.19 (9.53)	20.99 (10.75)
Depersonalization	13.0 (7.2)	20.70 (8.49)	16.5 (6.9)	7.12 (5.22)	8.73 (5.89)
Personal accomplishment	9.7 (7.0)	24.72 (9.17)	37.20 (7.6)	36.53 (7.34)	34.58 (7.11)

nonrespondents. It is also possible that respondents returning surveys had higher or lower burnout scores and lower tolerance for uncertainty than nonrespondents. To mitigate possible bias caused by nonrespondents, we have included best-/worse-case scenarios if nonrespondents were or were not burned out. Only emergency physicians who are members of ACEP were surveyed. Our intention was to study physicians in active practice, and we relied on respondents to self-report if no longer actively seeing patients. Our results and conclusions are based on the perceptions of the respondents, which may not be accurate and which can change with time, as is true of all survey studies. Compared to interviews, surveys may not obtain as complete or complex information. Factors not examined in our survey may affect burnout.

DISCUSSION

In the sample of emergency physicians studied, 32.5% experienced at least 1 aspect of the syndrome of burnout, specifically, emotional exhaustion. The feeling of emotional exhaustion is the core symptom of burnout. This finding of emotional exhaustion is not related to age or type of practice and is not mitigated by training in emergency medicine, a finding similar to that of Doan-Wiggins et al.[1] Furthermore, poor tolerance for uncertainty because of a concern for bad outcomes, rather than anxiety because of uncertainty per se, reluctance to disclose uncertainty to patients, or reluctance to disclose mistakes to other physicians, is strongly related to emergency physicians experiencing emotional exhaustion. High anxiety caused by concern for bad outcomes, with an odds ratio of 6.35, was the single greatest predictor of career burnout, as evidenced by emotional exhaustion, controlling for all other variables. The final model accurately predicted 54.8% of respondents with high evidence of career burnout and 87.0% of those without.

Studied physicians did not have scores demonstrating depersonalization or a low sense of personal accomplishment, which would indicate burnout in all 3 of the components of the burnout syndrome. Rather, almost one third of our physicians were emotionally exhausted, and this feeling was best predicted by intolerance for uncertainty related to bad outcomes. This suggests that, rather than being detached from their patients, emergency physicians are strongly emotionally involved with the people for whom they care and feel deeply sorry about what is occurring. Emotional exhaustion is the component of the burnout syndrome that seems to most overlap with other constructs such as depression and grief.[27]

Our study demonstrated that a large percentage of emergency physicians have only 1 component of burnout, emotional exhaustion, in contrast to the studies of emergency physicians and health care workers.[9,28,29] We found that 32% of our respondents exhibited a portion of the syndrome of burnout, which is lower than the 60% of physicians with moderate or high burnout studied by Goldberg[28] but higher than the 25% of physicians who stated that they felt "burned out" studied by Doan-Wiggins et al.[1] Because Doan-Wiggins et al[1] only asked the question "Do you feel burned out?" and did not use any scales to measure burnout, it is hard to compare our findings to theirs. In 1989, Keller and Koenig[30] found that 60% of the emergency physicians they studied scored moderate to high in the area of emotional exhaustion, 70% scored moderate to high in depersonalization, and 84% had a low sense of personal accomplishment. These numbers are higher than our findings.

The physicians in our sample are generally satisfied with their working conditions, although those physicians displaying higher scores for emotional exhaustion are less satisfied with working conditions and the career of emergency medicine, a finding that may reflect a general feeling of dissatisfaction with the job as a result of a higher level of emotional exhaustion. Intolerance for bad outcomes is a better predictor of emotional exhaustion than dissatisfaction with administrative autonomy, clinical autonomy, available resources, work relationships, lifestyle, or challenges involved with practicing emergency medicine because the majority of our emergency physicians appear to be satisfied with all aspects of emergency practice not related to uncertainty. Our sample is comparable in age, mean of 41 years, and sex, predominantly men, to multiple studies of burnout in emergency physicians.[1-3,28,29]

The danger of burnout is that it may lead to job turnover, absenteeism, low morale, and, most important, deterioration in the quality of care or service provided.[11] Despite exhibiting signs of burnout, the emergency physicians we studied are continuing to work in emergency medicine in a variety of settings, treating thousands of patients each year. Our study did not examine quality of care or patient satisfaction, but there is evidence from other specialties demonstrating increased patient dissatisfaction and lower compliance with care when patients are treated by physicians with low job satisfaction, those feeling

time pressure, or those under stress.[31-33] Our study did not show job dissatisfaction per se, as those studies did, but rather emotional exhaustion as a result of concern for bad outcomes.

Future studies need to examine patient satisfaction, the quality of care, and utilization of resources by physicians who have a high intolerance for bad outcomes. There also needs to be research conducted examining the health and emotional well-being of those emergency physicians who continue to work in the specialty despite feelings of emotional exhaustion.

Emergency physicians have poor tolerance for uncertainty because of a concern for bad outcomes, and this is a stronger predictor of burnout, defined as emotional exhaustion, than factors related to practice environment, age, or training. High anxiety caused by concern for bad outcomes, with an odds ratio of 6.35, was the single greatest predictor of career burnout, as evidenced by emotional exhaustion. They do not have intolerance for uncertainty except as it pertains to bad outcomes, suggesting that emergency physicians are comfortable with ambiguous states in general and handle uncertainty without increased stress except as this state pertains to bad outcomes for their patients. They are not depersonalized and feel an emotional connection with their patients. Although a large percentage of our respondents, 32%, demonstrated burnout, the majority of our respondents are satisfied with the career of emergency medicine. Despite exhibiting emotional exhaustion, the majority of respondents are satisfied with the career of emergency medicine.

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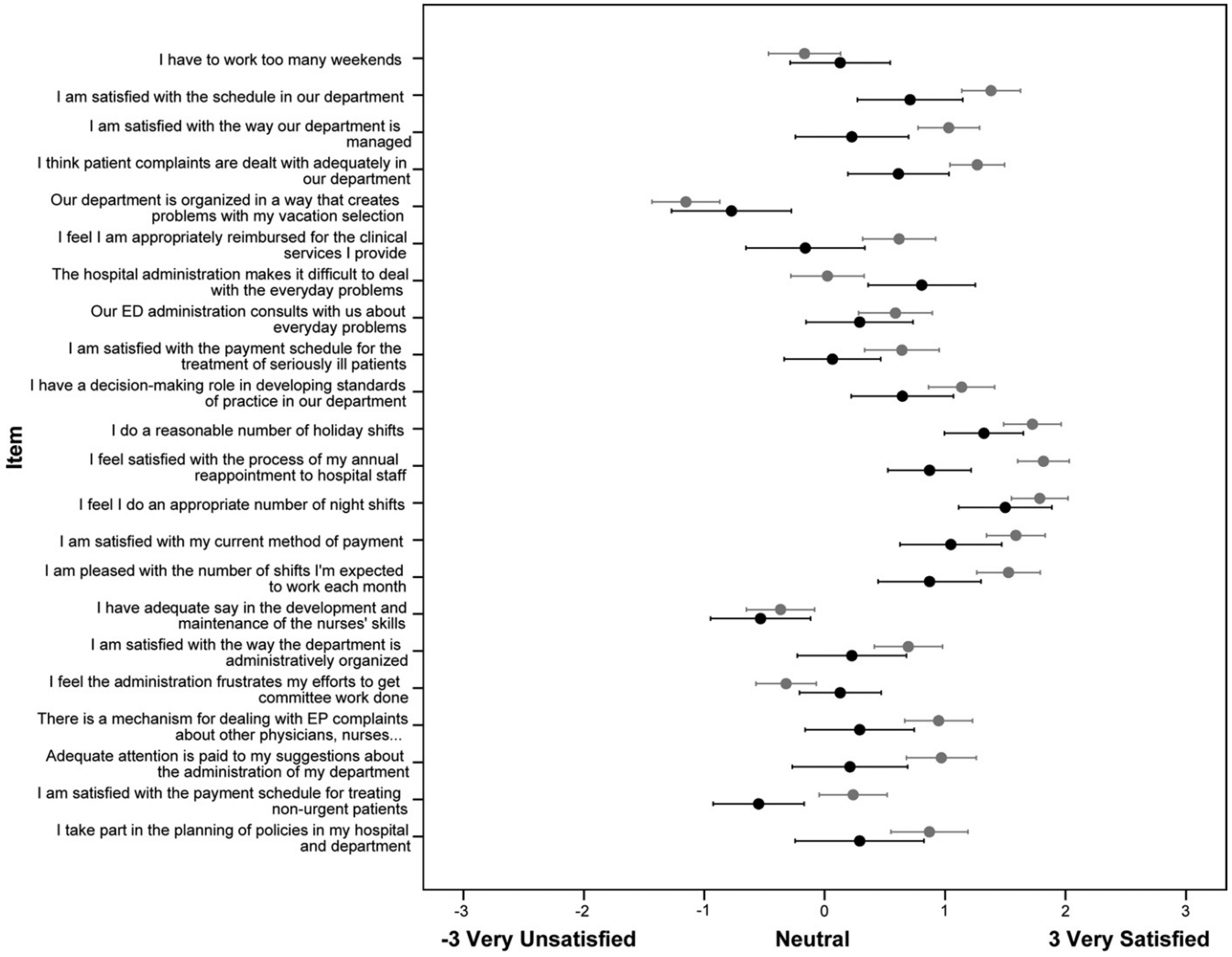

Figure E1. Respondents' assessment of administrative autonomy.

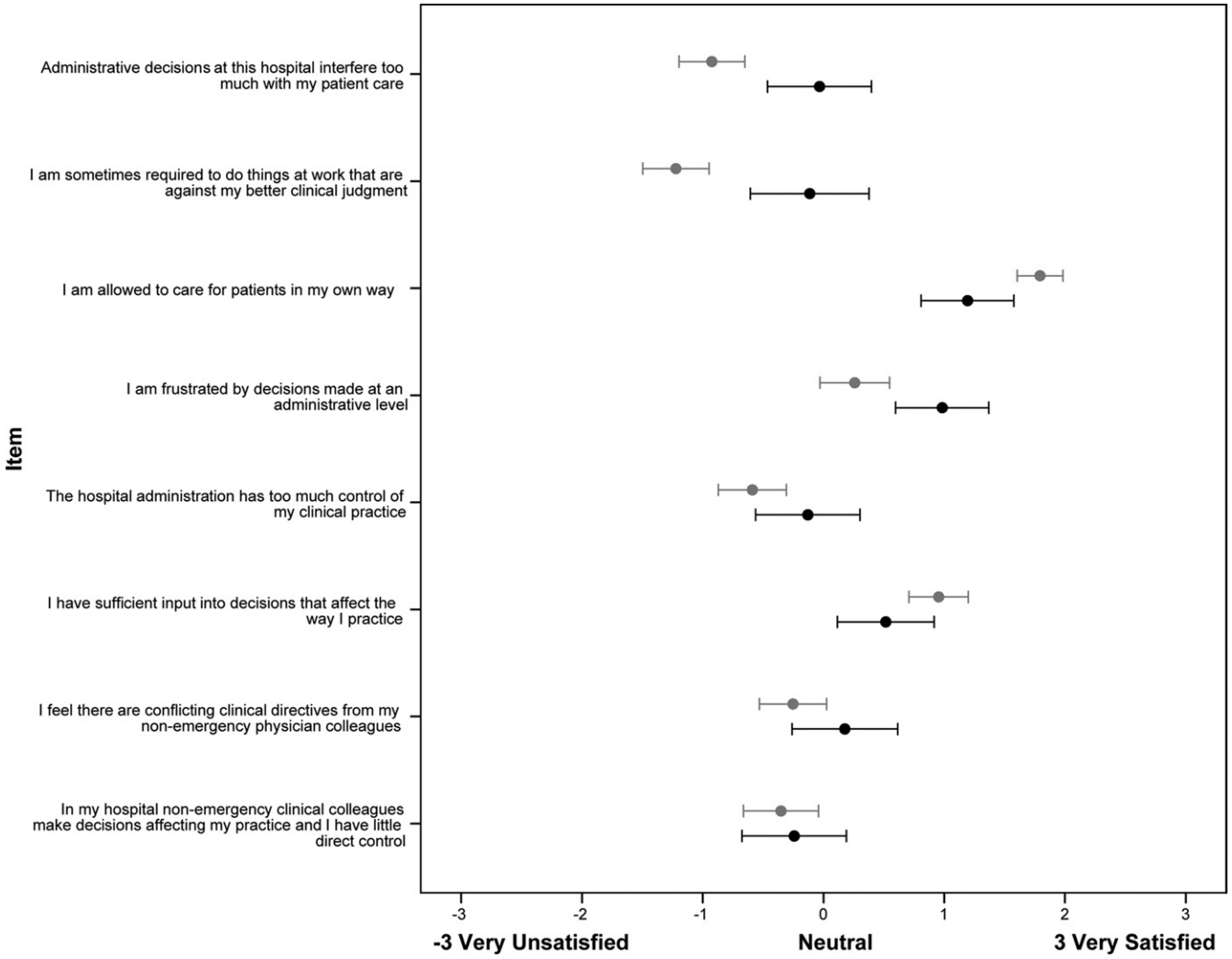

Figure E2. Respondents' assessment of clinical autonomy.

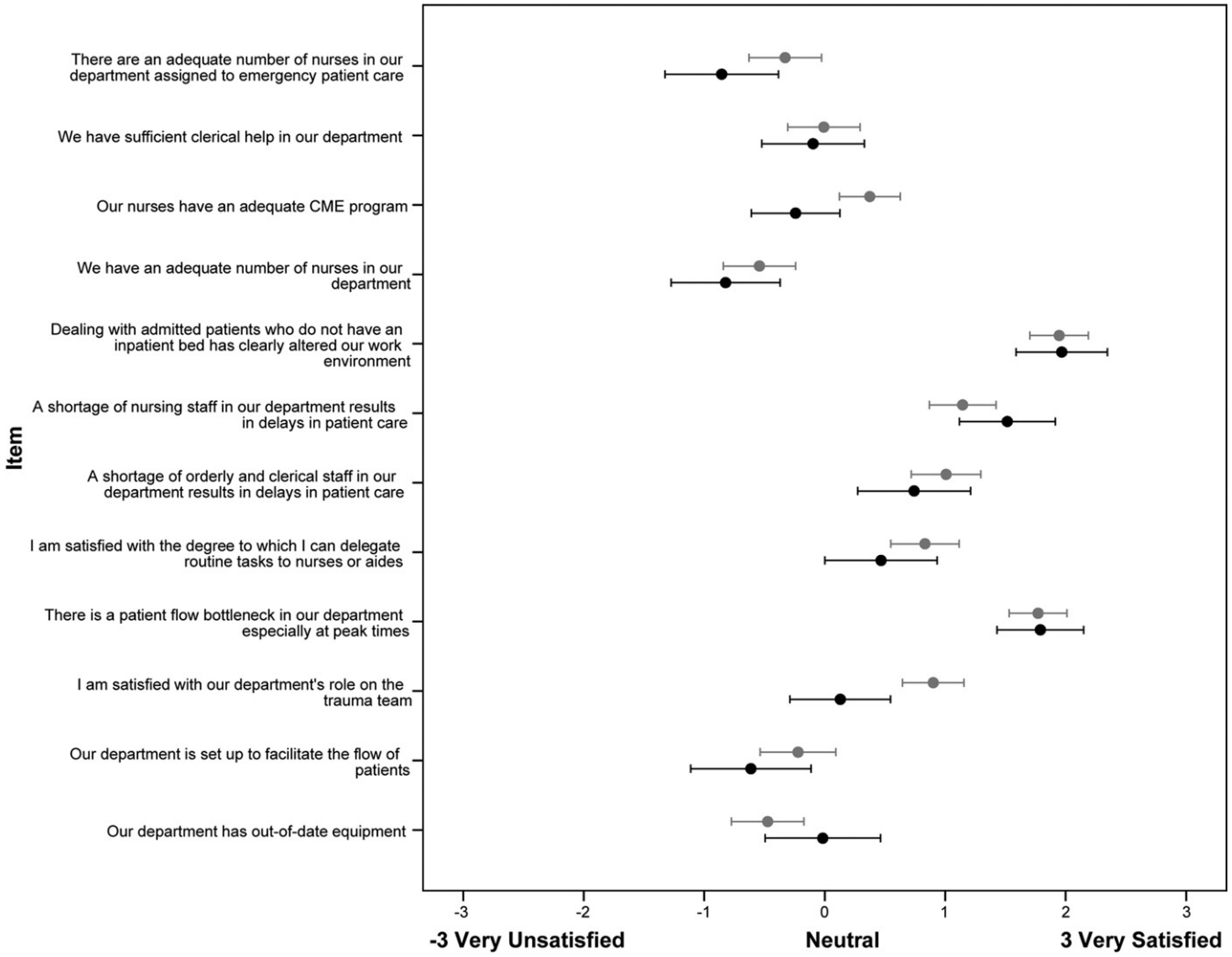

Figure E3. Respondents' assessment of ED resources.

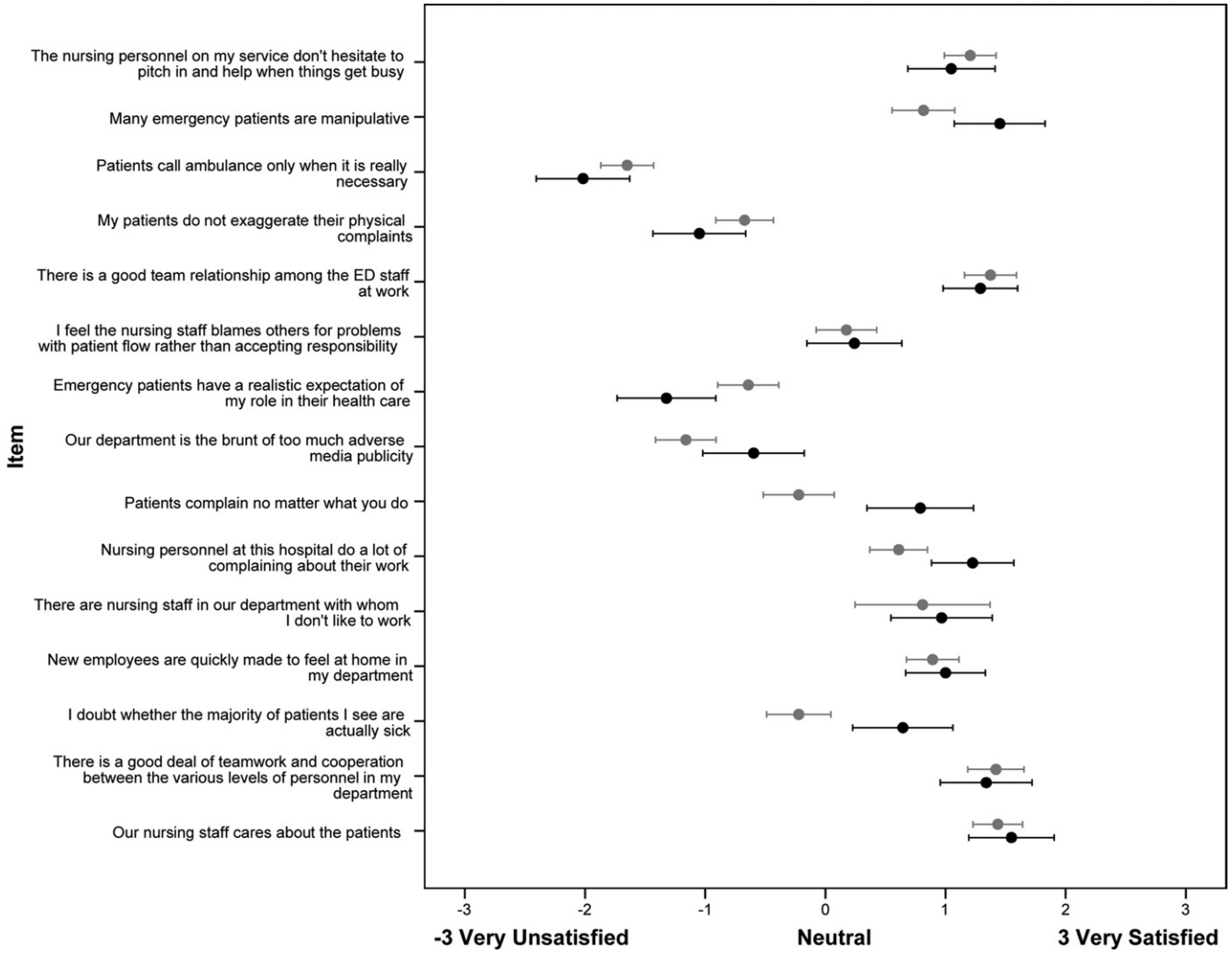

Figure E4. Respondents' assessments of relationships within the ED.

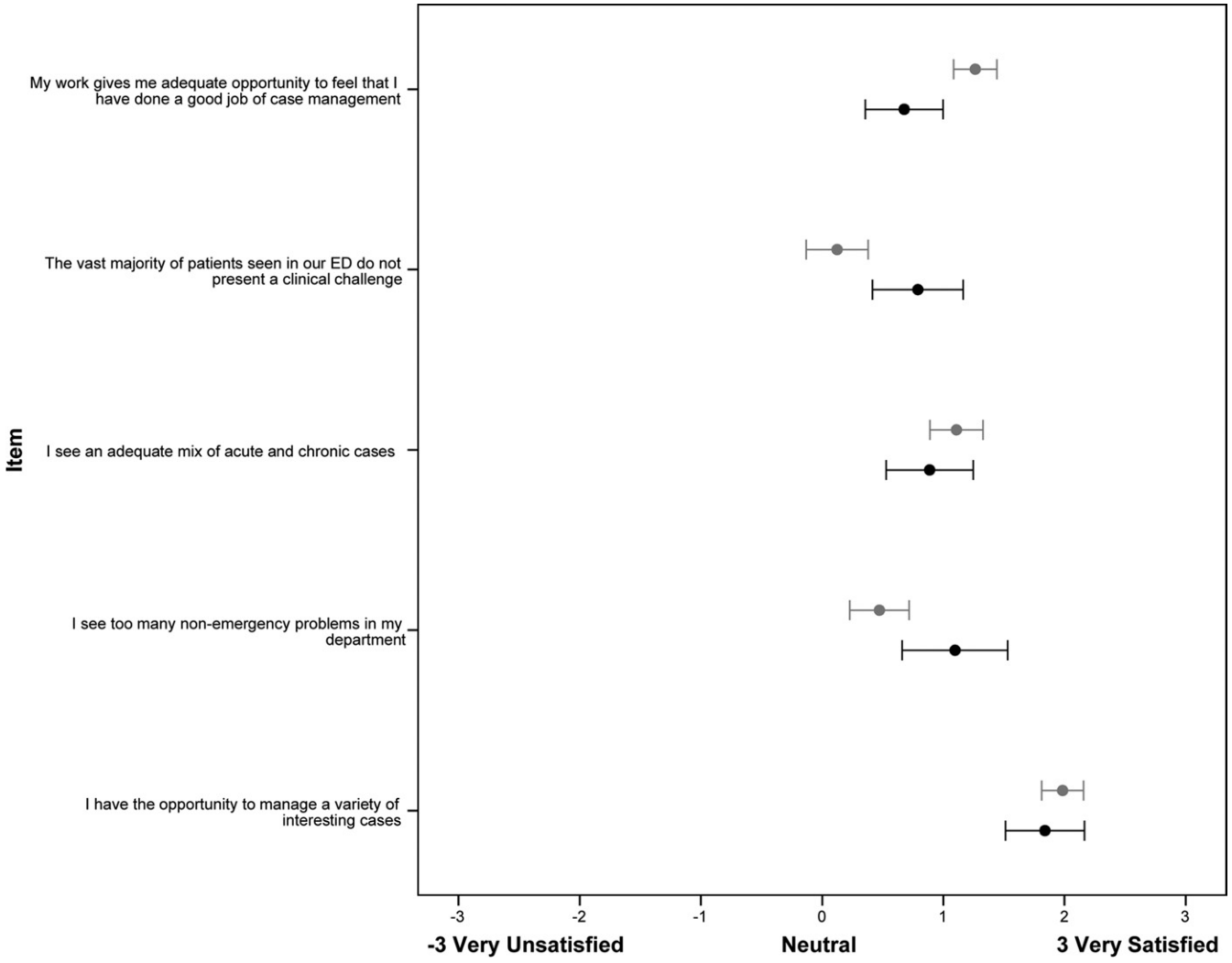

Figure E5. Respondents' assessments of challenges of emergency medicine.

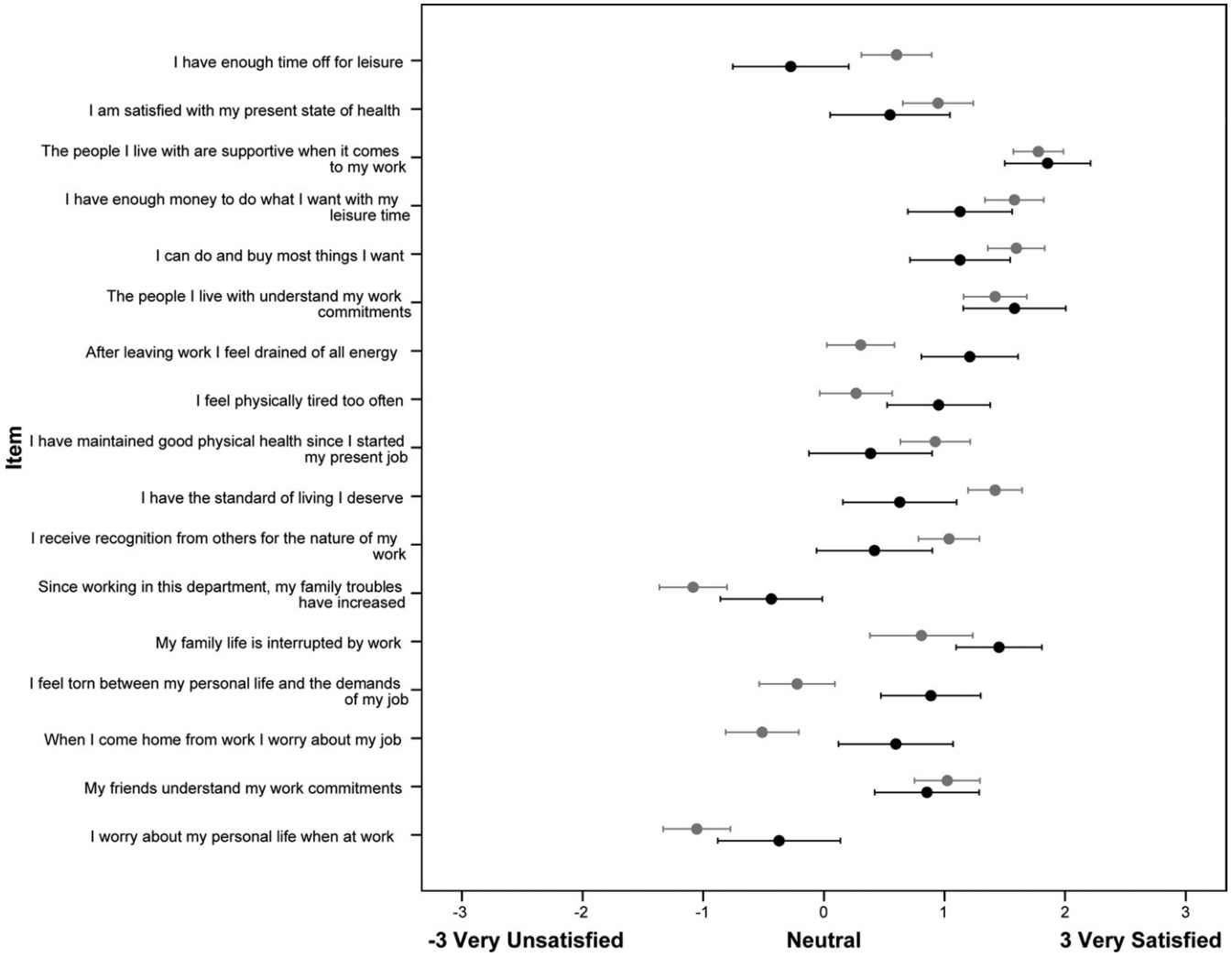

Figure E6. Respondents' assessments of life stress.