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Detecting and Addressing Trauma-Related Sequelae in Primary Care

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After studying this article, you should be able to:

- Implement trauma-informed practices

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ABSTRACT

Objective: The associations between the sequelae of complex trauma symptoms and adult health status, patient engagement in treatment, and the potential impacts on primary care providers are underappreciated despite the potential for adverse outcomes. This study examined the correlations among adult primary care patients' reports of posttraumatic stress symptoms (PTSS), adverse childhood experiences (ACE), and the impacts of social determinants of health (SDH) with provider diagnoses in the electronic health record.

Methods: Patients in 3 primary care clinics were surveyed. Self-report measures included demographics, trauma symptoms, ACE, and SDH elements. Participant health status and diagnoses were obtained from their electronic health records.

Results: The final sample of 354 participants reported high levels of trauma including PTSS and ACE. Educational attainment, health literacy, material hardship, access to health care, and ACE were all statistically associated with reports of PTSS ($P < .05$ for all). Despite the prevalence of symptoms and adverse experiences reported by the participants, only 5% were diagnosed with a trauma-related disorder in the electronic health record.

Conclusions: Data analyses revealed a significant discrepancy between participants' reports of symptoms with a diagnosis of posttraumatic stress disorder by their primary care doctor. Trauma-impacted patients often present with complicated health problems that may influence the encounter in negative ways, including diminishing the primary care doctor's sense of efficacy and competency if they are not addressed effectively in the encounter. The common nature of ACE, PTSS, and SDH effects indicate that both patients and physicians would benefit from detection and training in strategies for routinely implementing trauma-informed practices.

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The US health care system needs significant change to address rising health care costs while also improving patient health outcomes. Some researchers predict up to 49% of Americans will suffer from chronic health conditions (defined as incurable illnesses or conditions) by 2025.¹ Patients with chronic health problems are high utilizers of health care services and account for a large portion of health spending in the United States.² Adverse childhood experiences (ACE) and other childhood traumas have negative health impacts on patients' neurologic,

Clinical Points

- Identification of effective primary care trauma-informed approaches that address the effects of posttraumatic stress symptoms will advance medical treatment of adults who are most at risk for chronic health conditions and the prevalent adverse childhood experience sequelae including chronic, complex trauma symptoms.
- Successful trauma-informed primary care practices should acknowledge social determinants of health and patients' experiences of trauma including impacts of adverse childhood experiences in to provide effective health care services that both facilitate and inspire patients' sense of safety and trust.

physical, and psychological development, which translate to poor overall health and functioning in adulthood.³⁻⁵ Complex trauma and interrelated patient factors lead to increased medical health care utilization.⁶⁻⁸

Associations Between Trauma-related Disorders and Adverse Childhood Experiences

Traumas of any kind can lead to negative health consequences.⁹ While exposure to a traumatic experience elicits an acute distress reaction or posttraumatic stress symptoms (PTSS) in most individuals, not all individuals will go on to develop a diagnosis of posttraumatic stress disorder (PTSD). A diagnosis of PTSD is made when the constellation of trauma symptoms persist beyond 1 month of the exposure and these symptoms impact the individual's functioning.¹⁰ Some individuals experience symptoms of PTSD that are disabling, but their symptoms are subthreshold, meaning there are not enough symptoms to meet criteria for a diagnosis of PTSD.^{11,12} Nevertheless, these individuals are suffering with PTSS and chronic, complex trauma sequelae.^{13,14} Complex PTSD is typically related to a series of events or 1 prolonged event, while PTSD may be diagnosed after 1 event or experience.¹⁵ The symptoms of complex PTSD can be more enduring and extreme than those of PTSD, and a clinician may diagnose complex PTSD when a patient has experienced trauma on an ongoing basis.^{11,12,16} The *International Classification of Diseases* identifies complex PTSD as a separate condition, although the *DSM-5* does not.^{13,17} There are several factors that create a higher risk for developing PTSS or trauma-related illness like PTSD including previous traumatic experiences such as ACE.^{18,19} Moreover, individuals who experience early trauma like ACE are more likely to be retraumatized, leading to a greater risk for later developing mental illnesses and PTSS in adulthood.²⁰⁻²⁴

Trauma-related disorders and PTSS are complex, intense, protracted reactions to various trauma experiences. The biological manifestations of ACE in children and adolescents closely resemble those of patients suffering with traumatic stressors in adulthood.^{25,26} Evidence regarding the etiology for PTSS and trauma-related diagnoses supports the hypotheses that patient illness and distress arise from

an amplified activation of almost every biological system employed for coping, adaptation, and survival.⁵ Unrelenting, high levels of stress coupled with an individual's inability to discern perceived threat from real threat leads to persistent alerts, which are the potential precursors to vulnerability to medical illness in adulthood.²⁰ Adults who experienced ACE are more apt to experience PTSS and trauma-related disorders because of the preexisting sensitization arising from the disruption of the hypothalamic-pituitary-adrenal axis.^{24,27}

ACE is a well-recognized construct of childhood adversity originally defined by Felitti and colleagues^{3,4} as experiences of childhood physical, emotional, or sexual abuse; neglect and material hardship; and various types of household dysfunction such as witnessing violence toward the mother, parental separation or divorce, household occurrences of substance abuse issues, parental mental illness, or incarceration. Exposure to any ACE category is counted equally as 1 point, with points totaled for a final adversity score out of a possible score of 10. Adults with high ACE scores (defined as ≥ 4) have a higher risk for chronic poor health and struggles with higher level brain functions such as impulse control, planning, flexible decision-making, emotional regulation, or the ability to focus attention because of the impact of trauma on their brain development.^{28,29} Numerous studies^{5,30,31} have found that, for individuals with high ACEs, there are complex interactions between biological processes and social determinants of health (SDH) with strong evidence for linkages to brain dysfunction and chronic illness in adulthood. These struggles are posited to be the result of specific elevated neurotransmitters and fluctuating levels of stress hormones that negatively influence brain structure and functioning.^{24,32}

Posttraumatic Stress Symptoms, Complex Trauma, and Health Care Complexity in Primary Care Settings

A shortage of mental health providers along with the stigma of seeking specialty treatment for mental health illnesses influence where patients seek care.³³ Primary care settings are where many patients initially present for evaluation and treatment.³⁴ Although family medicine physicians receive a limited behavioral health curriculum component as part of their residency training, internal medicine residents do not have this requirement.³⁵ Due to this relative dearth of specialized instruction for treating complicated mental health issues related to complex trauma, PTSD, and PTSS, many primary care providers miss detecting and discussing patients' trauma symptoms and concerns.^{36,37}

ACE results in long-term negative health consequences for adults, yet comprehensive strategies to reduce ACE are in their infancy. Unfortunately, individuals who experience high levels of ACE and PTSS also struggle with poor engagement with primary care health providers, lower health literacy, increased health-risk behaviors, and high medical utilization rates at the most expensive care sites such as emergency care centers.^{1,2} The lack of trauma-informed practices may lead

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to insensitive physician reactions to patient disclosures of past or present trauma. Unsympathetic reactions by medical providers increase the severity of PTSS, confirmed in studies of disclosures of sexual assault.^{38,39} Unaddressed ACE after effects, insensitive responses to disclosures of abuse and violence, and unaddressed PTSS have costly effects on an individual's ability to function in day-to-day relationships and important endeavors.⁴⁰ A central component of trauma-informed practice is to seek to prevent the retraumatization of patients.

Adults who experienced high levels of early adversity often present challenges for providers in the primary care settings wherein they most often seek treatment.^{6,8} Primary care physicians face multiple competing demands during the ambulatory encounter—a situation magnified in practices in which the population may be at high risk for trauma and who concurrently experience other sources of adversity such as socioeconomic vulnerability. Studies of medical records found that primary care physicians often fail to uncover PTSD diagnoses or develop treatment plans to address PTSS for their patients.⁴¹ Further elucidation of the association between trauma symptomatology, ACE, and SDH in vulnerable primary care populations is warranted to inform the clinical impact of caring for patients with trauma sequelae.

METHODS

Description

This cross-sectional study was conducted at the University of Oklahoma School of Community Medicine internal medicine, family medicine, and community health clinics. The community health clinic is a faculty-supervised student-run clinic for the uninsured or underinsured. The study was approved by the university's institutional review board. Written consent was obtained, and a \$10 gift card was provided for participation. Inclusion criteria included being aged ≥ 18 years and currently enrolled in one of the identified primary care clinics. Participants completed the questionnaire individually, or a member of the research team interviewed the participant and recorded the responses if needed. The questionnaire and interviews were available in Spanish. On average, participation took 20–30 minutes. The data were collected from participants in June through August 2012.

Data were entered and cross-checked for accuracy. Duplicates or respondents who did not fit the inclusion criteria were omitted from the final sample. The final sample included 354 clinic patients from internal medicine ($n = 173$), family medicine ($n = 116$), and community health ($n = 60$).

Study Measures

The survey assessed demographic factors such as age, sex, ethnicity, education, and health literacy, as well as potential sources of adversity including health care barriers, social support, community problems, material hardship, and food insecurity (Table 1). Measures of support or adversity and

health literacy were assessed through rating confidence in completing medical forms.⁴² Material hardships were measured using an adapted form of the Survey of Income and Program Participation⁴³ intended to measure the extent of severity in households experiencing physical hardship. Health care barriers were assessed with questions about having a regular primary care provider or lack of access to health care due to financial or insurance constraints. Social support was measured using the emotional support scale of the Medical Outcomes Study 36-item Short-form Health Survey,⁴⁴ with higher scores indicating higher social support. Community problems measured participants' perceptions of adversity in the communities in which they reside, such as vandalism, crime, and abandoned homes. History of intimate partner violence was assessed by questions about ever experiencing in a relationship physical aggression (eg, slapped, kicked, choked), forced or coerced sex, threat by gun or knife, feeling afraid of physical injury, feeling frightened by verbal aggression (eg, screaming), and other verbal harm (eg, threats, put downs). ACE scores were obtained from the ACE questionnaire responses based on the 10 items cited by the seminal ACE study.³ PTSS was measured using the Primary Care PTSD (PC-PTSD) screen.⁴⁵ Participants' electronic health records were reviewed for medical history and diagnoses by a physician blinded to the participants' ACE and adversity status.

Analysis

A series of χ^2 tests of independence was conducted to examine the relationships between levels of ACE reported (0–1, 2–3, 4 or more) with PTSS. A hierarchical multiple regression analysis of participants' PC-PTSD scores as the dependent variable was conducted to examine the extent to which ACE and other concurrent SDH were associated with PTSS. A hierarchical regression model was used. At the first step of the model, demographic variables and other measures of SDH were included; at the second step, experience of intimate partner violence was included; and the final step included ACE.

RESULTS

The majority of participants had a high school education or less (68%), were White (65%), were > 36 years of age (67%), and were female (75%). Specific demographic results from these data are reported in Table 1.⁴⁶

Participants reported experiences of adverse SDH such as high levels of community struggles, housing problems, food insecurity, barriers to health care, low levels of health literacy, and material hardship in the previous 12 months (Table 2). The mean ACE score was 3.15, with respondents reporting significant PTSD symptoms including nightmares, avoidance, hypervigilance, and numbing (Table 3). Respondents who reported PTSS of numbness or detachment, hypervigilance, nightmares, and avoidance had statistically higher ACE scores. Over one-half of the sample reported 1 or more symptoms of PTSS on the PC-PTSD

Table 1. Demographic and Sample Characteristics^a

Characteristic	Participants, n (%)
Education (n = 352)	
≤8th grade	23 (6)
Some high school	61 (17)
High school diploma/general education diploma	158 (45)
Technical school	49 (14)
Associate degree	33 (9)
Bachelor's degree	21 (6)
Graduate degree	7 (2)
Age, y (n = 354)	
18–35	103 (29)
36–55	150 (42)
56–100	101 (29)
Employment status (n = 325)	
Employed	93 (29)
Unemployed	232 (71)
Health problems (n = 352)	
≥ 2 diagnosed medical problems	224 (64)
≥ 1 diagnosed mental health and substance abuse problems	228 (65)
Children with special needs (n = 171)	
No	129 (75)
Yes	49 (25)
Disability benefits (n = 340)	
No	192 (57)
Yes	148 (43)
Ethnicity (n = 352)	
White	229 (65)
Black	76 (21)
Hispanic	27 (8)
Asian	3 (1)
American Indian/Alaska native	41 (12)
Native American/Pacific Islander	2 (1)
Family status (n = 352)	
Married	94 (27)
Single	125 (35)
Living with partner	29 (8)
Divorced/separated	81 (23)
Widowed	23 (6)
Sex (n = 352)	
Female	265 (75)
Male	87 (25)
Veteran status (n = 352)	
No	333 (95)
Yes	19 (5)
Children aged < 18 y (n = 346)	
No	187 (54)
Yes	159 (46)

^aReprinted from Jelley M, Wen F, Miller-Cribbs J, et al. Adverse childhood experiences, other psychosocial sources of adversity, and quality of life in vulnerable primary care patients. *Perm J*. 2020;24:18.277⁴⁶ with permission from The Permanente Press.

measure. The PTSS sum score was statistically associated with higher ACE scores (Table 4).

A comparison of the participants' scores on the PC-PTSD with a diagnosis of PTSD recorded in the electronic health record revealed an inconsistency between patients' significant reports of trauma-related symptoms and the physicians' diagnostic findings. Five percent of the sample had a diagnosis of PTSD recorded in the electronic health record; however, a little over half of the sample indicated 1 or more trauma symptoms, with 22% reporting all symptoms on the PC-PTSD scale. Specifically, 35% of the participants reported nightmares/intrusive nightmares, 41% reported avoidance behaviors, 35% reported hypervigilance, and 33% reported detachment/numbing. Over one-third of the

Table 2. Participant Reports of Vulnerability and Disadvantage

Item	Participants
Material hardship, n (%)	
Food insecurity	101 (29)
Problems paying utilities	187 (53)
Eviction	29 (8)
Utilities shut off	83 (24)
Forego medical care	130 (37)
Housing problems, n (%)	
Ceiling/roof	53 (16)
Plumbing	72 (21)
Broken windows	39 (11)
Exposed wires	16 (5)
Rats/mice/roaches	123 (36)
Holes in floor	20 (6)
Holes in ceiling	39 (11)
Community problems, n (%)	
Vandalism	Rarely: 203 (66) Sometimes: 71 (23) Often: 32 (11)
Crime	Rarely: 190 (61) Sometimes: 67 (22) Often: 54 (17)
Trash/litter/garbage	Rarely: 202 (62) Sometimes: 66 (20) Often: 58 (18)
Rundown houses	Rarely: 230 (70) Sometimes: 48 (15) Often: 49 (15)
Odors/smoke/gas	Rarely: 277 (85) Sometimes: 29 (9) Often: 19 (6)
Stray dogs	Rarely: 197 (60) Sometimes: 64 (19) Often: 69 (21)
Lack of jobs	Rarely: 115 (47) Sometimes: 48 (20) Often: 81 (33)
Barriers to health care, n (%)	
Do not have insurance currently	82 (24)
Needed health care/no insurance	169 (49)
Spent some time in the last year without insurance	120 (36)
Needed health care/no money	186 (54)
Emergency department visit because no primary care physician	185 (54)
Used payday lender for health care costs	25 (7)
Medical debt	198 (57)
Gone without medical care in last year	130 (37)
Social support, mean (SD) ^a	27.36 (8.23)
Health literacy, mean (SD)	4 (1.43)
Food stamps, n (%)	
No	149 (43)
Yes	201 (57)

^aHigher scores indicate higher levels of each: social support (range, 7–88), health literacy (range, 0–5).

participants reported 3 or more PTSS, indicating a potential clinical diagnosis of PTSD.⁴⁵

The first step in the hierarchical regression model included demographic variables such as ethnicity, age, sex, and education, as well as other SDH such as health care barriers, health literacy, social support, community problems, material hardship, and receipt of food stamps, accounting for 22% of the variance. All variables predicted PTSS, except age, sex, and ethnicity. At the second step, intimate partner violence predicted PTSS, with this model accounting for 24% of the variance. When the ACE summary score was included in the final model, 37% of the variance in PTSS symptoms was accounted for overall, and the ACE score was

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Table 3. Participant Reports of ACE and PTSS^a

ACE category	
Verbal abuse	41.6
Physical abuse	31.9
Sexual abuse	28.1
Emotional neglect	34.1
Physical neglect	19.6
Witness interpersonal violence	24.7
Separated/divorced	58.8
Alcohol/drugs	36.8
Mental illness	26.8
Prison	17.5
ACE score, mean (SD)	3.15 (2.68)
PTSD symptoms	
Nightmares/intrusive memories	64.5
Avoidance behaviors	41.7
Hypervigilance	34.5
Detachment/numbing	33.1
PTSD score, mean (SD)	1.44 (1.64)

^aData are presented as % unless otherwise specified.

Abbreviations: ACE = adverse childhood experiences, PTSS = posttraumatic stress symptoms.

the strongest predictor. While social support, community problems, and receipt of food stamps were associated with PTSS in this model, these variables were not significantly associated with PTSS once ACE was included in the next model. The other independent variables significantly related to PTSS were education, health literacy, health care barriers, and material hardship (Table 5).

DISCUSSION

This research found prevalent PTSS that was underdiagnosed in a vulnerable primary care population. PTSS was found to be significantly associated with sources of adversity—notably ACE as well as education, health literacy, health care barriers, and material hardship. When added to the final model, ACE accounted for most of the variance in PTSS.

In aggregate, our study extends previous work on the associations between ACE and trauma symptomatology investigated with SDH.⁴⁷ Our findings have important implications not only for the clinical effects on patients, but also for primary care providers and health systems. In particular, our results reinforce the need for trauma-informed primary care practices including a more thorough exploration of complex trauma effects on patients presenting for treatment.⁴⁸ Our findings suggest that it is important to assess specifically for historical (eg, ACE) and concurrent (eg, material hardship, community problems) sources of adversity to effectively work with patients' PTSS. Trauma-informed care includes trauma-sensitive interviewing, assessment of SDH, and use of treatment practices that acknowledge the effects of trauma on a patient's chronic health conditions that will influence the utilization of services and the patient's capacity for engaging in treatment.^{49–51}

Provision of care for patients with a history of ACE, intimate partner violence, and trauma symptomatology adds

Table 4. Reported PTSS and Rates of ACE

PTSD Symptom	ACE 0–1	ACE 2–3	ACE ≥ 4	Total	χ ² (df)
Numb/detached					
No	91.7	65.9	43.7	66.9	64.46 (2)*
Yes	8.3	34.1	56.3	33.1	
Nightmares					
No	89.3	62.6	41.6	64.5	61.65 (2)*
Yes	10.7	37.4	58.4	35.5	
Avoidance					
No	86.9	57.0	32.3	58.5	76.50 (2)*
Yes	13.1	43.0	67.7	41.5	
Hypervigilance					
No	91.0	62.4	43.3	65.5	63.14 (23)*
Yes	9.0	37.6	56.7	34.5	

* $P < .0001$.

Abbreviations: ACE = adverse childhood experiences, PTSD = posttraumatic stress disorder, PTSS = posttraumatic stress symptoms.

Table 5. Hierarchical Regression Analysis Examining the Association of PTSS (dependent variable) With Demographic Factors (model 1), Experiences of Interpersonal Violence (model 2), and Adverse Childhood Experiences (model 3) (N = 306)^a

Predictor Variable	Model 1 β	Model 2 β	Model 3 β
Age	−0.032	−0.037	−0.062
Sex	0.019	0.015	−0.018
Ethnicity	0.029	0.021	−0.003
Education	0.108*	0.114*	0.113*
Health literacy	−0.154**	−0.159**	−0.147**
Health care access	0.260***	0.235***	0.123*
Social support	−0.112*	−0.114*	−0.075
Community problems	0.142**	0.124*	0.052
Material hardship	0.127*	0.120*	0.110*
Food stamps/SNAP	0.120*	0.114*	0.070
Intimate partner violence (ever)		0.145**	0.098*
ACE sum			0.414***
Adjusted R ²	0.219	0.236	0.372
F for change in R ²	9.622***	7.788*	65.365***

^aβ is the standardized regression coefficient and indicates the individual contribution of each predictor to the model. Adjusted R² indicates how much of the variability in the dependent variable is accounted for by the predictors, adjusted for the number of predictors in the model. F change represents the statistical test of improvements in each model.

* $P < .05$, statistically significant.

** $P < .01$, statistically significant.

*** $P < .001$, statistically significant.

Abbreviations: ACE = adverse childhood experiences, PTSS = posttraumatic stress symptoms, SNAP = supplemental nutrition assistance program.

to the challenge of treating chronic health conditions in the primary care setting because of the many layers of complicated issues patients bring to the encounter.^{19,52} Ability to address the complexity of the health and behavioral problems of these patients in the typical encounter is also impacted by visit time constraints as well as the patients' struggles with trusting their providers.⁷ Appreciating the impact of PTSS on adult health and then intervening effectively and appropriately are key features for improving provider sense of competency while also positively impacting health care outcomes. While knowledge about the occurrence of PTSS in primary care clinic populations has increased, models for addressing trauma sequelae in primary care settings have lagged behind. Promising trauma-informed interventions have not been extensively, or significantly, implemented into most primary care training settings.

In the context of the extant research regarding ACE-related chronic health outcomes, our findings further affirm the importance of using population health management to identify groups of patients who may be at higher risk for medical illness, addiction disorders, disability, social dysfunction, and poor engagement in treatment.^{7,23,32} Intervening with those adult patients who experienced multiple ACE who also endorse PTSS can positively affect engagement with providers and enhance clinical outcomes such as following treatment recommendations.^{40,53,54}

Trauma-informed discussions of PTSS effects on adult patient health may decrease future maladaptive reactions to environmental stressors that lead to physical and social dysfunction, including the inability to fully engage in health prevention activities or participate in continuity of care and treatment planning.^{49–51} Adoption of trauma-informed care practices shows promise for improving patient engagement, treatment adherence, and health outcomes, as well as provider and staff wellness.⁵⁵ With the addition of effective provider training in communication skills and education in trauma-informed communication, it is hypothesized that physicians will approach patients with complicated trauma with a sense of competency and compassion.^{46,56–58}

Because of our previous findings that high rates of PTSS, ACE, and SDH are strongly associated with negative health effects, our team created and implemented a training

intervention for our primary care faculty members, resident physicians, and medical students. Our training is one of the growing efforts in the United States to build trauma-informed medical education, with recent efforts to coalesce educators through a national collaborative on Trauma-Informed Health Care Education and Research (<https://www.trauma-informedcare.com/>).

There are limitations that should be considered when interpreting the findings in our study. Recall bias may have influenced participant responses; however, the direction of the bias cannot be determined. Previous studies of ACE findings note that patients were more likely to underreport adversity in childhood.⁵⁸ Geographic location and research conducted in university-based clinics may also limit generalizability to other practice venues.

In summary, our finding that ACE and trauma symptomatology are related to SDH advances previous work in this area and has significant implications for clinical practice and training of health care professionals in primary care settings. Among the many existing challenges of practice in primary care, addressing the needs of patients with a history of ACE and trauma is key to improved patient outcomes and engagement. Educational and health systems models that address ACE and trauma in primary care using population health management strategies to identify at-risk patients are needed.

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For the CME Posttest, see next page.



POSTTEST

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1. How will the absence of trauma-informed practices impact patients?
 - a. Potential retraumatization and poor patient-provider engagement due to insensitive provider reactions
 - b. Development of posttraumatic stress disorder (PTSD), depression, and other mental health symptoms
 - c. Decreased utilization of health care, especially at emergency care centers
 - d. a and c
2. In this study of patients at a clinic for the uninsured or underinsured, over one-half of patients reported 1 or more trauma symptoms. What percentage of patients reported having all symptoms on the Primary Care PTSD screener?
 - a. 42%
 - b. 32%
 - c. 22%
 - d. 12%
3. Kwame is a military veteran. He is recently divorced and lost his job at a steel manufacturing plant because he was unable to tolerate the elevated noise levels. Kwame has had frequent outbursts of anger and frustration. He reports trouble sleeping and frequent nightmares from which he awakens with a rapid heartbeat and in a state of fear. Kwame is requesting help for sleep, lower back pain, and elevated blood pressure. Which strategy reflects best practices of trauma-informed care that you can implement for Kwame?
 - a. Treat his back pain and sleep issues with medication and recommend diet changes for hypertension
 - b. Screen for past trauma, and, if positive, explore his interest in pursuing trauma treatment while treating his other conditions
 - c. Treat his blood pressure and sleep problems, and refer him to physical therapy for back pain
 - d. Refer him to psychiatry to focus on impulse control to reduce his frequent outbursts of anger and frustration

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