Original Article

Association Between Perceived Life Chaos and Medication Adherence in a Postmyocardial Infarction Population

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Background—The benefits of medication adherence to control cardiovascular disease (CVD) are well defined, yet multiple studies have identified poor adherence. The influence of life chaos on medication adherence is unknown. Because this is a novel application of an instrument, our preliminary objective was to understand patient factors associated with chaos. The main objective was to evaluate the extent to which an instrument designed to measure life chaos is associated with CVD-medication nonadherence.

Methods and Results—Using baseline data from an ongoing randomized trial to improve postmyocardial infarction (MI) management, multivariable logistic regression identified the association between life chaos and CVD-medication nonadherence. Patients had hypertension and a myocardial infarction in the past 3 years (n=406). Nearly 43% reported CVD-medication nonadherence in the past month. In simple linear regression, the following were associated with higher life chaos: medication nonadherence (β=1.86; 95% confidence interval [CI], 0.96–2.76), female sex (β=1.22; 95% CI [0.22–2.24]), minority race (β=1.72; 95% CI [0.78–2.66]), having less than high school education (β=2.05; 95% CI [0.71–3.39]), low health literacy (β=2.06; 95% CI [0.86–3.26]), and inadequate financial status (β=1.93; 95% CI [0.87–3.00]). Being married (β=−2.09, 95% CI [−3.03 to −1.15]) was associated with lower life chaos. As chaos quartile increased, patients exhibited more nonadherence. In logistic regression, adjusting for sex, race, marital status, employment, education, health literacy, and financial status, a 1-unit life chaos increase was associated with a 7% increase (odds ratio, 1.07; 95% CI [1.02–1.12]) in odds of reporting medication nonadherence.

Conclusions—Our results suggest that life chaos may be an important determinant of medication adherence. Life chaos screenings could identify those at risk for nonadherence.

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Key Words: cardiovascular diseases ■ medication adherence ■ myocardial infarction

The benefits of medication adherence to control cardiovascular disease (CVD) are well documented; however, ≥50% of patients report failing to take their medications for CVD and CVD risk factors as prescribed.[1] Medication nonadherence has the potential to worsen CVD outcomes as the general population ages.[2] Reasons for medication nonadherence in CVD risk reduction are often multifactorial and include health system factors (eg, poor patient–provider communication, lack of access), comorbid health conditions (eg, depression, asymptomatic conditions), patient factors (eg, cognitive impairment), therapy (eg, side effects), and socioeconomic characteristics (eg, low literacy, cost, race).[2–10] Recognizing and modifying barriers to proper medication adherence is a critical first step to improving rates of adherence in patients with CVD.

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One understudied factor potentially impacting CVD-related medication nonadherence is a chaotic lifestyle and environment, also known as life chaos. Life chaos encompasses a multitude of factors and includes variability in daily routine, ability to plan and anticipate the future, and punctuality. It also includes the ability to maintain financial stability, employment, housing, and to maintain appointments. Life chaos has been associated with decreased healthcare use among patients with chronic diseases.[11,12] As a result, life chaos may be an important barrier to prescription medication adherence.

To date, we are not aware of any known studies examining the potential impact of life chaos on CVD-related medication adherence. Therefore, in a cohort of patients with established CVD and hypertension, we had 2 objectives. Because life chaos is a novel concept in this context, our preliminary objective was to understand patient-level factors associated

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WHAT IS KNOWN

- The benefits of medication adherence to control cardiovascular disease are well documented, yet adherence remains substandard.
- Reasons for non-adherence are multifactorial, including both healthcare system and patient level factors.

WHAT THE STUDY ADDS

- Among postmyocardial infarction patients, this population self-reported a relatively high degree of life chaos.
- Our results suggest that life chaos may be an important determinant of medication adherence.
- Screening for life chaos could identify those at risk for medication non-adherence.

with life chaos. This objective is an important precursor to identifying relevant factors for inclusion in the multivariable model. Understanding the association between life chaos and medication nonadherence at a snapshot in time is of critical clinical importance because it provides a potential opportunity for intervention at the time a person is being seen by a care provider. As our main objective, we sought to evaluate the extent to which an instrument designed to measure current life chaos would be associated with current CVD-medication nonadherence after adjusting for sociodemographic factors.

Methods

Data Source

Cross-sectional data were obtained from the Secondary Prevention Risk Interventions via Telemedicine and Tailored Patient Education (SPRITE) study, an ongoing randomized trial to improve postmyocardial infarction (MI) management. The methods of the SPRITE study have been previously described in detail.[13] In brief, SPRITE (n=406) was a 3-arm randomized, controlled trial using novel electronic approaches to facilitate self-management of lifestyle and behavior modification for hypertension and other CVD risk factors. These tools were Heart360, a Web-based interaction communication tool developed by the American Heart Association for recording and sharing home blood pressure (BP) results with care providers and HealthVault, Microsoft's electronic health record platform. Patients with a history of MI <3 years who also had diagnosed hypertension at the time of enrollment were included in the study. Patients were randomized to 1 of 3 study arms: (1) home BP monitoring using Heart 360 plus a nurse-delivered, telephone-based tailored patient education intervention; (2) home BP monitoring using Heart 360 plus a tailored, Web-based patient education intervention; or (3) standard care. Patients in the intervention arms were either instructed to use their existing home BP monitor or were issued one by the study team (Omrom HEM 790-IT). This analysis exclusively used baseline data from the surveys completed at the time of study enrollment. Data obtained at baseline included demographic characteristics, clinical values (eg, BP), and information about life chaos, among others. This study was approved by the Duke University Institutional Review Board (http://www.clinicaltrials.gov; unique identifier NCT00901277).

Outcome Measure: Self-Reported Medication Nonadherence

The primary outcome of medication adherence was evaluated using a validated 4-item self-reported measure developed by Morisky, which has predictive validity for biological outcomes.[14–16] The Morisky medication adherence scale is a commonly used and quick screening tool to detect issues with taking medications as prescribed. Participants were presented with 4 statements about CVD-medication–taking behaviors and were asked to indicate whether the statements were true for them during the past 30 days. The statements were: "I sometimes forget to take my medicine"; "I am sometimes careless about taking my medicine"; "when I feel better, I sometimes stop taking my medicine"; and "if I feel worse when I take the medicine, sometimes I stop taking it." Possible responses were a 4-point Likert scale ranging from "strongly agree" (1) to "strongly disagree" (4). Items were initially summed to create a scale and then, based on responses to the Morisky items, individuals were dichotomized into 1 of 2 groups. Consistent with previous research,[17] individuals were classified as nonadherent if they responded "strongly agree," "agree," "don't know," or "refused" for any of the 4 statements; otherwise patients were classified as adherent. If any of the 4 items were missing a response, then the nonadherence variable was also considered missing.

Primary Independent Variable: Life Chaos

The original Confusion, Hubbub, and Order Scale (CHAOS) was a 15-item scale designed to address consistency of daily routine, ability to plan, and anticipate future activities, and being on time. The scale was initially designed for administration to parents for assessing chaos in a child's home.[18] More recently, a 6-item scale has been validated for self-administration in an adult population with HIV.[11] Cronbach's alpha of 0.67 for the 6-item CHAOS scale has been previously reported.[11]

This 6-item scale was the measure of life chaos included in our survey and had the following items: "My life is organized"; "My life in unstable"; "My routine is the same from week to week"; "My daily activities from week to week are unpredictable"; "Keeping a schedule is difficult for me"; "I don't like to make appointments too far in advance because I don't know what might come up." Response choices were recorded on a 5-point Likert scale ranging from "definitely true" to "definitely false." Several questions were reverse coded (eg, all but the first and third items). Scoring of the CHAOS scale was performed by summing item responses (eg, 0-30), such that a higher score consistently indicated a more chaotic lifestyle.

Control Covariates: Sociodemographic Factors

Sex and Race

There are sex differences in use of antihypertensive prescription medications.[8] Sex (male versus female) was included in these analyses. There are also documented racial differences in adherence to cardiac medication.[3,4] Racial information was based on patients' self-reported race during the baseline survey. Possible response options included "white or Caucasian," "black or African American," "Asian," "American Indian/Alaska Native," "Native Hawaiian or Other Pacific Islander," as well as "other," "don't know," or "refused." The majority of participants reported either Caucasian or African American races. There were few participants of non–African American minority races. Therefore, the race variable included in multivariable regression is dichotomized (Caucasian versus minority race).

Marital Status

Marital status is a common proxy measure for social support. Married people tend to engage in healthier behaviors, including medication adherence, compared with those who are unmarried.[10] These analysis included a binary measure of marital status (married versus not married).

Employment Status and Educational Attainment

Being unemployed is a risk factor for nonadherence to antihypertensive medications.[9] Therefore, we included a binary measure of employment (used part- or full-time versus unemployed). Having less than a high school education has been associated with lack of understanding about optimal BP and medication nonadherence.[4,6] Therefore, a dichotomized measure of patient-reported educational

attainment was included in analysis (less than high school education versus high school or greater education).

Inadequate Financial Status

Previous research has shown an association between inadequate financial status and medication nonadherence.[3,6] Participants were asked to describe their household's current financial situation. Possible response options included: "After paying the bills, you still have enough money for special things that you want," "You have enough money to pay the bills, but little spare money to buy extra or special things," "You have money to pay the bills, but only because you have to cut back on things," or "You are having difficulty paying the bills no matter what you do." This measure was dichotomized such that participants who reported the latter 2 categories (eg, cutting back on things or difficulty paying bills) were considered to have inadequate financial status.

Low Health Literacy

There is evidence that low health literacy suggests poor medication adherence.[4] Health literacy was assessed using the Rapid Estimate of Adult literacy in Medicine (REALM) test.[19] REALM is a 66-item word recognition evaluation to provide a rapid appraisal of health literacy. Low health literacy was a dichotomous variable defined as a REALM score of up to and including eighth grade (≤60 score) versus ninth grade or higher (≥61 score).[20]

Statistical Analysis

Data were analyzed in Stata, version 12.1 (StataCorp, College Station, TX). Descriptive statistics were used to summarize baseline participant characteristics. Simple linear regression was used to identify patient-level factors associated with life chaos. We report the estimated beta coefficients (β) and 95% confidence intervals (CI), portraying the association between each factor and life chaos. To identify factors associated with CVD-medication nonadherence, we used multivariable logistic regression to estimate odds ratios (OR) and 95% CIs reflecting the likelihood of nonadherence based on the presence of a patient-level factor. The primary independent variable of interest was life chaos (continuous variable; summary score ranging 0–30). Covariates were selected a priori based on factors previously shown to impact medication nonadherence.[2–10] Interaction terms were considered (eg, life chaos*inadequate financial status; life chaos*white race), but none were significant or improved model fit. Multicollinearity was evaluated using the variance inflation factor and was not found to be a problem.

Results

Study Population

At the time of baseline enrollment ≈43% (n=174) of the sample reported some degree of nonadherence with their CVD prescription medications in the previous 30 days. The majority of participants were white (66%), married (66%), and male (72%). A minority of participants (13%) had completed <12 years of schooling (Table 1). Almost one quarter of participants reported inadequate financial status, and 17% had low health literacy. On average, patients' BP was in control (mean systolic 124.7 [±19.8] mm Hg; mean diastolic 75.2 [±11.5] mm Hg). A

Table 1. Participant Baseline Characteristics

	Adherent (n=232)	Nonadherent (n=174)	Total Cohort (N=406)
Demographic characteristics			
Mean age (SD)	62.7 (9.9)	58.1 (11.3)	61.2 (10.7)
Male	169 (73)	123 (71)	293 (72)
Race			
White or Caucasian	169 (73)	96 (55)	266 (66)
Black or African American	51 (22)	69 (40)	120 (30)
Other	12 (5)	8 (5)	20 (5)
Hispanic ethnicity	2 (1)	8 (5)	10 (2)
Married	161 (69)	105 (60)	266 (66)
Completed less than high school	23 (10)	30 (17)	53 (13)
Low health literacy	32 (14)	36 (21)	68 (17)
Used	86 (37)	63 (36)	149 (37)
Inadequate financial status	42 (18)	50 (29)	92 (23)
Clinical characteristics			
BP (mm Hg)			
Mean systolic BP (SD)	121.7 (17.4)	128.7 (22.1)	124.7 (19.8)
Mean diastolic BP (SD)	73.9 (10.9)	76.9 (12.1)	75.2 (11.5)
Mean HbA1c (SD)	6.5 (1.3)	6.8 (1.7)	6.6 (1.5)
LDL (SD)	89.4 (35.6)	104.9 (44.7)	96.4 (41.2)
Total cholesterol (SD)	155.9 (40.6)	170.6 (47.0)	162.5 (44.7)
Psychosocial characteristics			
Life chaos (SD)	13.6 (4.7)	15.5 (4.4)	14.5 (4.6)
Medication nonadherence	0 (0)	174 (100)	174 (43)

Confusion, Hubbub, and Order Scale (CHAOS) summary scores ranged from 0 to 30, with higher scores indicating more chaotic lifestyle. Summary score was not calculated for participants missing data for ≥1 CHAOS questions (n=5). Values are n (%). BP indicates blood pressure; HbA1c, glycated hemoglobin; and LDL, low-density lipoprotein.

Table 2. Life Chaos Survey Items

	Adherent (n=232)	Nonadherent (n=174)	Total Cohort (N=406)
My life is organized (n=404 [232 adherent, 172 nonadherent])			
Definitely true	69 (30)	32 (19)	101 (25)
Somewhat true	132 (57)	90 (52)	222 (55)
Unsure	5 (2)	15 (9)	20 (5)
Somewhat false	13 (6)	21 (12)	34 (8)
Definitely false	13 (6)	14 (8)	27 (7)
My life is unstable (n=404 [232 adherent, 172 nonadherent])			
Definitely true	7 (3)	9 (5)	16 (4)
Somewhat true	24 (10)	29 (17)	53 (13)
Unsure	8 (3)	16 (9)	24 (6)
Somewhat false	47 (20)	48 (28)	95 (23)
Definitely false	146 (63)	70 (41)	216 (54)
My routine is the same from week to week (n=404 [232 adherent, 172 nonadherent])			
Definitely true	58 (25)	43 (25)	101 (25)
Somewhat true	122 (53)	95 (55)	217 (54)
Unsure	2 (1)	2 (1)	4 (1)
Somewhat false	26 (11)	25 (15)	51 (13)
Definitely false	24 (10)	7 (4)	31 (8)
My daily activities from week to week are unpredictable (n=403 [231 adherent, 172 nonadherent])			
Definitely true	28 (12)	36 (21)	64 (16)
Somewhat true	83 (36)	63 (37)	146 (37)
Unsure	8 (3)	4 (2)	12 (3)
Somewhat false	63 (27)	42 (24)	105 (26)
Definitely false	49 (21)	27 (16)	76 (19)
Keeping a schedule is difficult for me (n=404 [232 adherent, 172 nonadherent])			
Definitely true	12 (5)	14 (8)	26 (6)
Somewhat true	40 (17)	45 (26)	85 (21)
Unsure	6 (3)	9 (5)	15 (4)
Somewhat false	66 (28)	57 (33)	123 (31)
Definitely false	108 (47)	47 (28)	155 (38)
I do not like to make appointments too far in advance because I do not know what might come up (n=402 [230 adherent, 172 nonadherent])			
Definitely true	38 (17)	41 (24)	79 (20)
Somewhat true	55 (24)	47 (27)	102 (26)
Unsure	5 (2)	4 (2)	9 (2)
Somewhat false	46 (20)	36 (21)	82 (20)
Definitely false	86 (37)	44 (26)	130 (32)

Values are n (%).

full description of the participants' demographic, clinical, and psychosocial characteristics are presented in Table 1.

Life Chaos

Internal consistency was high for the life chaos measures (Cronbach's alpha=0.92). The majority (80%) of participants reported that it was definitely or somewhat true that their life is organized (Table 2). Most participants (77%) reported that their life was stable. Nearly 80% of participants reported that their routine is the same from week to week. Over half (53%) of participants reported that their daily activities from week to week are unpredictable. A minority of participants (27%) reported that keeping a schedule was difficult for them.

Table 3. Simple Linear Regression Models Displaying Individual Characteristics Associated With Life Chaos

	β	95% CI
Medication nonadherence	1.86	0.96–2.76
Sociodemographic characteristics		
Female sex	1.22	0.22–2.24
Minority race	1.72	0.78–2.66
Married	−2.09	−3.03 to −1.15
Used	−0.76	−1.70 to 0.18
Less than high school education	2.05	0.71–3.39
Inadequate financial status	1.93	0.87–3.00
Low health literacy	2.06	0.86–3.26

Note that each row displays results from a separate, simple linear regression model. n=401 for most factors, with the exception of married (n=399) and inadequate financial status (n=390). β indicates beta coefficient; and CI, confidence interval.

Approximately 45% of participants reported, "I don't like to make appointments too far in advance because I don't know what might come up." Simple linear regression indicated that the following factors were associated with higher overall life chaos: medication nonadherence (β=1.86; 95% CI [0.96–2.76]), female sex (β=1.22; 95% CI [0.22–2.24]), minority race (β=1.72; 95% CI [0.78–2.66]), having less than high school education (β=2.05; 95% CI [0.71–3.39]), low health literacy (β=2.06; 95% CI [0.86–3.26]), and inadequate financial status (β=1.93; 95% CI [0.87–3.00]). Conversely, being married (β=−2.09; 95% CI [−3.03 to −1.15]) was associated with lower overall life chaos (Table 3). Furthermore, we examined differences in patient characteristics by life chaos quartiles (Table 4). As chaos quartile increases, a greater degree of medication nonadherence, increase in mean systolic and diastolic BP, and increase in mean glycated hemoglobin, low-density lipoprotein, and total cholesterol were identified.

Medication Adherence

Internal consistency was high for the Morisky medication adherence items (Cronbach's alpha=0.89), which were used to create the dichotomized outcome variable. In multivariable logistic regression, after adjusting for a priori covariates including sex, race, marital status, employment, education, health literacy, and financial status, a 1-unit increase in life chaos was associated with a 7% increase (OR 1.07; 95% CI [1.02–1.12]) in the odds of medication nonadherence (Table 5). Apart from life chaos, race was the only covariate with a statistically significant association with self-reported medication nonadherence. Compared with Caucasian patients, participants of minority races had ≈67% increased odds of medication nonadherence (OR 1.67; 1.06–2.63).

Discussion

In a cohort of patients with a previous history of MI and hypertension, we identified that almost one half of participants reported nonadherence to their CVD medications within the past 30 days. This adherence rate is consistent with existing literature examining CVD-medication adherence both generally and for those with previous MI.[1,21,22] Additionally, this population self-reported a relatively high degree of life chaos. After adjusting for other potential factors associated with medication nonadherence, life chaos was significantly associated with CVD-medication nonadherence. This finding

Table 4. Participant Baseline Characteristics by Life Chaos Quartiles

Life Chaos Quartiles	0–24.9% (n=88)	25–49.9% (n=98)	50–74.9% (n=107)	75% to 100% (n=109)
Medication nonadherence	26 (30)	37 (38)	49 (46)	61 (55)
Demographic characteristics				
Male	72 (82)	73 (74)	70 (65)	75 (68)
Minority race	16 (18)	28 (29)	47 (44)	48 (44)
Married	74 (84)	66 (67)	65 (61)	59 (54)
Completed less than high school	6 (7)	9 (9)	14 (13)	23 (21)
Low health literacy	7 (8)	11 (11)	18 (17)	31 (28)
Used	35 (40)	40 (41)	36 (34)	35 (32)
Inadequate financial status	14 (16)	21 (21)	24 (22)	33 (30)
Clinical characteristics				
BP (mm Hg)				
Mean systolic BP (SD)	122.7 (15.0)	123.4 (17.9)	126.6 (23.0)	124.9 (21.1)
Mean diastolic BP (SD)	75.0 (10.2)	74.5 (10.6)	75.4 (12.8)	75.6 (12.1)
Mean HbA1c (SD)	6.3 (0.9)	6.4 (1.1)	6.8 (1.6)	6.9 (1.9)
Mean LDL (SD)	88.8 (34.8)	93.3 (40.2)	93.3 (36.2)	107.1 (48.5)
Mean total cholesterol (SD)	156.8 (41.7)	157.7 (44.8)	160.9 (37.5)	172.0 (51.2)

Note: Because a small group of patients (n=4) were missing a life chaos measure, they are not included in this table. Therefore, across tables the totals differ slightly. Values are n (%). BP indicates blood pressure; and LDL, low-density lipoprotein.

Table 5. Multivariable Logistic Regression Model of Factors Associated With Medication Nonadherence (n=388)*

	OR	95% CI
Life chaos†	1.07	1.02–1.12
Sociodemographic characteristics		
Female sex	0.96	0.59–1.58
Minority race	1.67	1.06–2.63
Married	0.94	0.59–1.51
Employed	1.17	0.75–1.81
Less than high school education	1.34	0.68–2.62
Inadequate financial status	1.49	0.91–2.46
Low health literacy	0.95	0.37–2.47

C-statistic = 0.65. OR indicates odds ratio; and CI, confidence interval.

*The outcome variable is medication nonadherence, where nonadherence=1 and adherence=0.

†Life chaos is a continuous variable with possible scores ranging 0 to 30. A higher number indicates a greater degree of life chaos.

suggests that people with more chaotic lifestyles have difficulty managing their daily medication-taking routine.

Our results suggest that life chaos may be an important determinant of health and behaviors such as medication adherence. Our findings of medication nonadherence among patients with established CVD and hypertension are similar to previous results found among patients with HIV who reported life chaos. Among adults living with HIV, life chaos has been associated with poor mental health status, higher emergency department use, and missed outpatient clinic appointments.[11] Moreover, it has been suggested that the physical environment (eg, noise, traffic, and overcrowding) may impact life chaos and, subsequently, health and hypertension.[23,24] However, there is still limited research evaluating the effects of chaos on health. Given the array of sociodemographic characteristics in the model, it is noteworthy that, beyond race, life chaos was the only remaining variable related to self-reported medication adherence. Future studies are needed to quantify which elements of a chaotic lifestyle make medication adherence challenging. For example, is variability in daily routine, organizational skills, or another factor(s) most contributing to a chaotic lifestyle and medication nonadherence? Additionally, the clinical impact of a small change in life chaos (eg, 1-unit change in the summary scale) needs to be further examined. This information could inform threshold levels of chaos to dictate when intervention (eg, stress management or organizational training) is warranted.

Our study focused on the association between life chaos and medication adherence while adjusting for other potentially confounding factors. Although not statistically significant in multivariable regression, it is important to note that life chaos may be interlaced with sociodemographic factors such as employment status. In simple linear regression analysis, when examining the overall summary life chaos score, marital status (a proxy measure for social support) was negatively associated with life chaos. Low health literacy, inadequate financial status, lower educational attainment, female sex, minority race, and medication nonadherence were all associated with greater life chaos. When examining baseline participant characteristics by life chaos quartiles, we discovered that as chaos quartile increases, participants exhibited poorer self-management as evidenced by more medication nonadherence, worse BP, HbA1c, and cholesterol values. Many of these factors are interrelated. For example, people with a high degree of life chaos might be unable to complete a higher education and, conversely, people without a higher education might have less control over their lives and experience a higher degree of life chaos. This possible endogenous relationship should be hypothesis generating and an area worthy of future research. While evaluating different disease states and outcomes (medication adherence versus healthcare use), these results are somewhat consistent with information in the HIV literature by Wong et al.[11] In the context of HIV, a greater degree of social support was associated with lower reported life chaos. However, level of life chaos did not vary by race, income, or education.[11] The differences in results may be because of differences in the disease states (MI and hypertension versus HIV), the environment of the studies (Durham, NC versus Los Angeles, CA), recruitment strategies (clinic-based recruitment versus mobile outreach targeting streets and shelters), or other study design differences.

This study is limited in that it only looked at the baseline association between chaos, demographic factors, and self-reported medication adherence. A future predictive analysis may provide additional information as to the effects that life chaos may have on health outcomes with time. For example, this population had a history of MI. It would be interesting to note whether life chaos varies immediately after a sentinel health event and diagnosis, and how changes in life chaos with time affect medication adherence. Furthermore, it would be beneficial to measure life chaos longitudinally with time among cohorts of individuals to understand both how it changes with time and subgroups of populations whereby life chaos is more likely to appear. Because chaos is a time-varying construct, chaos may be acute immediately after a cardiac event but may gradually diminish with time. This observation could be evaluated further using a prospective study design. Finally, using an objective measure of medication adherence, such as pharmacy refill data, could add precision to future studies. This assessment would help to target and develop interventions where chaos may need to be acted on and assessed.

Practice Implications

To our knowledge, this is the first study that has examined life chaos and medication adherence among a population with a history of MI and hypertension. Life chaos seems to be an important factor in understanding medication nonadherence. The existing life chaos scale is succinct and quick to administer. Evaluating life chaos at the point of care may prove to be a useful screening test for potential nonadherence. Moreover, life chaos may be a modifiable determinant of medication nonadherence. Teaching patients about how to manage life chaos and daily routines may alleviate an important barrier for medication nonadherence, improving future interventions and health outcomes. Thus, patients identified as having high life chaos may benefit from referral to social work, therapy, or other community-based services such as life skills classes.

In conclusion, life chaos is significantly associated with medication nonadherence among patients with CVD and hypertension. Future research should examine if tailored and targeted interventions administered to patients with high levels of life chaos can improve medication nonadherence. The degree to which technology could provide reminders and assistance in self-monitoring should also be examined as they could improve outcomes in patients with CVD.

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Disclosures

S.C. Grambow reported that he currently receives consulting fees from Gilead Sciences for serving on multiple Data and Safety Monitoring Boards (DSMBs). Although the relationship is not perceived to represent a conflict with the present work, it has been included in the spirit of full disclosure.

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