Feasibility of Expanded Emergency Department Screening for Behavioral Health Problems

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ABSTRACT

OBJECTIVES: Behavioral health conditions and social problems are common yet underrecognized among emergency department (ED) patients. Traditionally, ED-based behavioral health screening is limited. We evaluated the feasibility of expanded behavioral health screening by a trained nonclinician.

STUDY DESIGN: Prospective observational study of a convenience sample of ED patients.

METHODS: A research assistant (RA) approached a convenience sample of adult ED patients within an integrated healthcare delivery system. Patients completed a paper screening instrument (domains: mood, anxiety, alcohol use, drug use, sleep, intimate partner violence, and chronic pain) and reviewed responses with the RA, who shared positive screening results with the treating ED physician. We abstracted behavioral health and medical diagnoses from the electronic health record (EHR), comparing the screened cohort with the eligible population. We used χ^2 tests to assess differences in demographics and comorbidities between screened patients and the eligible group and differences between self-reported symptoms and EHR diagnoses among screened patients.

RESULTS: Among 598 screened patients, the prevalence of self-reported symptoms was higher than that of associated EHR diagnoses in the year prior to the ED visit (anxiety, 45% vs 19% [*P* <.001]; depression, 40% vs 22% [*P* <.001]; drug use, 7% vs 4% [*P* = .011]; risky alcohol use, 12% vs 5% [*P* <.001]; chronic pain, 47% vs 30% [*P* <.001]; and sleep problems, 47% vs 4% [*P* <.001]).

CONCLUSIONS: A dedicated RA was able to integrate screening into patient idle times in the ED visit. The prevalence of behavioral health problems was higher than indicated in the EHR.

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Research findings suggest that behavioral health conditions such as depression, anxiety, and alcohol and drug misuse, as well as intimate partner violence (IPV), are common among emergency department (ED) patients[1,2] and that their prevalence is higher than typically noted by ED physicians and staff.[3-5] These conditions are a source of considerable morbidity (eg, disability-adjusted life-years lost due to depression/anxiety), are associated with other common health conditions and poorer health outcomes, and can drive healthcare utilization and costs.[6-9] Although effective interventions for these conditions exist, identification is essential to providing patients with appropriate referral and treatment.

Historically, widespread screening among ED patients has been limited to acute risk for suicide and IPV. However, the typical ED visit is interspersed with periods of idle time during which patients wait for test results, re-evaluation by clinicians, and treatment effects. These intervals create opportunities for screening, brief interventions, and referrals to treatment or other resources.

Previous behavioral health screening pilot implementation studies in the ED have focused primarily on alcohol and drug abuse and suggest feasibility, albeit with concerns about workload for ED providers and intervention fidelity.[5,10-14] The screening instruments used in US-based studies were lengthy, and the pilot periods were short (1 week). A brief screening instrument that covers several key domains has not been tested in the ED setting. Furthermore, IPV, chronic pain, and sleep problems are important contributors to depression, anxiety, and alcohol and drug use.[15-19] Screening, intervention, and referral for these conditions in ambulatory care settings such as primary care has increased detection and treatment initiation rates.[20,21] However, patients may miss opportunities for screening and referral to treatment if their main point of contact with health services is the ED.

This study examined the feasibility of introducing screening for common behavioral health problems in the ED setting using an embedded research assistant (RA) and a brief screening instrument. We also examined the rates of documented diagnoses compared with self-reported problems covered in the screener among patients presenting for ED services in an integrated healthcare system.

TAKEAWAY POINTS

Behavioral health problems (depression, anxiety, and alcohol and drug misuse) are common yet underrecognized in emergency department (ED) patients. These conditions contribute to other health conditions, such as diabetes and hypertension, but if they are undiagnosed, they go untreated. Improving our detection of these conditions can accelerate referral to and initiation of treatment and improve downstream health outcomes and costs.

- Leveraging a nonclinician to perform screening in the ED was successful and nonintrusive.
- The prevalence of behavioral health conditions was higher than identified in the electronic health record.
- Further studies linking screening to pathways for referral to treatment and assessing quality outcomes would be helpful.

METHODS

Setting

Kaiser Permanente Northern California (KPNC) is a nonprofit integrated healthcare delivery system providing comprehensive healthcare services to more than 4 million members in northern California. KPNC provides integrated medical and specialty psychiatric and chemical dependency treatment within the health system. Members are racially and socioeconomically diverse and representative of the regional population.[22] The study ED is the site of 65,000 annual visits and is staffed by more than 60 full-time board-certified or board-eligible physicians and 220 nurses.

Study Population

KPNC members 18 years or older with no health plan enrollment gaps of greater than 3 months in the year prior to their index ED visit (during the study period, October 10, 2015, to June 12, 2016) were eligible to participate. Patients were initially eligible if they presented with non–life-threatening and nonminor complaints and were defined as having an Emergency Severity Index (ESI) score of 2 or 3. The ESI calculator is a commonly used triage algorithm for stratification based on acuity and predicted resource needs that grades patients from level 1 (most urgent) to level 5 (least resource intensive).[23] Patients who were seen in the "fast-track" area of the ED for minor complaints (ESI score of 4 or 5) were considered ineligible because their length of stay was typically too short to allow for screening without interrupting workflow.

Over the study period, an RA approached ED patients who met eligibility criteria in their treatment rooms, 5 evenings per week (Monday through Friday), from approximately 3 PM to 10 PM. Patients verbally consented to participate and completed a paper screening tool covering the following domains: depression, anxiety, alcohol use, drug use, sleep, IPV, and chronic pain. The RA reviewed the screener with patients for clarity and confirmed affirmative responses. The RA also suggested to patients that they discuss positive results with their care team. The ED attending physician was notified of positive screening results, and the care team addressed the identified concerns based on clinical judgment.

This screening pilot was supplemental to currently practiced screening for IPV and emergent psychiatric conditions, which were separate from the study protocol. Current ED practice for addressing IPV and emergent psychiatric conditions includes consultation with psychiatry and mental health, as well as social work referral. Because the screener conditions did not require emergent intervention and because our study was designed to assess screening feasibility, we did not have mandated referral pathways but instead relied on patient–clinician and RA–clinician communication for next steps.

Because the RA was in the ED only during limited hours, our screened cohort comprised a convenience sample of eligible patients during the study period. Our RAs did not document patients who declined to participate, so the cohort consists of only those patients who agreed to participate.

Feasibility of the proposed screening intervention was assessed during the prestudy period through qualitative discussions with ED physicians, nursing staff, social workers, administrative staff, and behavioral health leadership. We observed ED clinical workflow in relation to screening activities to ensure minimal disruption of the ED visit. We also identified treatment team members with whom the RA would communicate before approaching patients to confirm that the screening activity would not delay treatment.

The study was approved by the KPNC Institutional Review Board.

Measures

Electronic health record. Patient age, race/ethnicity, gender, and psychiatric and medical comorbidities based on *International Classification of Diseases, Ninth Revision* and *Tenth Revision* diagnosis codes were extracted from the electronic health record (EHR). We identified psychiatric diagnoses (eg, alcohol or drug use disorders, depression, anxiety, and psychotic disorders; specific codes available on request) and other chronic disease diagnoses (Charlson Comorbidity Index [CCI]) in the year prior to each patient's index ED visit. To ensure accurate ascertainment of these demographic and comorbidity variables, we included only patients without prolonged health plan membership gaps.

Screening instrument. All participants completed the same screening tool (**eAppendix** [available at **ajmc.com**]). Questions from the National Institute on Alcoholism and Alcohol Abuse's validated clinician screening guide were used,[24] including the number of heavy drinking days (≥4 drinks for women, ≥5 drinks for men) in the past 3 months, drinking days per week, and typical number of drinks per drinking day. Drug use questions were based on the National Institute on Drug Abuse (NIDA)–validated NIDA Quick Screen[25] and assessed past-year frequency (never, less than monthly, monthly, weekly, daily/almost daily) of marijuana use and of illegal drug use or prescription drug misuse.

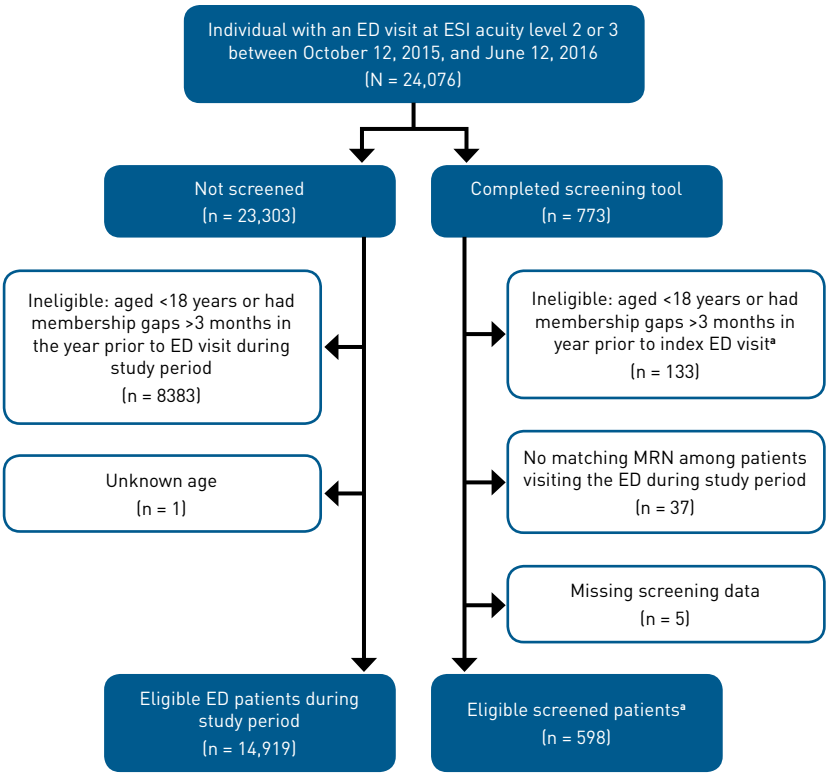
The Patient Health Questionnaire (PHQ-2) is a validated 2-item symptom-based screening instrument based on *Diagnostic and*

Statistical Manual of Mental Disorders, Fifth Edition depression criteria, asking patients about mood symptoms in the prior 2 weeks.[26] The General Anxiety Disorder questionnaire (GAD-2) is a validated 2-item anxiety symptom screening instrument.[27]

Questions about IPV were informed by validated instruments such as the HARK (Humiliation, Afraid, Rape, Kick) and the HITS (Hurt, Insulted, Threatened with harm, Screamed at them) and recommended by the health system's Director of Family Violence Prevention. These questions included whether the patient was currently in a relationship in which their partner hit, slapped, kicked, choked, or hurt them, or had threatened them, and whether they had ever had a partner who physically hurt or threatened them.[28-30]

Chronic pain items included whether they had experienced chronic pain during the previous 6 months, and if so, whether they felt able to manage their pain well. Sleep questions included the average number of hours of sleep per night and whether they felt that amount was adequate. Because validated tools to assess sleep, IPV, and chronic pain are limited, we relied on questions recommended by KPNC clinical leaders for these domains.

FIGURE 1. Cohort Assembly Diagram



ED indicates emergency department; ESI, Emergency Severity Index; MRN, medical record number.
[a]Research assistants did not know membership status or gaps prior to administering screening instrument.

Statistical Analysis

Chi-square tests were performed to assess baseline differences in demographics and comorbidities between screened patients and the full cohort. All analyses were performed using SAS 9.3 (SAS Institute, Inc; Cary, North Carolina).

RESULTS

Over the study period, 598 of 773 patients who completed the ED screener met eligibility criteria and had complete data. We also identified from the EHR a group of 14,919 patients evaluated in the ED during the study period who met eligibility criteria (age ≥18 years, membership gaps <3 months, ESI level 2 or 3) but were not screened (**Figure 1**). Screened patients were largely similar to the eligible group with regard to psychiatric comorbidities, as indicated by EHR data, although they had slightly higher rates of depression (22% vs 18%, respectively; $P = .009$), panic disorder (4% vs 3%; $P = .03$), chronic pain (30% vs 26%; $P = .018$), and several chronic medical conditions (**Table**).

Self-reported Symptoms Compared With Diagnoses

Except for IPV, the prevalence of self-reported behavioral health symptoms among those screened was higher than that of diagnoses made in the year prior to the index ED visit (**Figure 2**). Notably, almost half (45%) of patients endorsed anxiety symptoms, although only 19% had an anxiety diagnosis in the year prior ($P < .001$). Similarly, 40% of patients endorsed depressive symptoms, although only 22% had a related diagnosis ($P < .001$). Self-reported drug use (7%) and hazardous alcohol use (12%) were approximately double the prevalence of associated diagnoses (4% [$P = .011$] and 5% [$P < .001$], respectively). The largest disparity between endorsed symptoms and clinical diagnoses was recorded for sleep disorders and associated symptoms (sleep disorder diagnosis, 4.2% vs self-reported sleep problems, 47%; $P < .001$). Chronic pain was the most common past-year diagnosis of all conditions assessed (30%), although self-reported chronic pain was significantly higher, in 47% of patients ($P < .001$).

Feasibility

The RA was able to approach patients and offer screening for common behavioral health conditions within the workflow and timing of the ED visit. Communication with clinical providers (nurses and physicians) was important in identifying suitable times to approach patients and ascertaining that patients were medically stable and appropriate for screening. The RA either left the screener with the patient, returning for the completed survey at a later time, or,

TABLE. Demographic and Clinical Characteristics of Patients Administered an ED Screening Compared With All Eligible[a] Patients With an ED Visit

Characteristic	Screened Patients	Full Cohort	*P*[b]
Total, n	598	14,919	
Race, n (%)			
White	222 (37.6)	4673 (31.8)	**.004**
Hispanic	127 (21.5)	4021 (27.4)	
Black	126 (21.4)	2854 (19.4)	
Asian/Hawaiian/Pacific Islander	88 (14.9)	2457 (16.7)	
Multiple or N/A	27 (4.58)	687 (4.68)	
Gender, n (%)			
Female	372 (62.2)	8700 (58.3)	.058
Male	226 (37.8)	6219 (41.7)	
Age in years, n (%)			
18-24	50 (8.36)	1465 (9.8)	**.035**
25-34	62 (10.4)	1848 (12.4)	
35-44	73 (12.2)	1977 (13.3)	
45-54	97 (16.2)	2295 (15.4)	
55-64	125 (20.9)	2412 (16.2)	
≥65	191 (31.9)	4922 (33.0)	
CCI score,[c] n (%)			
0	344 (57.8)	9919 (66.5)	**<.001**
1-2	162 (27.2)	3562 (23.9)	
≥3	89 (15.0)	1430 (9.6)	
Past-year comorbidity diagnoses,[c] n (%)			
Psychiatric comorbidities			
Depressive disorders	131 (21.9)	2642 (17.7)	**.009**
Anxiety disorders	113 (18.9)	2440 (16.4)	.10
Schizophrenic disorders	5 (0.84)	145 (0.97)	.74
Bipolar spectrum disorders	13 (2.17)	481 (3.22)	.15
Obsessive-compulsive disorders[d]	4 (0.67)	76 (0.51)	.55
Panic disorders	24 (4.01)	382 (2.56)	**.029**
Substance use disorders	99 (16.6)	2292 (15.4)	.43
Alcohol use disorder	29 (4.85)	642 (4.30)	.52
Drug use disorder	23 (3.85)	600 (4.02)	.83
Medical comorbidities			
Asthma	144 (24.1)	2744 (18.4)	**<.001**
Chronic heart disease	119 (19.9)	1962 (13.2)	**<.001**
COPD	69 (11.5)	1211 (8.12)	**.003**
Diabetes	170 (28.4)	3398 (22.8)	**.001**
ESRD	20 (3.34)	277 (1.86)	**.009**
Hypertension	332 (55.5)	6626 (44.5)	**<.001**
Other comorbidities			
Intimate partner violence[d]	3 (0.50)	92 (0.62)	>.999
Sleep disorders	25 (4.18)	578 (3.87)	.70
Chronic pain	178 (29.8)	3800 (25.5)	**.018**

CCI indicates Charlson Comorbidity Index; COPD, chronic obstructive pulmonary disease; ED, emergency department; ESRD, end-stage renal disease; N/A, not applicable.

[a]Eligibility criteria required being 18 years or older and having health plan membership with no more than a 3-month gap in health plan membership in the year prior to the ED visit date.

[b]Bold indicates $P < .05$.

[c]Comorbidity diagnoses were included from the year prior to the ED visit date.

[d]Fisher's exact test was used to test differences to account for cell counts less than 5.

for patients who preferred it, would read the questions to the patient. The RA reviewed the responses and discussed questions with unclear or unmarked answers, as well as affirmative answers, with the patient.

Because our study examined feasibility of screening, we did not collect data on occurrence, rates, and outcomes of physician-initiated referrals. The total time per patient screened was approximately 15 minutes, including the time from introducing the screener, allowing time for self-administration, and reviewing results with the patient.

DISCUSSION

In this pilot study, we assessed the feasibility of adding a behavioral health screening instrument to the ED workflow and examined self-reported behaviors and symptoms compared with diagnoses documented in the EHR. Similar screening for alcohol and drug use, as well as depression, is performed in the ambulatory setting, but this pilot was the first attempt in this health system to perform this screening in the ED.[20,21,31] ED visits represent an important opportunity to identify behavioral health problems, yet systematic screening for these rarely occurs beyond IPV and suicide risk. Opportunities exist in the idle times that patients experience during ED visits to expand screening to more occult behavioral health problems without disrupting workflow.

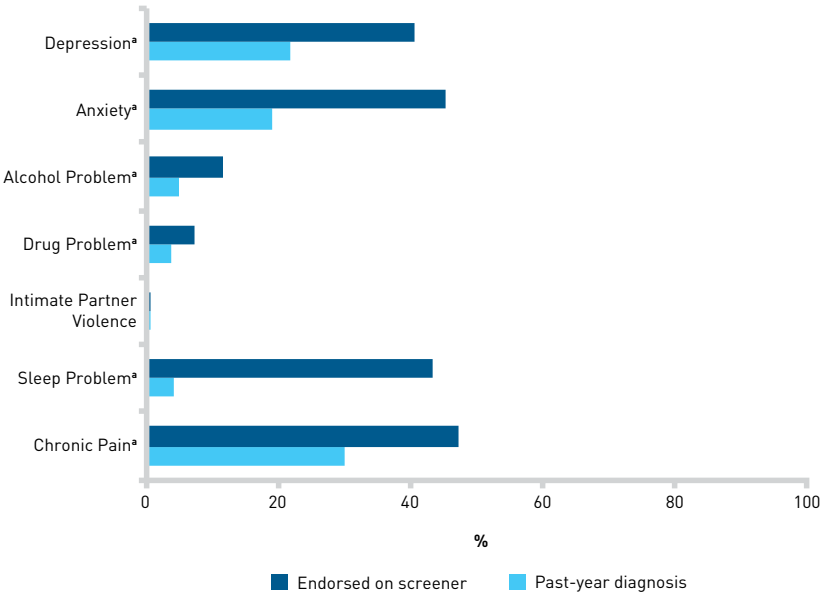
The screener we tested was not a diagnostic assessment instrument, and endorsement of symptoms does not constitute a diagnosis. Nevertheless, a considerable proportion of screened patients endorsed these symptoms, which adds to our understanding of unrecognized behavioral health problems among ED patients.[3,32,33] We incorporated validated screening tools that are widely used in healthcare settings and have relatively high sensitivity and specificity for depression and anxiety: PHQ-2 and GAD-2 have specificities of 76% and 81% and sensitivities of 89% and 76%, respectively. This suggests that a substantial proportion of patients with positive screening would meet diagnostic criteria for these disorders.[26,27,34]

The ED offers an opportune context for screening for behavioral health issues: Many

patients come to the ED in crisis and may be more willing to reveal symptoms of distress that otherwise might remain unidentified and untreated. Additionally, some patients' only contact with the health system is the ED, leaving these encounters as the sole opportunity to screen them and refer for treatment.

Recognizing that the prevalence of behavioral health symptoms in ED patients is higher than is currently identified is important because these symptoms cause considerable distress and morbidity on their own, exacerbate chronic health conditions, and may result in higher health services utilization and costs. Examples include the adverse effects of alcohol consumption on hypertension and of depression on post–myocardial infarction outcomes, healthcare utilization, and chronic medical conditions.[7-9,35] Early identification of these comorbid conditions can help facilitate clinical attention or specialty treatment initiation.[36-42] Depression, anxiety, and alcohol or drug misuse are known to adversely impact health outcomes, costs, and utilization. The prevalence of these symptoms that we observed in the ED suggests that expanded screening, with referral and treatment as indicated, would be of value at the individual and health system levels.

FIGURE 2. Comparison of Past-Year Diagnoses Versus Endorsement on Screener Among Screened Patients (N = 598)



[a]Endorsement prevalence significantly different from diagnosis prevalence at α <.05.

Understanding how to effectively implement screening into the ED workflow is challenging. To that end, we examined feasibility and found that having an ED-embedded RA conduct screening was possible and created minimal disruptions to normal clinical workflow. Questions remain about the scalability of systematic screening, which we were unable to address in the absence of additional research funding. Implementing systematic screening into regular ED operations during all 24 hours per day of its operations would require existing staff to assume screening responsibilities or additional personnel, both of which are resource allocation concerns for ED leaders. Clinical response workflows for positive responses (eg, brief interventions, information, referrals to specialty care and/or community resources) are also necessary. As previous studies have shown, large-scale implementation of ED-based Screening, Brief Intervention, and Referral to Treatment for drug and alcohol abuse resulted in widespread adoption and high referral and treatment initiation rates in Massachusetts, but long-term outcomes are unclear.[10,43,44]

Technology could be leveraged to facilitate the integration of behavioral health screening into the ED workflow. A systematic review of technology-based behavioral health interventions in the ED found high levels of acceptability and feasibility, but limited evidence on efficacy, especially with limited measuring or reporting of clinical outcomes such as decreased IPV incidence or alcohol use.[45,46] The optimal approach to behavioral health screening in the ED remains to be determined, but might include some mix of electronic screening with in-person interaction, intervention, and referral.

We found significantly higher levels of self-reported depression and anxiety symptoms, risky alcohol and drug use, sleep problems, and chronic pain compared with documented diagnoses. Although screening is by nature less specific than a formal assessment and diagnostic process, the magnitude of differences identified supports the findings of previous research suggesting that ED patients may have higher prevalence rates, and lower rates of detection, than the general population.[5,32,33,47,48] Similar discrepancies between prevalence of diagnoses and positive screening for behavioral health conditions have also been found among primary care patients, especially among patients with lower utilization of health services.[5,49] As such, the ED may be the only opportunity to screen for and detect behavioral health problems in this subset of patients with limited healthcare contact. Performing screening in the ED would leverage that healthcare contact to allow appropriate and timely referral to primary care, mental health, or drug and alcohol treatment.

Our screened cohort was not identical to the eligible population. The differences, however, were minor and to be expected with convenience sampling, limited hours, and our small sample (4% of similar ED patients). The 2 groups had small racial/ethnic and age differences, and the screened sample had more medical comorbidities, higher overall CCI scores, and higher prevalence of depression and panic disorders. Chronic medical conditions are known to be associated with increased prevalence of depression and anxiety disorders, which may partially explain the higher observed

prevalence in the screened population.[35,50] However, the observed rates of positive depression and anxiety screens are similar to those that have been reported in other studies of ED patients.[2,4,33]

Limitations

As this was a feasibility study, research staff hours were limited and we were unable to serially screen every eligible patient. We did not approach patients seen in the fast-track section of the ED, who represent up to 40% of ED patients, nor were patients with truly emergent medical problems screened. Because participation was voluntary, patients self-selected into or out of screening. All of these limitations introduce the potential for bias, and the screened sample may not be representative of all ED patients in both measured and unmeasured variables. Although we were unable to compare self-reported symptoms between the 2 groups, we did compare self-reported symptoms with their past-year diagnoses, and we found higher proportions of medical, depression, and panic disorder diagnoses among the screened group. It may be that eligible patients who were more severely ill spent longer in the ED and thus had more time to be approached for screening, or that their medical or mental health problems made them more willing to be screened.

Although this facility is subject to the same regulations governing all EDs in the United States and thus accepts all patients, for these analyses, we limited the sample to health system members in order to have access to their EHR data. Because this is a private, nonprofit healthcare delivery system, its population may not be representative of ED populations in public systems.

CONCLUSIONS

Our findings from this pilot study suggest that ED patients may experience relatively high rates of emotional distress and behavioral health problems—higher than suggested by the diagnoses documented in the EHR. ED visits may offer an important clinical context for screening for these concerns. Brief screening for common behavioral health problems in the ED setting proved feasible in this convenience sample, which was supported by research funding. However, implementing universal screening would require additional investments in personnel or adding to the work of existing staff, as well as implementing pathways for further brief intervention, referral, and treatment. Adding brief intervention and referral in coordination with outpatient referral resources would likely be more efficacious than simple screening. ■

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eAppendix. ED Behavioral Health Screening Instrument MRN_____

Over the past two weeks, how often have you been bothered by any of the following problems?				
	Not at all	**Several days**	**More than half the days**	**Nearly everyday**
Little interest or pleasure in doing things.				
Feeling down, depressed, or hopeless.				
Feeling nervous, anxious, or on edge				
Not being able to stop or control worrying				

How many times in the <u>past three months</u> have you had 4+/5+ drinks containing alcohol in a day?	
On average, how many days a week do you have an alcoholic drink?	
On a typical drinking day, how many drinks do you have?	

	Never	**Less than monthly**	**Monthly**	**Weekly**	**Daily or almost daily**
How often in the past year have you used marijuana?					
How often in the past year have you used an illegal drug or used a prescription medication for non-medical reasons?					

	Yes	**No**	**Don't Know / Refuse**
Are you currently in a relationship where your partner hits, slaps, kicks, chokes or hurts you?			
Are you currently in a relationship where you feel threatened by your partner or ex-partner?			
Have you ever had a partner who physically hurt or threatened you?			

On a scale of 1 to 5, with 1 = Not at all confident, and 5 = Very confident, How confident are you in your ability to:	
-know what questions to ask a health care provider?	
-get a health care provider to answer all of your questions?	
-make the most of your visit with the health care provider?	
-get a health care provider to take your chief health concerns seriously?	
-get a health care provider to do something about your chief health concern?	
How many hours of sleep do you usually get per night?	
Is that enough hours of sleep for you to perform well on a daily basis?	

Would you be interested in attending any health programs in primary care? (*please check all that apply*)

Fitness ☐	Healthy living ☐	Stress management ☐	Counseling ☐

What is/are your preferred methods of receiving health or wellness information? (*please check all that apply*)

☐ On-line content	☐ Pamphlets/brochures	☐ Videos or podcasts	☐ In-person	☐ Other: _____

Are you registered for KP.org? ☐ Yes ☐ No	Have you ever accessed **KP.org** ☐ Yes, at home ☐ Yes, elsewhere ☐ No

Do you always make an appointment when you feel like you need to see the doctor?	☐ Yes	☐ No	☐ Refused/Don't know
Do you feel like you can make an appointment whenever you need to?	☐ Yes	☐ No	☐ Refused/Don't know
Have you had chronic pain during the past 6 months?	☐ Yes	☐ No	☐ Refused/Don't know
If yes, do you feel that you are able to manage your chronic pain well?	☐ Yes	☐ No	☐ Refused/Don't know

How do you manage your chronic pain? ***Please check all that apply***

☐ Medication (Specify): _____ ☐ Complementary & Alternative Medicine (i.e., acupuncture)

☐ Massage ☐ Nothing ☐ Refused/Don't know