

Supporting Healthcare Workers Well-Being and Suicide Prevention: The HEAR Program May 2009 – April 2023

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ABSTRACT:

Purpose: To present the first 14 years' data from 1 academic institution using the American Foundation for Suicide Prevention's online Interactive Screening Program (ISP). The ISP probes suicide risk factors in healthcare workers, utilization of mental health services, levels of engagement, and seeks to reduce barriers to help-seeking.

Design: Data from all healthcare system students, medical trainees, physicians, nurses, and staff who completed the ISP's online Stress and Depression Questionnaire between May 1, 2009, and April 30, 2023, were tabulated and analyzed for features related to burnout, depression, suicide risk, treatment, and engagement with program counselors.

Results: 5368 individuals engaged in ISP screening. Findings included 39.9% experiencing depression symptoms, 53.9% symptoms of burnout, and 10% suicidal ideation. In this self-selecting group, medical students reported depression symptoms less than physicians in practice, nurses almost 3 times more than physicians, and females more than males. Suicide risk was indicated by multiple domains of distress, with 49.4% in the highest risk tier. At the time of completing the questionnaire, 13.1% were receiving counseling/therapy. After receiving feedback, more than one-quarter of all participants (27.6%) engaged with the program counselors, with an additional 941 individuals who were not already receiving counseling or therapy accepting referrals to mental health providers.

Conclusion: The unattended high distress levels throughout the healthcare training and workforce demonstrated the need for safe screening and referral, while the level of engagement and referrals generated by the ISP attested to its effectiveness.

Introduction

The practice of medicine is both rewarding and stressful. Life and death decisions are made daily, and healthcare workers are asked to care for patients in what is often the most challenging phase of their and their families' lives.¹ Thus, it is no surprise that healthcare trainees and practitioners experience high rates of burnout, dissatisfaction with life and career, depression, substance use, and suicide.¹⁻⁵ Yet, despite their knowledge and resources, the healthcare workforce is equally likely, or perhaps even less likely, than others to seek mental health care.^{1,3,4} Today's healthcare workforce has inherited a stoic culture of self-sufficiency and real and/or perceived barriers to help-seeking which often neglects deterioration in wellbeing as well as opportunities to prevent the spiral into more severe, entrenched

mental health problems.⁶⁻⁸ Unaddressed depression not only leads to unhappiness and misery in professional and personal spheres, but also may be the most actionable risk for healthcare professional suicide.^{9,10}

As part of its overall wellness and healthcare workforce suicide prevention efforts, the UC San Diego Health Healer Education, Assessment, and Referral (HEAR) program aims to facilitate help-seeking behavior in its students, trainees, faculty physicians and professional staff.¹¹ This suicide prevention program's signature intervention is its implementation of the American Foundation for Suicide Prevention's (AFSP) Interactive Screening Program (ISP).¹² Developed by AFSP as a unique method of engaging at risk individuals into mental health services, the ISP provides a convenient and confidential way for individuals to take a brief screening for stress,

depression, and other mental health conditions, and receive a personal response from a program counselor with information about mental health services available to them.

The ISP has been the key component of UC San Diego's healthcare workforce suicide prevention program since 2009. Over time, the ISP has been supplemented by a variety of educational and support interventions for health system departments, clinical units, and training programs: on-demand educational and training programs, group and individual debriefings for clinical services after critical events, Schwartz Center Rounds,¹³ confidential short-term counseling for medical trainees, individual "check-in" appointments for new trainees and attending physicians, peer support trainings, and individualized consultation and/or referrals upon request. In this article, we present the first 14 years' data from the ISP to illustrate the occurrence of suicide risk factors in students, trainees, faculty and staff, utilization of mental health services, levels of engagement prompted by the ISP, concerns voiced by our healthcare workforce, and the extent to which barriers to help-seeking are addressed in this population.

Methods

Participants

UC San Diego Health-affiliated physicians, nurses, trainees, students, and other staff (eg: social workers, medical assistants, etc.) who completed the online Stress and Depression Questionnaire between May 1, 2009, and April 30, 2023, were included in our study. The program's initial target audience included all faculty physicians, residents, and medical students. In the second year of the program, 2010, it expanded to include pharmacy students and in 2016 to a broader expansion that included nursing staff and the entire health system staff from health system professionals to support personnel.

The Interactive Screening Program (ISP)

The University of California, San Diego Health HEAR program offers the ISP, a voluntary and anonymous online screening and referral tool that includes a Stress and Depression Questionnaire.^{11,12} The screening tool connects respondents with HEAR counselors and, when appropriate, provides referrals for additional mental health treatment. The online tool is widely disseminated and can be completed at any time and any location. In addition, physicians, nurses, trainees, students, and other staff receive e-mails yearly with an invitation and

link to complete the screening. Historically, between 7% and 26% of e-mail recipients have completed the screening.^{11,14-18}

Before starting the questionnaire, participants create a self-assigned user identification (ID) allowing complete anonymity. Although designed for participants to complete only once, participants may sign up again with a new user ID (as identified by the responses with repeated IDs). The present study included only the data associated with an individual's most recent response. The ISP questionnaire includes demographics and items screening for depression; measures of intense emotional distress; alcohol, and drug use; disordered eating behaviors; burnout; current suicidal thoughts, behaviors, and suicidal plans, past suicide attempts; impairment; and current mental health treatment. Lastly, an open-ended question asks about stressors. To encourage participation and personal sense of safety all questions are optional and anonymous.

Demographics

Optional limited demographic information includes age (open-ended), gender identity, ethnicity and/or race, and position (including medical student, pharmacy student, resident, fellow, pharmacist, faculty [MD, PhD, PharmD or other], nurse or other healthcare staff).

Depression severity

Depression severity in the prior 2 weeks was evaluated using the PHQ-9.¹⁹ PHQ-9 item response choices were *not at all*, *some of the time*, *a lot of the time*, and *most or all of the time*. Participants were classified as having no or minimal (PHQ-9 score of 0-4), mild (5-9), or moderate to severe depression (10-19). For purposes of this article, participants scoring in the moderate to severe depression range (10-19) were considered to meet criteria for depression.

Intense affective states associated with suicide risk

Using items adapted from the Affective State Questionnaire,²⁰ participants rated the frequency of 10 intense feeling states that have been linked to depression with suicidal ideation (SI); *Feeling nervous or worrying a lot; becoming easily annoyed or irritable; feeling life is too stressful; having arguments or fights; feeling intensely anxious or having anxiety attacks, feeling intensely lonely; feeling intensely angry; feeling hopeless; feeling desperate, and feeling out of control*. Item response choices were, *not at all*, *some of the time*, *a lot of*

the time, and most or all the time, with a lot of the time and most or all of the time regarded as endorsements.

Drinking or substance use

Participants rated the frequency of “Feeling like you were drinking too much” over the course of the 4 weeks prior to taking the questionnaire. Item response choices were *not at all*, *some of the time*, *a lot of the time*, and *most or all of the time*, with a lot of the time and most or all of the time regarded as endorsements.

Eating disturbance

Participants rated the frequency of “Feeling like you can’t control what or how much you eat” over the course of the 4 weeks prior to taking the questionnaire. Item response choices were *not at all*, *some of the time*, *a lot of the time*, and *most or all of the time*, with a lot of the time and most or all of the time regarded as endorsements.

Burnout

In 2016, 3 items were added to the questionnaire to measure burnout: “feeling burned out from your work;” “feeling emotionally drained from your work;” and “having become more callous toward people since you took this job.” For this study, burnout was represented by a score of ≥ 2 on the single item, “Feeling burned out from your work,” which was rated on a 4-point scale ranging from 0 (*not at all*), 1 (*some of the time*), 2 (*a lot of the time*) to 3 (*most or all of the time*) over the preceding 4 weeks. Other studies have found a single-item measure of burnout may be reliably used as an alternative to the Maslach Burnout Inventory to abbreviate survey material and potentially increase response rates among physicians.²¹

Suicidal thoughts and behaviors

Questions to assess suicidal thoughts and behaviors included: *thoughts about taking your own life? planned ways of taking your own life? and done things to hurt yourself?* over the past 2 weeks. Item response choices were *not at all*, *some of the time*, *a lot of the time*, and *most or all of the time*, with *some of the time*, *a lot of the time* and *most or all of the time* regarded as endorsements. Also included was a yes/no item for any past suicide attempt throughout the participant’s lifetime.

Impairment

Adapted from the PHQ-9 impairment item,¹⁹ participants rated the degree of difficulty to the item “If you checked off any problems on this questionnaire, how difficult have these problems made it for you

to do your work, take care of things at home, or get along with other people?” Item response choices were *not at all difficult*, *somewhat difficult*, *very difficult*, and *extremely difficult*.

Current mental health treatment

Included were yes/no items for whether the participant was currently, at the time of taking the questionnaire: *taking any medication for anxiety*, *any medication for depression*, or *getting counseling or therapy*.

Procedure

After submission of the questionnaire, an algorithm is used to analyze risks classified into 1 of 4 tiers: Tier 1a, Tier 1b, Tier 2, and Tier 3, indicating high, moderate, and low distress. Tier 1a designation requires high distress, including current suicidal ideation, plans, or behaviors; or a PHQ-9 score of 15 or higher, and feeling intensely anxious, angry, hopeless, desperate or out of control “a lot of the time” or “most of the time,” or feeling nervous or worrying a lot, becoming easily annoyed or irritable, feeling life is too stressful, having arguments or fights, or feeling intensely lonely “most or all of the time.” Tier 1b requires high distress without current suicidal ideation, plans, or behaviors; and a PHQ-9 score of 10 to 14; or prior suicide attempts; or problems related to alcohol or drug use; or distressing eating behavior; or indications that the current problems make it difficult to function. Tier 2 requires moderate distress without current suicidal ideation, plans, or behaviors, or prior suicide, attempts; or a PHQ score of 10 to 14; or problems associated with alcohol or drug use; or problematic eating behaviors; or indications that current problems make it “somewhat difficult” to function. Tier 3 indicates minimal to no distress.

Program guidelines call for all Tier 1 participants contracted to be answered by a dedicated program counselor within 24 hours, Tier 2 participants within 36 hours, and Tier 3 participants within 48 hours. Within the appropriate time frame, program counselors review the participants’ questionnaires and create a detailed, personalized response and assessment for each participant, using a template specific to the participant’s distress tier, which encourages interaction between participant and counselor. After the counselors post their responses to the ISP platform, the responses are accessible to participants by logging back onto the program platform with the user ID and password they created to take the questionnaire. Participants who provide an e-mail address automatically receive an e-mail notification alerting them of the response

with a link to the program platform. Participants can also return independently to the platform and log in to view the counselor's response, regardless of having provided an e-mail address. It is worth noting that viewing the counselor's response thus requires active effort, since it is only accessible to the participant after logging back onto the platform.

In addition to the assessment, the counselor addresses any questions or comments left by participants in an open-ended comment box at the end of the questionnaire. Participants are invited to exchange dialogue messages with the counselor using the ISP platform's messaging system, or to contact the counselor directly using contact information provided by the counselor, including the counselor's name, office location and phone number. Therefore, participants maintain the ability to remain anonymous. All Tier 1 and Tier 2 participants are urged to contact the counselor to arrange an in-person meeting. All participants, regardless of tier designation, are offered the option of using the platform's "dialogue" feature to communicate online with the counselor while remaining anonymous. In general, the counselor's key aims in the responses are to convey interest, support, and availability, and to encourage engagement, whether in-person or virtual meetings, or through anonymous online dialogue.

This report includes user data from the screening questionnaire from the first 14 years of the program, May 2009 through May 2023, including 3 items on burnout that were added to the questionnaire in 2016. The current study included 5368 unique responses from medical students, pharmacy students, residents, and fellows house staff, attending physicians, nurses and nonphysician faculty, pharmacists, and other clinical and nonclinical hospital staff.

The data gathering was reviewed by the UC San Diego Institutional Review Board (IRB) and deemed not to require IRB oversight. As this study involved data-gathering via anonymous surveys, signed informed consent from participants was deemed not necessary by the IRB. Furthermore, information provided on the program platform where the screening is conducted contains the key elements of informed consent, and consent is implied by the participant's completion of the questionnaire.

Data Analysis

Descriptive statistics were first used to examine the characteristics of each position group. Next, a series of linear regression models were used to test

for position differences in 7 measures of distress (PHQ-9 score and ratings of intense anger, anxiety/anxiety attacks, loss of control, hopelessness, desperation, and anxiety) and 1 measure of functioning (the 10th item of the PHQ-9 which evaluates the impact of symptoms on functioning) and the single item assessment of burnout. Logistic regression models were employed to test for position differences on suicide risk (suicidal thoughts, plans for self-harm, Tier 1 vs. lower risk, and a composite reflecting risk on any of these 3 measures vs. none of them). A final logistic model tested for differences in the likelihood of dialoging with a counselor at least once. All models included gender, racial/ethnic background, and age as covariates. The model of dialoging with counselors also included binary covariates reflecting whether respondents were in treatment or not and whether they were identified as at risk on the risk composite or not. The initial model also included interactions between these 2 covariates and position; non-significant interactions were not retained in the final model. Significant interactions were followed by tests of simple effects to aid interpretation. In all models, physicians were the reference group compared to each of the other position groups. We conceptualized our inferential statistics as testing 4 families of outcomes (distress, functioning, risk, and dialogue with counselors), and thus performed a family-wise adjustment to set alpha at $.05/4 = .0125$.

Results

Participants

A total of 5368 participants completed the ISP questionnaire during the 14-year period, May 1, 2009, through May 31, 2023. This included 671 medical students, 280 pharmacy students, 814 residents and physician fellows, 338 attending physicians, 1172 nurses, and 2093 others (eg: pharmacists, social workers, allied health, hospital staff, and/or those who left this field blank).

Table 1 provides descriptive data for the overall sample and each position group on demographic characteristics, depressive symptom severity, burnout, intense emotional states associated with suicide risk, drinking, and eating behaviors, suicidal thoughts and risk tier, self-perceived functioning, current treatment, and engagement with program counselors after receiving written feedback.

Demographics: Except for attending physicians, most participants were under 40 years of age (attending physicians 33.1%; overall 65.6%). A

Table 1
Interactive Screening Program Data for HEAR Program: May 6, 2009 to May 31, 2023

	Total n=5368	Medical Students n=671	Pharmacy Students n=280	Residents and Fellows n=814	Attending Physicians n=338	Nurses n=1172	Other n=2093
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Demographics							
Viewed counselor's response	73.9%	80.2%	65.7%	81.9%	69.2%	71.1%	72.1%
Dialogued with counselor	27.6%	19.2%	15.7%	34.5%	26.6%	30.3%	27.8%
Age (n)	4862	622	261	731	272	1080	1896
< 40 years (%)	65.6%	99.7%	100.0%	96.9%	33.1%	59.6%	45.6%
Gender (n)	5272	666	279	805	331	1149	2042
% Female	71.5%	59.8%	74.9%	63.1%	58.3%	87.9%	71.0%
Race (n)	5368	671	280	814	338	1172	2093
White (non-Hispanic)	51.4%	41.3%	23.9%	52.1%	62.7%	59.2%	51.9%
Asian or Pacific Islander	17.3%	15.4%	47.5%	21.1%	13.6%	19.3%	12.0%
Hispanic	10.4%	6.9%	5.7%	5.3%	6.2%	7.5%	16.5%
Black or African American	2.4%	2.4%	0.4%	2.9%	0.2%	2.2%	3.0%
Multiracial	3.9%	5.1%	4.6%	3.1%	3.3%	4.8%	3.3%
Depression Severity (n)	5183	641	277	789	317	1152	2007
Moderate/Severe (PHQ-9 score >10)	39.9%	29.5%	36.8%	35.6%	24.3%	48.6%	42.7%
Burnout (n)	2998	120	133	361	192	977	1215
Feeling burned out from your work	53.9%	51.7%	40.6%	53.5%	50.5%	58.0%	53.0%
Selected Feeling States (n)	5368	671	280	814	338	1172	2093
Nervous or worrying a lot	50.7%	45.2%	56.8%	49.4%	39.9%	59.1%	48.8%
Annoyed or irritable	41.6%	28.7%	39.1%	37.8%	33.7%	52.8%	42.5%
Life too stressful	49.6%	39.0%	55.0%	50.4%	49.1%	53.8%	49.8%
Arguments or fights	14.1%	7.0%	7.9%	12.0%	12.1%	19.0%	15.5%
Intensely anxious or having anxiety attacks	25.1%	13.9%	23.6%	20.1%	12.4%	33.7%	28.1%
Intensely lonely	23.3%	21.9%	23.2%	24.7%	12.7%	28.2%	22.1%
Angry	12.7%	4.6%	8.2%	11.9%	8.3%	16.8%	14.4%
Hopeless	19.0%	13.1%	17.6%	15.2%	11.3%	23.8%	21.1%
Desperate	13.9%	10.6%	14.6%	11.8%	8.0%	17.1%	14.9%
Out of control	17.7%	14.5%	16.5%	16.9%	11.2%	22.4%	17.6%
Drinking	5368	671	280	814	338	1172	2093
Feeling like you were drinking too much	5.3%	2.7%	2.5%	2.3%	4.4%	8.6%	5.9%
Eating	5368	671	280	814	338	1172	2093
Feeling that you can't control what or how much you eat	16.9%	13.1%	15.0%	13.0%	11.2%	21.7%	18.1%
Suicidal thoughts and risk tier (n)	5368	671	280	814	338	1172	2093
Had thoughts about taking your own life?	10.0%	9.8%	8.9%	9.6%	8.0%	10.0%	10.6%
Planned ways of taking your own life?	3.7%	3.4%	5.0%	1.8%	1.8%	3.9%	4.4%
Tier 1 (high risk/distress)	49.4%	38.7%	46.4%	48.0%	39.6%	56.3%	51.5%
Function	5368	671	280	814	338	1172	2093
How difficult have any of these problems made it for you to do your work, take care of things at home, or get along with other people?	17.5%	13.4%	10.0%	15.5%	11.5%	21.8%	19.1%
Treatment							
Counseling/therapy	13.1%	14.3%	10.7%	7.1%	9.8%	15.4%	14.8%
Antidepressant/antianxiety drugs	19.5%	11.0%	10.7%	15.8%	16.6%	26.5%	21.1%

Table 1 continued

Position: “Other” includes Other Clinical (provide direct patient care or supervise people who do): 390; Other Non-Clinical (do not provide direct patient care or supervise those who do) 547; Other Non-Specified: 328; PhD Faculty 145; Other Faculty 476; Pharmacist: 35; Prefer not to answer: 172; and No Answer: 73

Gender: “Other” option includes participants that selected the “Transgender/Genderqueer or Gender Non-Conforming.”

Race/Ethnicity: “Other” option includes participants that selected “American Indian or Alaskan Native.”

Depressive Symptoms: Burnout (added January 10, 2018), **Feeling States, Drugs and Alcohol, Eating, and Function:** participants answered, “a lot of the time” or “most or all of the time.”

Suicidal Thoughts and Behaviors: participants answered, “some of the time,” “a lot of the time,” or “most or all of the time.”

Tier 1 Risk: = Either **Tier 1.a. risk:** Current suicidal ideation, plans or behaviors, or a PHQ-9 score of 15 or higher, and feeling intensely anxious, angry, hopeless, desperate or out of control “a lot of the time” or “most of the time”, or feeling nervous or worrying a lot, becoming easily annoyed or irritable, feeling life is too stressful, having arguments or fights, feeling intensely lonely “most of the time;” or **Tier 1.b. risk:** High distress without current suicidal ideation, plans or behaviors, and a PHQ 9 score of 10 to 14, or prior episodes suicide attempts, or problems related to alcohol or drug use, or eating behavior, or indications that the current problems make it difficult to function.

majority also identified themselves as “female,” (71.5%) and 51.4% as “white.”

Clinical Features: On the PHQ-9, 39.9% scored as at least moderately depressed (PHQ-9 score ≥ 10) and on the single-item burnout item, 53.9% rated themselves as burned out from work. About half of the participants endorsed feeling nervous or anxious (50.7%), 49.6% felt life was too stressful, and 19% felt hopeless. Fewer, 5.3%, believed they were drinking too much, while 16.9% could not control their weight or how much they ate, 10% had thoughts of suicide, 3.7% endorsed planning ways of taking their own lives and, 17.5% felt at least 1 of these problems had made it difficult for them to do their work, take care of things at home, or get along with other people.

Treatment: Only 703 (13.1%) of all 5368 participants were currently receiving counseling or therapy. As

tracked by the ISP platform, 3967 (73.9%) participants who completed the questionnaire returned to the ISP platform to view the counselor’s posted response and 1482 (37.3%) of those that viewed the counselor’s response subsequently engaged in 1 or more anonymous online dialogues with the counselor. While only 58 of 814 (7.1%) residents/fellows were receiving counseling or therapy when they completed the questionnaire, over one-third of the residents/fellows, 281 (34.5%), dialogued with counselors after submitting their questionnaires.

Models of Depression

The model of PHQ-9 scores is shown in Table 2. Results indicated that, controlling for gender, age, and racial/ethnic background, medical students tended to have significantly lower PHQ-9 scores than physicians, while nurses and those in the

Table 2
Association of Age, Gender, Race/Ethnicity, and Position with PHQ-9 Scores

Variable	Coefficient (95% ci)	Std Err	t	p-value	Std Coefficient
Age					
		0.01	-10.57	<.001	-0.19
Gender (Female is reference category)					
Male	-0.95 (-1.32, -0.57)	0.19	-4.96	<.001	-0.07
Other	0.60 (-0.96, 2.17)	0.80	0.76	.449	0.01
Race/ethnicity (white, non-Hispanic is reference category)					
Asian	0.97 (0.51, 1.43)	0.23	4.14	<.001	0.06
Other non-white	0.95 (0.57, 1.33)	0.19	4.89	<.001	0.07
Position (physician is reference category) *					
Medical student	-1.50 (-2.41, -0.60)	0.46	-3.26	.001	-0.08
Pharmacy student	-0.47 (-1.52, 0.59)	0.54	-0.86	.388	-0.02
Resident or fellow	-0.03 (-0.88, 0.82)	0.43	-0.06	.948	-0.01
Nurse	2.68 (1.89, 3.46)	0.40	6.70	<.001	0.19
Other position	1.94 (1.20, 2.68)	0.38	5.13	<.001	0.16

*Adjusted for age, gender, race, and ethnicity.

other group had higher scores than physicians. Pharmacy students and residents/fellows did not differ from physicians. In terms of covariates, PHQ-9 scores were higher among female than male respondents, among both non-white groups compared to respondents who identified as white, and among younger respondents.

Models of other distress outcomes

Models of other distress outcomes produced generally similar results as depression, as summarized in Table 3. In terms of differences between position groups, medical students reported significantly lower levels of anger, anxiety/anxiety attacks, hopelessness, desperation, and loss of control compared to physicians. In contrast, nurses reported higher levels of anger, anxiety/anxiety attacks, nervousness, hopelessness, desperation, and loss of control. With regards to covariates, respondents who identified as female reported significantly higher levels of anxiety/anxiety attacks and nervousness compared to respondents who identified as male. Higher distress was significantly associated with identifying as non-white and with younger age. Similarly, compared with physicians, nurses reported significantly greater difficulty functioning, and medical and pharmacy students

reported significantly less. Women reported greater difficulty functioning than men, and difficulty was inversely associated with age. In contrast, higher burnout was significantly associated only with younger age, and with being a physician relative to being a pharmacy student.

Models of suicide risk

The next series of models used logistic regression to test for position differences in measures of risk; the model evaluating the likelihood of a positive score on any risk measure is shown in Table 4. Results indicated that medical students were 43% less likely than physicians, and nurses 83% more likely than physicians to be classified as at risk. Other position groups did not differ from physicians. Respondents who identified as female or non-white, and younger respondents, were also significantly more likely to be at risk. The only other risk outcome for which significant position differences were found was tier classification, where medical students were 47% less likely and nurses 65% more likely to be classified as Tier 1, both compared with physicians. Tier 1 classification was 18% less likely for those identifying as male vs. female, and 40-41% more likely for those identifying as Asian or other non-white versus white. Tier 1 was also more

Table 3
Summary of Standardized Regression Coefficients from Other Models of Distress and Functioning Outcomes

Models of distress outcomes								
Variable	Anger	Anxiety/ Anxiety Attacks	Nervous	Out of Control	Hopelessness	Desperation	Difficulty Functioning	Burnout
Gender (Female is reference category)								
Male	0.01	-0.09**	-0.11**	-0.02	0.01	0.02	-0.05**	-0.03
Other	0.01	-0.01	-0.01	0.01	0.02	0.02	0.01	-0.02
Race/ethnicity (white, non-Hispanic is reference category)								
Asian	0.09**	0.04*	0.02	0.09**	0.10**	0.10**	-0.01	-0.02
Other non-white	0.09**	0.08**	0.05**	0.06**	0.09**	0.12**	0.02	0.02
Age								
	-0.08**	-0.16**	-0.16**	-0.14**	-0.13**	-0.11**	-0.17**	-0.08**
Position (physician is reference category)								
Medical student	-0.13**	-0.10**	-0.06	-0.08*	-0.10**	-0.09*	-0.08*	-0.03
Pharmacy student	-0.06*	-0.01	-0.01	-0.03	-0.04	-0.04	-0.06*	-0.07*
Resident or fellow	-0.01	-0.02	-0.01	0.03	-0.03	-0.04	-0.03	-0.01
Nurse	0.11**	0.16**	0.08*	0.11**	0.08*	0.07*	0.10**	0.06
Other position	0.06	0.13**	0.04	0.06	0.07	0.06	0.06	0.02

Note: Statistics are standardized regression coefficients. * $p < .0125$. ** $p < .001$.

likely for younger participants. There were no differences between position groups in terms of the likelihood of suicidal thoughts or plans. The likelihood of suicidal thoughts and plans were each associated with identifying as male. Suicidal thoughts were more common among younger respondents, whereas suicidal plans were more common among those who identified as Asian versus non-Hispanic white.

Models of dialoguing with counselors and mental health treatment

Finally, we used logistic regression to model the associations of position, treatment status, risk status, and their interactions with the likelihood of dialoguing with program counselors after receiving feedback (Table 5). Interaction terms involving the position variable were not significant and were not retained, but there was a significant treatment status * risk status interaction. The model indicated some significant differences between position groups, namely that medical students were 61% less likely and pharmacy students 71% less

likely than physicians to dialogue with counselors, after adjusting for demographics and risk and treatment statuses. There was also a significant inverse association with age, such that each additional year of age was associated with a 1% greater likelihood of dialoguing. To aid interpretation of the treatment status * risk status interaction, we conducted simple effects tests by removing the interaction term and the treatment status variable and re-fitting the model for those in treatment and not in treatment separately. Both models were comparable to the main model in terms of associations between dialog likelihood and demographic and position variables, but the strength of the association with risk status differed. For respondents who were not currently in treatment, being classified as at risk was associated with 213% greater odds of dialoguing with a counselor [Odds Ratio (OR) = 2.13 (95% confidence interval 1.80, 2.53), $p < .001$]. For those in treatment, those classified as at risk were not significantly more likely to dialogue with a counselor than those not at risk [OR = 1.30 (1.05, 1.62), $p = .017$].

Table 4
Binary Logistic Regression Model of Likelihood of Being at Risk

Variable	Odds Ratio	95% ci	Std Err	p-value
Gender (Female is reference category)				
Male	0.80	0.70, 0.91	0.05	.001
Other	1.42	0.79, 2.55	0.43	.246
Race/ethnicity (white, non-Hispanic is reference category)				
Asian	1.37	1.16, 1.61	0.11	<.001
Other non-white	1.37	1.20, 1.57	0.10	<.001
Age				
	0.98	0.97, 0.98	0.01	<.001
Position (physician is reference category)				
Medical student	0.57	0.41, 0.79	0.09	.001
Pharmacy student	0.74	0.51, 1.08	0.14	.116
Resident or fellow	1.00	0.74, 1.35	0.15	.992
Nurse	1.83	1.38, 2.42	0.26	<.001
Other position	1.50	1.15, 1.95	0.20	.003

Note: ci = confidence interval.

Risk = Suicidal thoughts, plans for self-harm, Tier 1 vs. lower risk, and a composite reflecting risk on any of these 3 measures vs. none of them).

Tier 1 included either **Tier 1.a. risk** – Current suicidal ideation, plans or behaviors, or a PHQ-9 score of 15 or higher, and feeling intensely anxious, angry, hopeless, desperate or out of control “a lot of the time,” or “most of the time,” or feeling nervous or worrying a lot, becoming easily annoyed or irritable, feeling life is too stressful, having arguments or fights, feeling intensely lonely “most of the time;” or **Tier 1.b. risk** – High distress without current suicidal ideation, plans or behaviors, and a PHQ 9 score of 10 to 14, or prior episodes suicide attempts, or problems related to alcohol or drug use, or eating behavior, or indications that the current problems make it difficult to function.

Referrals

Overall, over the 14-year period, 1681 individuals who were not currently receiving mental health counseling or therapy accepted referrals to mental health providers (UCSD's total health system population is approximately 14000). Of these, 941 came directly from the ISP and 740 were provided by the program counselors after other requests for referrals, such as individuals requesting referrals by phone or e-mail, after group debriefs, or during one-to-one "check-ins" (Supplementary Table 1).

Worries

Supplementary Table 2 provides the numbers and percentages of concerns endorsed by participants from each group. The most common concerns were about burning out (74.0%), mental health (64.9%), family life (64.1%), physical health (63.3%), and fatigue (61.0%). There was modest variation in frequencies and rank ordering of concerns between groups. A distinct majority of medical and pharmacy students worried about academic performance (86.6% and 91.1% respectively) and of matching

into their preferred specialties (59.9% and 61.5% respectively). The majority of all respondents, 55.8%, felt there were adequate mental health and wellbeing resources available, especially the medical (72.6%) and pharmacy (70.4%) students.

Discussion

This report describes the activities and outcomes of the UC San Diego HEAR program's utilization of the AFSP's ISP from its inception in May 2009 through April 2023. HEAR was designed and implemented primarily for physician suicide prevention between 2009 and 2015. In 2016, when expanded for use by the entire health organization, results demonstrated that the ISP's screening, engaging, and referring activities were embraced by physicians and non-physicians alike. The unattended high distress levels throughout the health training and healthcare workforce demonstrated the need for safe screening and referral, and the level of engagement and referrals generated by the ISP attested to its effectiveness.

The participant categories added in 2016—nurses

Table 5
Binary Logistic Regression Model of Likelihood of Dialoging with a Counselor

Variable	Odds Ratio	95% ci	Std Err	p-value
Gender (Female is reference category)				
Male	0.96	0.83, 1.12	0.07	.636
Other	0.69	0.37, 1.32	0.23	.264
Race/ethnicity (white, non-Hispanic is reference category)				
Asian	0.94	0.78, 1.13	0.09	.505
Other non-white	1.03	0.88, 1.19	0.08	.745
Age				
	0.99	0.98, 0.99	0.01	<.001
Position (physician is reference category)				
Medical student	0.39	0.27, 0.56	0.07	<.001
Pharmacy student	0.29	0.18, 0.46	0.07	<.001
Resident or fellow	0.89	0.64, 1.22	0.15	.462
Nurse	0.75	0.55, 1.01	0.11	.056
Other position	0.75	0.56, 0.99	0.11	.043
Risk Status				
	2.17	1.83, 2.57	0.19	<.001
Treatment Status				
	1.45	1.17, 1.80	0.16	.001
Risk * Treatment				
	0.59	0.45, 0.77	0.08	<.001

Note: ci = confidence interval. Risk status was coded as 0 = not at risk, 1= at risk. Treatment status was coded as 0 = not in treatment, 1 = in treatment.

and other nonphysician healthcare staff—account for more than 50% of responses. That these groups so eagerly embraced HEAR resources, including the ISP, was not a surprise. At our institution, nurses and other nonphysician healthcare staff far outnumber medical and physician learners, staff,

and faculty. Further, nursing is a female-dominated profession, where approximately 80% of nurses are women. In both the general population and among healthcare workers, women have higher rates of depression and suicide attempts and other markers of stress and distress than men which might also

Supplementary Table 1
Referrals to Mental Health Treatment

	Total n=5368	Medical Students n=671	Pharmacy Students n=280	Residents and Fellows n=814	Attending Physicians n=338	Nurses n=1172	Other n=2093
	n	n	n	n	n	n	n
Referrals from the ISP	941	74	11	258	98	273	227

941 of a total of 1681 (56%) of the mental health care referrals came from the ISP; 740 (44%) came from self-referrals or other sources.

Supplementary Table 2
Participant Concerns

	Total n=5368	Medical Students n=671	Pharmacy Students n=280	Residents and Fellows n=814	Attending Physicians n=338	Nurses n=1172	Other n=2093
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Do you feel that there are adequate mental health and/or wellbeing resources available to you at UCSD?	3871	234	196	491	264	1134	1552
	55.8%	72.6%	70.4%	60.9%	56.8%	50.5%	53.5%
I worry about...	3062	121	135	372	215	980	1239
Academic performance	30.8%	86.8%	91.1%	59.1%	43.3%	15.1%	20.5%
Burning out	74.0%	85.1%	80.0%	78.5%	74.0%	76.4%	69.1%
Family life	64.1%	48.8%	63.7%	66.7%	63.3%	66.9%	62.7%
Fatigue	61.0%	66.1%	58.5%	65.6%	46.0%	63.7%	59.8%
Matching into my preferred specialty	15.6%	59.5%	61.5%	11.6%	0.9%	15.4%	10.3%
Mental health	64.9%	75.2%	73.3%	74.7%	49.8%	66.7%	61.3%
Physical health	63.3%	62.8%	70.4%	65.1%	46.5%	66.4%	62.6%
Social life	45.6%	67.8%	66.7%	50.8%	35.3%	45.3%	45.6%
Stigma for seeking mental health services	22.1%	23.1%	14.1%	30.4%	24.2%	21.7%	20.4%
Student debt	24.5%	43.0%	68.9%	31.7%	13.5%	21.9%	19.7%

help explain the disproportionate use of the HEAR program among females,^{22, 23} and hence among nurses and other staff added in 2016. The overall increase in the ISP's utilization after 2016 likely extends beyond the addition of nurses and other staff, but also include an increase in program staffing after 2016 (from 1 to 2 and then 2.5 FTE program counselors), increased recognition and visibility of the program, and the increased stress, burnout and depression accompanying COVID.²³

Although in any given year the number of potential respondents completing the ISP was never greater than about 1 out of 4, and usually much lower,^{11,14-18} the numbers added up over time, reaching well over 5000 individuals, including almost 1000 medical and pharmacy students, over 1000 residents/fellows and attending physicians, and more than 1000 nurses. That so many of the respondents

THE PARTICIPANT CATEGORIES ADDED IN 2016—NURSES AND OTHER NONPHYSICIAN HEALTHCARE STAFF—ACCOUNT FOR MORE THAN 50% OF RESPONSES.

were in the Tier 1 high risk group, 2652/5368 (49.4%) suggests the ISP preferentially reaches its target group, those in need of further emotional support and mental health care. And that so many received and accepted mental health referrals, 1681 during this 14-year period, more than half of whom came directly from the ISP, supports the utility of such a program. These findings confirm and expand a previous report from Mortali and Moutier that described the implementation of ISP from 6 medical schools over a 7-year period (2007–2013).¹² Their study included 1449 medical students, residents, and faculty physicians. The current study adds pharmacy students, nurses, and other healthcare workers. In both studies, most respondents were designated as having moderate or high distress, and only a small minority were receiving any type of counseling or therapy. Also, in both studies, the ISP was found to help identify, engage “at risk” individuals and facilitate mental health care referrals.

Despite the considerable mental health distress experienced by physicians, **nurses** experience even more distress across several indicators. Even after adjusting for gender and other demographic features, they were **more** likely to score in the

moderate to higher depression level on the PHQ-9, to experience each of the painful emotional states that have been associated with suicide risk and were more likely to be rated as “high-risk.” This is consistent with reports of nurses, more so than physicians, to die by suicide compared to non-nurse and non-physician counterparts.⁷ It also suggests the critical importance of paying more individual and institutional attention to nurses’ unique occupational stressors as a way of enhancing engagement and wellbeing of nurses working in this uniquely challenging calling.¹⁸

In contrast, even after adjusting for age and gender, we found **medical students** were **less** likely than physicians to score as moderate or greater depression, experience intense negative effects, express difficulty functioning, or be rated as “high-risk;” and **pharmacy students** were **less** likely than physicians to rate themselves as burned out. We suspect the earlier prioritization of student wellbeing and the implementation of wellness directors at the medical and pharmacy schools were at least partially responsible for these unanticipated findings. That conclusion is buttressed by the high proportion, over 70%, of medical and pharmacy students who expressed satisfaction with the availability of mental health and wellness resources at the institution.

The overall rate of “feeling like you were drinking too much” as an indicator of problematic drinking is lower than might be expected based on previous reports of alcohol abuse and dependence in healthcare workers,²⁴ but this report uses a single screening item regarding participants’ own judgment rather than a validated instrument to measure alcohol misuse. In a previous HEAR study featuring alcohol use among medical students, house staff and faculty,²⁵ we reported a rate of 2.1% participants endorsing drinking “too much,” “a lot,” or “most” of the time, similar to rates provided in the present report. However, if we added those who endorsed “some of the time” the percentage rose to 18.3%, more consistent with other reports using validated measures to identify alcohol abuse and dependence.^{24, 25} In our previous study, we found those who reported “drinking too much” exhibited greater overall distress, depression, and suicidality, yet were no more likely that others to be receiving mental health care suggesting a troubling unfulfilled need for treatment in this high-risk group. That said, we were gratified to see that those who reported “drinking too much” were more likely to accept referrals, suggesting

that the HEAR program may be helping this potentially undertreated population to find much needed support.²⁵

It is difficult to locate comparable programs to help put these results in perspective. In an earlier 8-year review of the UC San Diego HEAR program¹⁴ we reported similar rates of overall distress, depression, and suicidal ideation, and that HEAR had referred 320 individuals for ongoing mental health care from May 2009 through June 2017 (196 directly from the ISP and 124 by other HEAR mechanisms), but at that time the number of non-physicians participating in the ISP was negligible and burnout was not being measured. A subsequent HEAR study found increases in untreated burnout, depression and intense negative feeling states in the 2-years after COVID-19 compared to the 2-years before COVID-19.²⁶ UC Davis published a report of their implementation of the ISP 2013/2014 for residents, fellows and faculty physicians.²⁷ They reported 37% of respondents at high risk (Tier 1), and that 11% (17 individuals) were referred for further mental health treatment or evaluation. These numbers were quite similar to what we report in this study for the comparable groups. Finally, in their 2007-2013 review of various programs' implementation of the ISP, Mortality and Moutier also reported that most respondents were designated as having moderate or high distress.¹² In contrast to the current report, Mortality and Moutier reported **higher** rates of distress among medical students and residents versus faculty physicians,¹² but that study period predated the increased attention to burnout and mental distress in most medical schools and institutions,²⁸ and did not control for age or gender, both of which are associated with burnout, depression and suicide risk. The importance of adjusting for demographic features cannot be overstated.

The rate of program engagement in the Mortali and Moutier study was comparable to ours, with the majority in both studies reviewing the counselors' responses, especially among those most distressed. The earlier HEAR study, UC Davis study, and the Mortali and Moutier studies all demonstrated the ISP as a feasible tool for engaging at-risk medical students, residents and physicians who were not currently utilizing mental health services. Our current study confirms those results and adds nurses and other clinical and non-clinical staff to the groups benefiting from this screening, engagement, and referral program.

The low rates of mental health treatment prior to engaging in the ISP is concerning. It parallels the low rates mental health treatment found in other reports on medical students and physicians using the IPS,^{12, 27} as well as those found in longitudinal studies of physicians in training²⁹ and in epidemiological studies of the general population.³⁰ Others

ALTHOUGH IN ANY GIVEN YEAR THE NUMBER OF POTENTIAL RESPONDENTS COMPLETING THE ISP WAS NEVER GREATER THAN ABOUT 1 OUT OF 4, AND USUALLY MUCH LOWER, THE NUMBERS ADDED UP OVER TIME, REACHING WELL OVER 5000 INDIVIDUALS.

have noted that healthcare practitioners are likely to suffer in silence, largely due to their perceived stigma associated with experiencing "stress" and "mental illness" as well as fear of getting their medical license withdrawn.^{31, 32} The ISP, especially when supported by other educational and support measures, may be a way forward.

This study adds to previous findings that when proactive, anonymous, screening and outreach is made available to healthcare students, trainees, faculty and staff, enhanced help-seeking behavior may be the result.^{12, 27} It was gratifying to see engagement with HEAR counselors was highest in those most distressed who were not already in treatment. This provides an opportunity that could be lifesaving for those most in need. The ISP is one cost effective approach that facilitates that welcome outcome.

Limitations

The study sample may not be representative of the UC San Diego population, nor the larger population of healthcare students, trainees, providers, and staff. We do not know whether respondents differed in any systematic way from those who chose not to participate. Thus, we cannot generalize the results to other students, trainees, or healthcare workers at UC San Diego, or at other institutions. Unfortunately, we were unable to compare this sample to the overall UC San Diego Health population which would help uncover any skewed representation. The data is entirely self-reported without any way of knowing how accurately respondents answered

items. The single item, self-defined burnout measure may have underestimated burnout relative to a more nuanced burnout measure, such as the Maslach Burnout Inventory.³³ Most of the outcome data do not come from non-validated measures; thus, findings should be interpreted with caution.

Still, the ISP was not designed as a research tool. Rather, it is a screening and engagement program created to facilitate mental health treatment for those in need. The use of this confidential, anonymous screening instrument along with the critical component of dialogue, engagement, support, and the use of motivational interviewing-style techniques by ISP counselors seems to be working. We conceptualize this approach as a vital component in the broader context of the emerging Workplace Suicide Prevention efforts, which have growing evidence and traction across numerous industries.³⁴

Conclusion

In this summary of the HEAR Program's impact over a 14-year period in an academic medical center comprised of over 10000 faculty, staff, and trainees in any given year, over 5000 individuals engaged in ISP screening and 1482 dialoged with program counselors. Notable findings in this voluntary, self-selecting group of physicians, nurses, trainees and staff included ~40% experiencing depression symptoms, ~50% symptoms of burnout, ~10% suicidal ideation, with medical students surprisingly experiencing clinically meaningful depression symptoms less frequently than physicians in practice, females more than males and nurses at almost 3 times the rate of physicians. Suicide risk was indicated by multiple domains of distress, and almost half of all participants were in the highest risk tier. All groups frequently engaged with the program counselors and an appreciable number, almost 1000 individuals, accepted referrals to mental health providers as part of the ISP process.

This 14-year history on 1 health system's implementation of the AFSP's ISP supports its feasibility and effectiveness. The ISP is an evidence-based, innovative program that has been widely adopted across institutions of higher education, medical and professional degree schools, organizations, and workplaces and has connected over 280000 people to professional support.³⁵ The ISP has received recognition and endorsement from various organizations. It is listed by the Accreditation Council for Graduate Medical

Education's Tools and Resources for Physician Well-Being,³⁶ as a recommended program in the American Hospital Association's report, Suicide Prevention: Evidence-Informed Interventions for the Health Care Workforce³⁷ and in the US Surgeon General's report, Addressing Health Worker Burnout: The US Surgeon General's Advisory on Building a Thriving Health Workforce.³⁸ We are delighted to be part of this long overdue national conversation on addressing healthcare workers' suicide prevention, mental health and wellness.

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