EFFECTS OF STRESSFUL LIFE EVENTS IN YOUNG BLACK MEN WITH HIGH BLOOD PRESSURE

Objectives: 1) To describe stressful life events as experienced by a sample of young Black men with high blood pressure (HBP) living in inner-city Baltimore, Maryland; and 2) to examine the effect of cumulative stressful life events on substance use, depression, and quality of life.

Methods: Data were obtained over 48 months by interview from 210 men in an HBP management study.

Results: Stressors repeatedly occurring over time included death of family member or close friend (65.2%), having a new family member (32.9%), change in residence (31.4%), difficulty finding a job (24.3%), and fired or laid off from work (17.6%). Involvement with crime or legal matters was reported at least twice during the 48 months by 33.3% of men. When a cumulative stressful life events score was calculated by summing the number of events experienced at 6-month points over 48 months and tested for its relationship with the health outcomes, the findings of multivariate analyses revealed significant associations between cumulative life stressors and depression and quality of life. No significant relationship was found between stressful life events and substance use.

Conclusions: The results suggest that cumulative stressful life events have a negative effect on mental health and quality of life in young Black men with HBP. Future study should focus on developing interventions to assist individuals in managing distress related to stressful events with necessary community resources. (*Ethn Dis.* 2006;16:64–70)

Key Words: Black Men, High Blood Pressure, Stressful Life Events

From the School of Nursing (HRH, MTK, LR, CD, MNH), Bloomberg School of Public Health (LB), Johns Hopkins University, Baltimore, Maryland

Address correspondence and reprint requests to Hae-Ra Han, RN, PhD, Assistant Professor; Johns Hopkins University School of Nursing; 525 N. Wolfe Street; Baltimore, MD 21205-2110; 410-614-2669; 410-614-1446 (fax); hhan@son.jhmi.edu Hae-Ra Han, PhD, RN; Miyong T. Kim, PhD, RN; Linda Rose, PhD, RN; Cheryl Dennison, PhD, RN; Lee Bone, MPH, RN; Martha N. Hill, PhD, RN

INTRODUCTION

Stressful life events, a measure of quantifying stress, include a range of both positive and negative life events of sufficient magnitude to change one's usual activities.1 According to Dohrenwend et al,1 three clusters of major negative events exist: fateful loss events (eg, death of family or loss of home because of disaster), severe physical illness or injury, and major loss of social support (eg, separation, divorce). Although some counter examples exist,^{2,3} psychological stress from stressful life events is a predisposing risk factor for substance use^{4,5} and a variety of mental and physical illnesses such as depression,^{6,7} cancer,⁸ coronary heart disease.^{9,10} and AIDS.^{11,12} Moreover, stressful life events have demonstrated a harmful effect on the outcome of disease in patients with AIDS,13 cancer,¹⁴ multiple sclerosis,^{15,16} bipolar disorder,¹⁷ and cardiac events.¹⁸

Inner-city young Black men with high blood pressure (HBP) face special challenges not only because of their HBP, which requires ongoing selfmanagement and care, but also because of a high likelihood of living in a stressful residential environment where poverty and crime are common. The harsh environment, often combined with a lack of support system and healthcare resources, contributes to increased risk for HBP complications such as stroke and end-stage renal disease in urban Blacks.¹⁹⁻²¹ Despite these circumstances, little or no research attention has been directed toward describing life events that are experienced by this group of men and how these life events affect their health outcomes.

The harsh environment, often combined with a lack of support system and healthcare resources, contributes to increased risk for HBP complications such as stroke and end-stage renal disease in urban Blacks.^{19–21}

Previously, Hill and colleagues¹⁹ reported that in a sample of 309 innercity Black men with HBP, only 27% were employed either full-time or parttime, nearly three-quarters (71%) had an annual income <\$10,000, and approximately two-thirds (64%) reported a history of incarceration. The purposes of this study were two-fold: 1) to describe stressful life events at eight time points over 48 months, as experienced by the same sample; and 2) to examine the effect of cumulative stressful life events on alcohol and illicit drug use, depression, and quality of life (QOL) at 48-month follow-up. We predicted that more cumulative stressful life events would predict more negative health outcomes as manifested by more alcohol and illicit drug use, more depression, and lower QOL in this sample of young, inner-city, Black men with HBP living in Baltimore, Maryland.

Methods

Subjects and Setting

Longitudinal data from a randomized clinical trial to improve HBP care and control in 309 young, Black, urban men were used. Research assistants identified hypertensive male patients by abstracting emergency department medical records, contacting participants in a prior study, encouraging word of mouth, and advertising locally. Black men between the ages of 18 and 54 years and residing in inner city Baltimore, Maryland, were eligible for inclusion if their systolic BP (SBP) was ≥140 mm Hg and/or diastolic BP (DBP) was ≥90 mm Hg on two separate occasions or they were on antihypertensive medication. Potential participants were ineligible if they failed to meet these inclusion criteria, suffered from a terminal condition or cognitive impairment, were on hemodialysis, or were participating in another study or service program that would interfere with this study.

A total of 309 men who met the criteria were randomly assigned to either special intervention (n=157) or usual-care groups (n=152) (see Hill et al²⁰ for details about the intervention). The more intensive (MI) intervention consisted of individualized nursing care provided by a team of nurse practitioner, community health worker, and medical doctor, free HBP medication, annual home visits, and telephone follow-up. The less intensive (LI) intervention consisted of minimal HBP education and referral to a medical doctor, if they were not in HBP care. Over the four-year period of this clinical trial, 43 men died of various causes (narcotic or alcohol intoxication for 40% of the deaths [n=17] and CVD-related causes for almost 23% [n=10]), 23 were incarcerated, and data on 26 men were not available for other reasons (eg, refusal, moving to another state, hospitalized, work conflict, etc), resulting in a total of 217 men (118 in the MI and 99 in the LI groups). After excluding those with missing responses by listwise deletion, the final sample for this analysis was 210 men.

Procedure

After approval by the institutional review board, subjects were enrolled and evaluated at the general clinical research center at the Johns Hopkins Hospital. Data were collected over a 48-month follow-up period. At each annual visit, which lasted approximately two to three hours, a series of sociodemographic, psychological, and physiologic variables were measured through interviews by trained staff who were blinded to group assignment. At six months between each annual visit, participants were telephoned to maintain contact and assess stressful life events. For those who did not have a telephone of their own, arrangements were made to interview them at someone else's home. Every participant was provided with financial incentives at completion of each annual visit (\$35 at baseline and 12 months, \$50 at 24 months, \$65 at 36 months, and \$75 at 48 months).

Measurements

The occurrence of 23 specific life events during the six months preceding each man's follow-up interview was documented by using a checklist developed for this study. These events included areas of health, work, residence, love and marital relationship, family, and crime or legal matters. Included events were population- and environment-specific (eg, drug overdose, gunshot wound) and diseasespecific (eg, renal failure) and included undesirable life events (eg, death, interpersonal problem, financial problem, or legal problem). Subjects indicated which of the 23 stressors they had experienced during the six months before follow-up. The score was computed by giving each of the yes responses a score of 1 and no a score of 0. The yes responses were summed to arrive at a score for the life events questionnaire. High scores indicated a substantial number of stressful life events, representing potentially high levels of stress.

Alcohol intake was assessed at 48 months by six items that indicated the frequency of drinks of beer, wine, and hard liquor within the past 30 days (number of days per week) and the amount of each type of drinks usually consumed on a typical day during the reference period. One drink was defined in this study as 12 oz of beer, 4 oz of wine, or 1 oz of hard liquor.

Assessment of illicit drug use at 48 months was provided by self-report as well as a urine test for cocaine, opiates, barbiturates, cannabis, and benzodiazepines. Those who either self-reported illicit drug use or had a positive urine test result were identified as positive for illicit drug use at 48-month follow-up. The agreement rate between self-report and urine drug screen was 76.8%. Nineteen percent did not report illicit drug use but were found to be positive for urine drug screen, while 4.3% reported drug use but were negative for urine test.

Depression at 48-month follow-up was measured by the 20-item Center for Epidemiological Studies-Depression Scale (CES-D).²² The CES-D assesses the frequency and severity of depressed mood, hopelessness, sadness, crying spells, and alterations in sleep and appetite patterns. Each item is scored on a four-point Likert scale from 0 "rarely or none of the time (less than one day)" to 3 "most or all of the time (five to seven days)." Scores are added and can be 0-60; scores ≥ 16 indicate clinical depression. The scale has consistently demonstrated high reliability and evidence of construct validity across different populations.^{23,24}

Quality of life (QOL) was measured by the Hypertension Battery of Scales-Reduced Version,²⁵ which was designed to assess health-related QOL in hypertensive patients. It includes scales measuring each of seven health concepts: 1) general health perception (global QOL) (1 item); 2) psychological general wellbeing (11 items); 3) social functions (2

Table 1.	Description	of the sam	ple and ma	jor study	y variables	(N=210)
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Variable	Percent (%)	Mean (SD)
Age		45.7 (5.6)
Less than 40 years	15.7	
40–49 years	57.2	
50 years +	27.1	
Less than high school education	39.0	11.6 (5.4) years
Employed		
Full-time	31.4	
Part-time	7.6	
Annual income		
<\$10,000	58.1	
≥\$10,000	41.9	
Jail experience	61.9	
Cumulative stressful events		12.54 (6.71)
Depression		10.93 (9.53)
QOL		232.31 (27.89)

items); 4) sleep disturbance (2 items); 5) sexual function (4 items); 6) cognitive function (1 item); and 7) symptom bother (33 items). Global QOL is measured with a single question, "In general, how would you say that you have felt during the past 4 weeks," with five response categories from "excellent" to "poor." Higher scores of each domain indicate higher levels of quality of life except for sleep disturbance, cognitive function, and symptom bother, in which higher scores indicate poorer QOL in the respective areas. Hence, when total QOL scores were calculated for multiple regression analysis, we used reversed scores for the three domains indicated above, so that subscale scores would be in a consistent direction; higher total scores represent higher levels of QOL. Evidence of internal consistency reliability, test-retest reliability, and construct validity were provided.25

Analyses

Descriptive statistics and frequencies were computed to present demographic characteristics of the sample and to identify stressful life events that were most frequently experienced. A series of Pearson product moment correlation coefficients were computed to examine zero-order associations in the data. We then used hierarchical multiple regression to examine the hypothesis that stressful life events would be associated with negative health outcomes such as substance use, depression, and poor QOL at 48-month follow-up. Because we hypothesized that stressful life events would have an additive effect on health outcomes, as shown in a number of previous studies,^{11,12} we used cumulative scores of the life event measure (from 6-month to 48-month) when calculating correlation coefficients. Cumulative life events scores were obtained by summing the number of life events experienced at 6-month points over 48 months. After listwise deletion, 210 men (114 in MI and 96 in LI groups) were included in the analysis.

RESULTS

Description of the 210 men in the final sample and major study variables are shown in Table 1. No differences were seen in sociodemographic characteristics between the MI and LI groups.

Table 2 shows the 15 most frequently reported life events. Death of family member or close friend was the

most common and repeatedly experienced life event across eight measurement points, with almost two thirds (65.2%) of the men describing this event two or more times during the 48month period. Other types of stressors that were reported as occurring at more than two of eight measurement time points included having a new family member (32.9%), change in residence (31.4%), difficulty finding a job (24.3%), fired or laid off from work (17.6%), major change in the health or behavior of a family member or close friend (16.7%), and new, close personal relationship (16.7%). One third (33.3%) of the men reported involvements in a variety of crime or legal matters (ie, major/minor violation of the law, being a violence victim, or being in legal trouble resulting in being arrested or held in jail) at least twice in the past 48 months.

The men had an average of 1.57 stressful life events at each six-month point. When cumulative life events were calculated by adding number of stressful life events experienced from 6- to 48-month follow-up points, men reported an average of 12.54 stressful life events (SD=6.71, range 2-42). No significant difference was seen between MI and LI groups in the mean number of cumulative life events reported over time.

The sample was at high risk for substance use; almost half (45.7%) selfreported using drugs or tested positive on urine screening at the 48-month time period. In addition, of those who reported drinking beer during the past 30 days (n=103), 43.9% drank ≥ 5 drinks per day, an indicator of high-risk drinking that might result in psychomotor impairment.²⁶ A relatively small proportion of men (15.2%) reported drinking wine, but almost one third (31.2%) who drank wine reported having ≥ 5 drinks per day. More than a quarter of men (n=58) also reported drinking hard liquor in the past 30 days and almost half (48.3%) self-reported drinking ≥5 drinks per day. No

Item	6-month %	12-month %	18-month %	24-month %	30-month %	36-month %	42-month %	48-month %	Total [*]
Death of family member	202	29.7	29.7	24.9	20.0	22.0	20.0	24.0	65.2
or close friend	20.3	20.7	20.7	54.0	29.9	23.0	29.9	54.0	05.2
Gained a new family member	12.2	9.6	14.3	14.8	9.7	9.9	8.8	5.7	32.9
Changed residence	13.0	18.3	11.7	21.3	13.5	14.9	11.3	22.9	31.4
Difficulty finding a job	20.0	16.5	18.7	7.4	7.7	6.4	6.9	17.6	24.3
Been fired or laid off from work	n 13.0	11.7	15.2	7.8	7.7	4.5	6.9	9.0	17.6
Began a new relationship	10.4	13.0	13.9	11.7	3.2	4.5	3.9	14.3	16.7
Major change in the health or behavior of a family member or close friend	9.1	8.3	2.2	5.7	8.4	10.9	11.3	18.6	16.7
A major change in living conditions	9.6	7.8	2.2	6.5	7.1	3.5	2.5	16.7	11.0
Separated from one's spouse or partner	5.7	5.7	3.9	5.7	9.0	4.5	5.9	13.8	10.5
In legal trouble resulting in one being arrested or held in jail	7.4 r	7.8	3.0	7.0	1.9	3.5	4.4	9.0	9.0
Changed to a new type of work	f 7.4	6.5	2.2	2.6	1.3	4.0	2.5	9.0	8.6
Involved in a major/minor violation of the law	r 7.8	7.4	2.2	7.0	1.9	4.0	2.9	6.7	7.6
Accident	7.4	4.3	2.6	4.8	0.6	3.0	2.0	8.1	6.2
Being a violent victim	7.4	5.2	0.4	8.7	0.6	1.5	2.5	5.2	4.8
AIDS diagnosis	7.0	5.7	6.1	0.9	0.6	-	-	1.4	4.8
Involved in a major/minor violation of the law Accident Being a violent victim AIDS diagnosis	r 7.8 7.4 7.4 7.0	7.4 4.3 5.2 5.7	2.2 2.6 0.4 6.1	7.0 4.8 8.7 0.9	1.9 0.6 0.6 0.6	4.0 3.0 1.5 -	2.9 2.0 2.5 -	6.7 8.1 5.2 1.4	7.6 6.2 4.8 4.8

Table 2. Top 15 life events experienced by the sample (N=210)

Life events occurred two or more times during a total of eight measurement points

significant group difference was noted in substance use.

More than one fourth (26.7%) of the sample had CES-D scores ≥ 16 at 48 months of follow-up (mean 10.93, SD 9.53), which suggests clinical depression. While most men (71.6%) rated their global QOL as neutral or less (ie, ≤ 3 on a 1–5 scale), the mean item scores for six other QOL domains indicated greater than medium level of QOL across the domains (Table 3).

The association between demographic variables (age and education level), intervention status (ie, MI vs LI), depression, and QOL was examined by using correlation analyses. Only intervention status was significantly associated with depression (r=-.139, P=.04) and QOL (r=.146, P=.03) at 48 months. We did not include other demographic variables in Table 1 (ie, employment status, income, jail experience) since these variables were already part of the stressful life events checklist. Intervention status was entered first in subsequent regression analyses to examine the association between cumulative stress and depression and QOL.

Initial analyses were conducted to determine whether simple correlations between proposed independent and dependent variables were statistically significant. The bivariate correlations were partially consistent with the proposed hypothesis. Specifically, significant correlations of cumulative stressful life events were found with depression (r=0.224, P=.001) and with total QOL scores (r = -.221, P = .001) at 48 months. No significant association was found between stressful life events and substance use. Therefore, alcohol and illicit drug use as dependent variables were excluded in the next step of the analysis. The proposed hypothesis was tested by using hierarchical multiple regression analyses, controlling for intervention status. As shown in Table 4, after controlling for the effect of intervention status, cumulative stressful life events predicted greater depression

Table 3.	Descriptive	statistics	for	quality	of	life (QOL)
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QOL Domains	Possible Item Range	Item Mean (SD)
Global QOL	1–5	3.08 (1.03)
Psychological general well-being	1–6	4.72 (0.84)
Social functions	1–5	4.08 (1.01)
Sleep disturbance	1–6	2.19 (1.50)
Sexual function	1–5	2.78 (0.96)
Cognitive function	1–4	1.32 (0.60)
Symptom bother	1–4	1.29 (0.46)

Table 4. Multiple regression analyses that predict depression and QOL at 48 months

Predictor Variable	F Value for Equation	ΔR^2	В	SE	β
Predicting depression					
Step 1: Intervention status	4.11*	0.02	-2.66	1.31	-0.14*
Step 2: Cumulative stressful life events	7.19‡	0.05	0.30	0.09	0.21†
Predicting QOL					
Step 1: Intervention status	4.55*	0.02	8.17	3.83	0.15*
Step 2: Cumulative stressful life events	7.26‡	0.05	-0.88	0.28	-0.21^{+}
Statistically significant at * $P \le .05$; † $P \le .01$;	‡ <i>P</i> ≤.001.				

 $(\beta = .214, P=.002)$ and poorer QOL $(\beta = .211, P=.002)$ at 48 months. These variables together accounted for 7% of variances in depression and QOL, respectively.

DISCUSSION

The findings indicate that young Black men with HBP living in innercity Baltimore experienced multiple stressful life events whose cumulative effect significantly predicted increased depression and poor QOL. These findings are similar to reports in previous studies, which have supported an association between stressful life events and poor psychosocial outcomes of depression^{6,7,27} and QOL.¹⁷ However, none of these studies examined the relationships with a prospective study design or a sample of hypertensive patients.

We previously reported the adverse effect of depression on adherence to HBP treatment recommendations, including medication-taking and low-salt diet, among urban young Black men.²⁸ The findings in this analysis of stressful life events suggest that future interventions for young Black men with HBP should focus on assisting individuals in managing distress related to stressful events and provide them with necessary skills (eg, education on financial management skills) and community resources (eg, access to depression therapy). Tangible support for coping with stressful life events and depression may increase patients' compliance with their long-term HBP treatment and ultimately improve treatment outcomes.

In the literature, QOL in hypertensive patients has been studied mostly in regard to a certain antihypertensive pharmacologic treatment.^{29–32} The finding of cumulative stressful life events influencing QOL suggests the need to assess stressful life events early and continuously during treatment to help elucidate the relationships of HBP therapy and patient-reported QOL.

Whereas we expected that stressful events would have a significant effect on substance use, no association was found between these variables. Our results are inconsistent with prior studies,^{4,5,33} that reported a significant role for stressful events in substance use. Accurately interpreting this finding requires considering several contextual factors. First, most study participants reported using illicit substances at the time of the study (almost half using illicit drugs and drinking ≥ 5 drinks per day), which vielded little variance on this variable to make a statistically significant association with other variables. Second, a significant number of study participants were exposed to combined burdens of poverty and a stressful living environment with poor housing, frequent moving, and a high rate of crime (Tables 1 and 2). Therefore, the combination of these factors may have diminished statistical power to capture the underlying relationship between The findings in this analysis of stressful life events suggest that future interventions for young Black men with HBP should focus on assisting individuals in managing distress related to stressful events and provide them with necessary skills ... and community resources ...

stressful events and substance use in this population.

Potential measurement error may also have influenced the finding of the absence of a statistically significant association between stressful life events and substance use. Researchers have used two main approaches to assess stressful life events: checklists of predetermined events on which respondents indicate which events they have experienced7,11,12,14 and the open interview procedure in which respondents generate their own events.³⁴ The 23item stressful life events inventory used in this analysis was developed by the research team for this study. By administering a simple checklist instead of scaled items, we intended to reduce subject burden. In addition, instead of choosing an open response format we presented our participants with a set of questions that otherwise might not have been reported because of social desirability. While we successfully captured certain events uniquely experienced by this sample of hypertensive, young, Black men (eg, drug overdose, gunshot wound, AIDS diagnosis, or diagnosis of renal failure) and reduced subject burden, limiting their response to 0 or 1 without rating the effect could have insufficiently measured the level of stress caused by these events and obscured any existing effect of the stressful events in substance use.

In light of these considerations, the limitations of this study need to be noted. First, because of the characteristics of our sample, the results of this study should not be generalized beyond populations similar to our sample, a group of hypertensive, young, Black men living in an impoverished and highly stressful urban environment. Second, data are based on retrospective recall and self-report of stressful life events during the prior 6 months at each measurement point. While we could not control for inaccurate recall associated with self-report, we did attempt to enhance reliability of our assessment by having one data collector responsible for following a specific group of participants and conducting the assessment every six months rather than only at the annual research clinic visit.

Taken together, these data provide prospective evidence that stressful life events may place young, Black men with HBP at greater risk for depression and poor QOL. The findings of the study suggest that more attention should be paid to the behavioral and psychosocial aspects of HBP care, particularly in young Black men, for whom available resources are often limited. Further research is needed to determine if psychological interventions (eg, cognitive behavioral stress management) can modify the effects of stressful events, thereby altering the outcomes of HBP care and control.

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AUTHOR CONTRIBUTIONS

- Design and concept of study: Han, Kim, Rose, Dennison, Bone, Hill
- Acquisition of data: Han, Kim, Rose, Dennison, Bone, Hill

Data analysis and interpretation: Han, Kim, Rose, Dennison, Bone, Hill

- Manuscript draft: Han, Kim, Rose, Dennison, Bone, Hill
- Statistical expertise: Han, Kim, Rose, Dennison, Bone, Hill
- Acquisition of funding: Han, Kim, Rose, Dennison, Bone, Hill
- Administrative, technical, or material assistance: Han, Kim, Rose, Dennison, Bone, Hill
- Supervision: Han, Kim, Rose, Dennison, Bone, Hill