

The Stressed Executive: Sources and Predictors of Stress Among Participants in an Executive Health Program

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Abstract

Background: Stress is highly prevalent in the U.S. society, especially in executives, and is a well-documented risk factor for a wide range of medical disorders. Knowledge of common sources of stress and predictive factors may help identify executives at risk of high stress and allow us to appropriately refer them for stress management treatment.

Objective: The primary aim of this study was to identify common sources of stress, predictors of high stress, and other correlates among executives.

Methods: This was a cross-sectional survey of executives who requested a stress management consult at our institution. We abstracted the data from a 14-item intake survey as well as from the patient interview.

Results: Of the 839 executives, 827 executives (98.6%) who were referred for individual stress management consults completed the stress-related questions of the survey; 51.3% of these executives reported having a high stress level. Study participants mostly struggled with the well-being measures of sleep, anxiety, energy level, and diet. The majority reported that their main stressor was work related ($n = 540$, 64.4%) followed by family related ($n = 371$, 44.2%), health related ($n = 170$, 20.3%), and work-life balance ($n = 62$, 7.4%). In unadjusted analysis, high stress was associated with younger age ($P = .006$), lower quality-of-life scores ($P < .001$), and less physical activity ($P < .001$). In multivariable analyses, the strongest predictors for high stress level were younger age (odds ratios [OR] = 0.84, $P = .045$) and worse quality-of-life indicators such as anxiety (OR = 2.72, $P < .001$), diet (OR = 0.78, $P = .02$), and sleep (OR = 0.74, $P < .003$).

Conclusion: These findings suggest that executives with a high level of stress might be best helped through a multimodality stress management program. Our findings merit replication in larger studies and more definitive confirmation with prospective clinical trials.

Keywords

executive health, stress, stress management, occupational health

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Introduction

The World Health Organization has declared stress as the health epidemic of the 21st century.¹ This declaration is based on the high prevalence of perceived stress^{2,3} and its effect on the society.^{4–7} Chronic stress is a well-documented risk factor for various medical disorders, diseases, and symptoms.^{8–20} A particular demographic group with a high stress level is corporate executives.

The high prevalence of stress among executives^{5,21–31} is due in part to considerable performance pressure in a competitive world.²⁸ While executive stress is of concern in every population subset, the effect of stress among

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corporate executives has an outsized effect on the society because of their leadership roles and influence on their organizations, the stakeholders, and their employees. Management of corporate stress has considerable individual and societal value.

A proportion of executives have started opting for various stress management techniques and coaching^{21,28,31} to handle their stress levels and related symptoms. The triggers for their seeking help with stress management are unclear, as are the type of stressors and whether these stressors are associated with the quality of life. A thoughtful evaluation of stressors, lifestyles, and other characteristics that predict increased stress may inform health-care providers and wellness teams to design evidence-based approaches to better help executives with stress management.

The present study was designed to assess the most common sources of stress, predictors of high stress, and other correlates among a cohort of corporate executives participating in an executive health program at a large academic medical center.

Material and Methods

Study Design

This was a cross-sectional retrospective study of patients seen in the Department of Executive Medicine at our institution who were referred by their physician for individual stress management consult and completed the stress intake survey. The survey was an intake instrument designed to assess baseline measures of each participant. It was handed to the patient at the time they presented for the stress consult. The study protocol was approved by the institutional review board as a minimal risk study.

Patient Population

The Department of Executive Medicine at our institution sees patients for executive physical examinations. These patients are active executives or business owners and their spouses. There is significant heterogeneity in this group, as different companies send employees at different levels of management for the executive program based on their individual company policy.

Before their medical appointments, the executive patients were contacted regarding their medical concerns and specialty consultation requests and were further offered assorted services, including dietary counseling, travel clinic appointments, and stress management counseling. Appropriate requested appointments were prescheduled, and thereby, the patient evaluations at the clinic were finished in a timely manner.

For our study, we selected executive patients who underwent an individual stress management consult referred by their physician, consented to research authorization, and completed the stress intake survey between March 1, 2012, and July 31, 2016.

Survey Instrument

The survey instrument consisted of an intake survey to capture patients' information about their stress-related concerns. It addressed 14 items, and the survey categories included the symptoms the patient wanted to have addressed during the consult, inquiry about referral, stress level, and a number of well-being measures such as patient perception of pain level, energy level, anxiety, diet, interpersonal relationships, spiritual well-being, sleep, physical activity, and relaxation practice—which were all rated on a 5-point Likert-type scale.

New patients were requested to complete the survey while waiting for the consult. The patient-reported survey answers were entered in the Research Electronic Data Capture database tool hosted by the institution.

Data Abstraction

Patients' electronic health record database was used for additional data extraction. Demographic and clinical characteristics were obtained from the patient record, and stressor types were extracted from the consultation note.

Theory/Calculation

Survey responses were summarized with frequencies and percentages or mean (SD) and ranges as appropriate. Stress level was dichotomized as *high* (*high* or *very high*; 4 and 5 on the Likert-type scale) or *low to moderate* (*very low*, *low*, or *moderate*; 1, 2, and 3 on the Likert-type scale, respectively). The well-being measures were treated continuously on a scale from 1 (poor) to 5 (excellent). Categorical respondent characteristics were compared between those with high stress and those with low-to-moderate stress through χ^2 tests; continuous characteristics were compared with 2-sample *t* tests. Physical activity level and relaxation program practice frequency were compared between the 2 stress groups with Wilcoxon rank sum tests. Associations with high-versus low-to-moderate stress were also assessed with multivariable logistic regression models. *P* values less than .05 were considered statistically significant. All analyses were performed with SAS statistical software (version 9.4; SAS Institute Inc.).

Results

Demographic Characteristics

Between March 2012 and July 2016, a total of 839 executives received an individual stress management consult. Their ages ranged from 21 to 90 years (mean [SD], 55.3 [10.7] years; Table 1). The majority of responders (56.7%) were out-of-state patients. Mean (SD) body mass index (BMI) was 28.2 (5.2) kg/m², with 25.1% of participants having a normal BMI (<25 kg/m²). The majority also had hyperlipidemia (59.0%) and 32.4% had hypertension.

Survey Results

A total of 839 executives referred for individual stress management consults responded to the survey, of which 827 answered the survey questions regarding stress.

Table 1. Demographic Characteristics of 839 Executive Participants in Stress Management Consult.

Characteristic	Executive Patients ^a
Sex	
Female	269 (32.1)
Male	570 (67.9)
Age, years	
21–30	8 (1.0)
31–40	64 (7.6)
41–50	199 (23.7)
51–60	293 (34.9)
61–70	212 (25.3)
≥71	63 (7.5)
Mean (SD)	55.3 (10.7)
Range	21–90
Marital status	
Single	59 (7.0)
Married	717 (85.5)
Divorced	39 (4.6)
Legally separated	3 (0.4)
Widowed	14 (1.7)
Unknown	7 (0.8)
Location (n = 831)	
Minnesota	360 (43.3)
Out of state	471 (56.7)
Body mass index	
Normal (<25)	211 (25.1)
Overweight (25 to <30)	374 (44.6)
Obese (30 to <35)	175 (20.9)
Extreme obese I (35 to <40)	52 (6.2)
Extreme obese II (≥40)	27 (3.2)
Mean (SD)	28.2 (5.2)
Range	16.3–59.4
Hypertension	272 (32.4)
Hyperlipidemia	495 (59.0)
Diabetes mellitus	52 (6.2)

^aValues are presented as number and percentage of patients unless specified otherwise.

The majority (51.3%) admitted to having a high stress level (Table 2). Among the well-being measures of which participants struggled the most were sleep, anxiety, energy level, and diet. Two-thirds of patients reported moderate to heavy physical activity, and about one-half of participants indicated that they had used some kind of a relaxation program, with reading, prayer, and music being the most common.

Patient-Reported Stressor Categories

Figure 1 shows the data on patient-reported stress categories. Among all 839 patients, 341 (40.6%) reported

Table 2. Distribution of Stress, Well-being, and Physical Activity Measures Among 839 Executives Participating in Stress Management Consults.

Measure	Values ^a
Stress level (n = 827)	
Low to moderate	403 (48.7)
High	424 (51.3)
Quality-of-life score, mean (SD)	
Pain level ^b	1.9 (1.0)
Energy level ^b	3.1 (0.9)
Anxiety level ^b	2.8 (1.0)
Diet ^c	3.2 (1.0)
Relationships ^c	3.7 (0.9)
Spiritual well-being ^c	3.4 (1.0)
Sleep ^c	2.5 (1.0)
Overall health ^c	3.2 (0.9)
Usual physical activity level (n = 807)	
Almost none	38 (4.7)
Mild	234 (29.0)
Moderate	345 (42.8)
Heavy	190 (23.5)
Relaxation program practice frequency (n = 815)	
Not at all	439 (53.9)
A few times a month	161 (19.8)
A few times a week or more	215 (26.4)
Relaxation programs	
Reading	324 (38.6)
Prayer	282 (33.6)
Music	230 (27.4)
Deep breathing	152 (18.1)
Yoga	115 (13.7)
Meditation	94 (11.2)
Art	48 (5.7)
Guided imagery	23 (2.7)
Total relaxation programs, no.	
0	270 (32.2)
1 or 2	362 (43.1)
≥3	207 (24.7)
Mean (SD)	1.5 (1.4)

^aPresented as number and percentage of patients unless specified otherwise.

^bScale scores are 1, very low; 2, low; 3, moderate; 4, high; 5, very high.

^cScale scores are 1, poor; 2, fair; 3, good; 4, very good; 5, excellent.

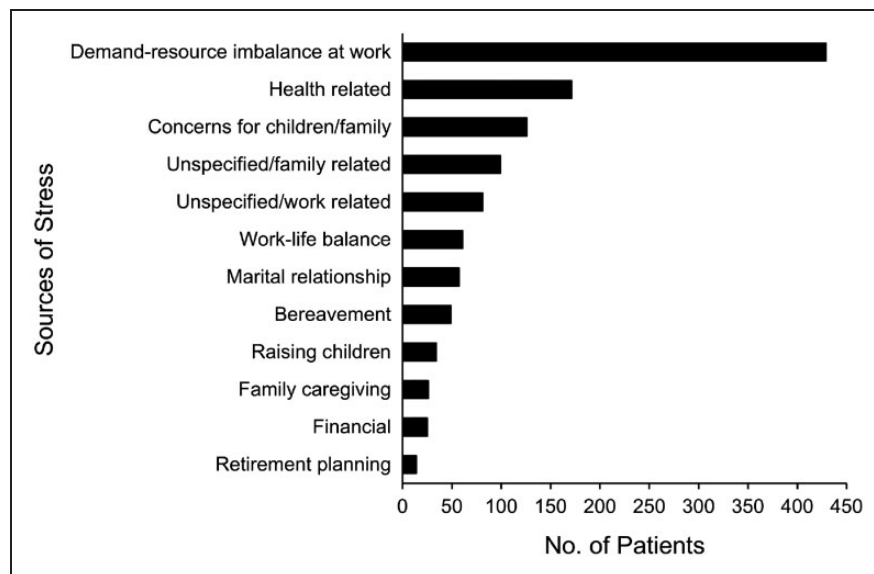


Figure 1. Sources of Stress Among Executives Participating in Stress Management Consults.

more than 1 type of stressor (mean number of stressors per patient, 1.29). The stressor was work related for 540 patients (64.4%), family related for 371 (44.2%), health related for 170 (20.3%), and work–life balance problems for 62 (7.4%). Under the work-related category specified by 540 patients, 428 patients (79.3%) reported “demand-resource imbalance” as the main grouping of work-related stressors.

Predictive Factors for High Stress Levels

Unadjusted analysis. In the unadjusted analysis (Table 3), the respondents with high stress tended to be slightly younger than those with low-to-moderate stress (mean age, 54.2 vs 56.3 years; $P = .006$). They also tended to have significantly worse well-being in all the quality-of-life domains measured; for most of the reported domains of pain, energy, anxiety, diet, sleep, relationships, spiritual well-being, and overall health, the P value was less than .001. The largest differences were observed for anxiety and sleep. Patients with low-to-moderate stress tended to participate more frequently in relaxation programs, especially reading ($P = .01$) and music ($P = .04$). Sex, BMI, marital status, and comorbidities were not significantly associated with stress.

Multivariable analysis. In a model that included sex, usual physical activity, relaxation program practice frequency, total relaxation programs, and age, the multivariable analysis showed that both physical activity and age were significant predictors for high stress (Table 4). The odds of a high stress level were lower for patients who had more physical activity than those who had almost none. For moderate activity, the odds ratio

(OR) (95% confidence interval [CI]) of high stress was 0.36 (0.17–0.77) ($P = .008$); for heavy activity, 0.42 (0.15–0.71) ($P = .005$), as compared with those with none or almost no activity. For mild activity, the OR (95% CI) was 0.51 (0.24–1.11) but was not significant. The odds of a high stress level tended to decrease with increasing age (OR [95% CI] for a 10-year increase, 0.87 [0.75–0.99]; $P = .04$).

In a second model that included each well-being measure—physical activity, age, and sex—physical activity was no longer significant. However, age continued to be significant ($P = .045$) with the same effect size as observed in the first model. Among the quality-of-life items, higher anxiety level ($P < .001$), worse diet ($P = .02$), and worse sleep ($P = .003$) were each predictive of high stress. Sex was not significant in the multivariable analysis.

Discussion

This study showed that among executives referred for individualized stress consult, the 3 main sources of stress in their lives were work, family, and health problems. Participants struggled most with sleep, anxiety, energy level, and healthy diet, and the largest difference between low and high stress level in the unadjusted model was observed for anxiety and sleep. Highly stressed participants also reported significantly less physical activity. In the 2 adjusted models, younger age was significantly associated with greater stress. By comparison, higher levels of anxiety, worse diet, and worse sleep were each predictive of high stress. Sex was not significant in the multivariable analysis.

Table 3. Comparison of Demographic Characteristics and Well-being Measures Among Executive Participants With Low-to-Moderate Stress Versus High Stress in Stress Management Consults.

Characteristic/Measure	Stress Level ^a		P
	Low to Moderate (n = 403)	High (n = 424)	
Sex			
Female	124 (30.8)	140 (33.0)	.49
Male	279 (69.2)	284 (67.0)	
Age, mean (SD), years	56.3 (10.9)	54.2 (10.3)	.006
Body mass index, mean (SD)	28.1 (5.2)	28.4 (5.3)	.35
Married status	351/400 (87.8)	356/420 (84.8)	.21
Hypertension	126 (31.3)	141 (33.3)	.54
Hyperlipidemia	247 (61.3)	239 (56.4)	.15
Diabetes mellitus	23 (5.7)	29 (6.8)	.50
Quality-of-life score, mean (SD)			
Pain level ^b	1.8 (1.0)	2.0 (1.1)	.02
Energy level ^b	3.2 (0.9)	3.0 (0.9)	<.001
Anxiety level ^b	2.4 (0.8)	3.2 (0.9)	<.001
Diet ^c	3.3 (0.9)	3.0 (1.0)	<.001
Relationships ^c	3.9 (0.8)	3.5 (1.0)	<.001
Spiritual well-being ^c	3.6 (0.9)	3.3 (1.0)	<.001
Sleep ^c	2.7 (1.0)	2.2 (0.9)	<.001
Overall health ^c	3.4 (0.8)	3.1 (0.9)	<.001
Usual physical activity level			
Almost none	10/392 (2.6)	28/406 (6.9)	<.001
Mild	98/392 (25.0)	134/406 (33.0)	
Moderate	180/392 (45.9)	159/406 (39.2)	
Heavy	104/392 (26.5)	85/406 (20.9)	
Relaxation program practice frequency			
Not at all	201/394 (51.0)	234/415 (56.4)	.06
A few times a month	76/394 (19.3)	84/415 (20.2)	
A few times a week or more	117/394 (29.7)	97/415 (23.4)	
Relaxation program			
Reading	173 (42.9)	145 (34.2)	.01
Prayer	143 (35.5)	136 (32.1)	.30
Music	124 (30.8)	104 (24.5)	.04
Deep breathing	75 (18.6)	77 (18.2)	.87
Yoga	59 (14.6)	56 (13.2)	.55
Meditation	45 (11.2)	48 (11.3)	.94
Art	18 (4.5)	30 (7.1)	.11
Guided imagery	12 (3.0)	11 (2.6)	.74
Total per patient, mean (SD), No.	1.6 (1.4)	1.4 (1.4)	.04

^aDenominator shown when not equal to column total.^bScale scores are 1, very low; 2, low; 3, moderate; 4, high; 5, very high.^cScale scores are 1, poor; 2, fair; 3, good; 4, very good; 5, excellent.

In 2007, the Center for Creative Leadership reported that 80% of executives described work as a major personal stressor.³² This is in contrast to the 40% of persons in the United States who acknowledged feeling very stressed in the 1999 report of the National Institute of Occupational Safety and Health.³³ Our study showed that 64.4% of the executive patients struggled with work-related stress, a percentage similar to that reported by the Center for Creative Leadership and about 50% more than the general U.S. population.

For executives, the stresses created by work were magnified because increased demands are made on their time. These demands include frequent and lengthy meetings, navigation of organizational bureaucracy, professional development of employees, and development and maintenance of business relationships. Secondary to the time demands of work, many executives also struggle with the stress of maintaining interpersonal relationships, including with family, which often leads to social isolation.³² This conclusion is

Table 4. Multivariable Comparisons to Assess Association of High Stress Among Executives Participating in Stress Management Consults.

Variable	Logistic Regression			
	Model 1		Model 2	
	OR (95% CI)	P	OR (95% CI)	P
Sex				
Female	Reference		Reference	
Male	0.93 (0.68–1.27)	.64	1.24 (0.84–1.81)	.28
Age (for 10-year increase)	0.87 (0.75–0.99)	.04	0.84 (0.71–1.0)	.045
Quality of life (for 1-level increase)				
Pain level ^a			1.01 (0.84–1.22)	.89
Energy level ^a			1.17 (0.92–1.49)	.20
Anxiety level ^a			2.72 (2.21–3.35)	<.001
Diet ^b			0.78 (0.63–0.96)	.02
Relationships ^b			0.84 (0.67–1.04)	.12
Spiritual well-being ^b			0.97 (0.79–1.20)	.80
Sleep ^b			0.74 (0.61–0.90)	.003
Overall health ^b			1.08 (0.83–1.41)	.57
Usual level of physical activity				
Almost none	Reference		Reference	
Mild	0.51 (0.24–1.11)	.09	0.58 (0.23–1.47)	.25
Moderate	0.36 (0.17–0.77)	.008	0.47 (0.18–1.19)	.11
Heavy	0.32 (0.15–0.71)	.005	0.53 (0.19–1.44)	.21
Relaxation program practice frequency				
Not at all	Reference			
A few times a month	1.04 (0.68–1.60)	.85		
A few times a week or more	0.86 (0.56–1.33)	.50		
Total programs (for 1-level increase)	0.95 (0.68–1.27)	.42		

Abbreviations: CI, confidence interval; OR, odds ratio.

^aScale scores are 1, very low; 2, low; 3, moderate; 4, high; 5, very high.

^bScale scores are 1, poor; 2, fair; 3, good; 4, very good; 5, excellent.

supported by our data, which showed that a majority of executives reported struggling with demand-resource imbalance at work as well as issues of work–life balance. Many of them reported more than 1 stressor in their life. These results depict that the high stress level of executives is a combination of work and other social or personal and ecological factors that are not related to work.

The relationship between stress and physical activity has been reported in prior studies, with self-care behaviors, including exercise, that decrease the higher stress level.^{34–37} The association of stress with worse sleep, anxiety, energy level, and diet has been reported previously and gives added impetus to provide stress management as an integral part of care for patients who are executives.

Our final adjusted multivariable models indicated that multilevel factors—younger age, higher anxiety level, poor sleep quality, and worse diet and physical activity levels—are strongly predictive of high stress levels among healthy executives. These results support previous studies that reported the association of anxiety and sleep quality and insomnia with stress levels.^{13,38–40} We also observed that younger executives are more

prone to psychological stress. Our study extends to the healthy executive group the association of poor dietary habits with stress that has been reported previously among working women, students, and adolescents.^{41–43} Prior studies also showed that improvement in diet quality and food types may lead to improved psychological resilience.^{44,45} Addressing good dietary habits might be worthwhile for executives with high stress levels.

Our study has several limitations. The study design was cross-sectional with no longitudinal follow-up. Thus, we can only suggest associations and cannot cite causation in this study. Further, the participants were a cohort of self-selected patients requesting assistance with stress management, thereby causing selection bias. With a study that relied on self-report measures, we recognize the inherent bias in such assessments. We also used Likert-type scales and not the more elaborate validated scales for assessing the well-being measures.

In 2017, the American Psychologic Association recorded the highest average level of stress ever measured in its annual *Stress in America* report.⁴⁶ While stress is a physiologic response to a physical or perceived threat and

has in small discrete episodes important survival benefit, prolonged stress has been linked to worsening in physical health, mental health, health behaviors, and the quality of life.³⁴ These stressors can occur in the personal, family, community, or work realm.

At this time, work appears to account for a disproportionately large share of stressors due to numerous workplace variables, including political issues and hierarchy, career development goals, institutional culture, job-related demands, and performance metrics that may influence continued employment and promotion.⁴⁷ Work-related stress has been associated with increased use of sick leave, poor job satisfaction, cynicism, presentism, and, ultimately, burnout.⁴⁸ Investigators have further established that chronic stress impairs intellectual functioning, formation of memories, and recall.^{49,50} These changes are concerning for workers but are especially concerning for executives, who may have a larger societal impact. Our study adds strength to the evidence that stress management training is needed,^{36,37} particularly in formats that are brief and scalable for the executive patient.^{37,51,52} Corporations may want to consider offering these programs to their employees and investigate the effect of changes in the work environment on perceived stress.

Conclusions

We determined that work, family life, and health concerns are the primary source of stressors among executives seeking consult for stress management. We also found that executives struggle most with poor quality sleep, anxiety, low energy levels, physical activity, and not eating a healthy diet. We noted a robust association of younger age with high stress. The findings of our study suggest that executives with high levels of stress might be best helped by a multimodality stress management program.

Future large prospective cross-sectional studies would be helpful in determining the effects of modifying individual correlates of stress and the effect of changes in work culture at various management levels and leadership positions.

Declaration of Conflicting Interests

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