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### Authors

Horwitz, Adam G  
Hong, Victor  
Eisenberg, Daniel  
[et al.](#)

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## Engagement with Personalized Feedback for Emotional Distress among College Students at Elevated Suicide Risk

Adam G. Horwitz<sup>a</sup>, Victor Hong<sup>a</sup>, Daniel Eisenberg<sup>b</sup>, Kai Zheng<sup>c</sup>, Ronald Albucher<sup>d</sup>, William Coryell<sup>e</sup>, Jacqueline Pistorello<sup>f</sup>, Todd Favorite<sup>a</sup>, Cheryl A. King<sup>a</sup>

<sup>a</sup>University of Michigan Medical School, Department of Psychiatry, 4250 Plymouth Rd., Ann Arbor, MI 48105, USA

<sup>b</sup>University of California, Los Angeles, School of Public Health, 650 Charles E Young Dr S, Los Angeles, CA 90095, USA

<sup>c</sup>University of California, Irvine, Department of Informatics, 5019 Donald Bren Hall, Irvine, CA 92697, USA

<sup>d</sup>Stanford University, Counseling and Psychological Services, 866 Campus Dr., Stanford, CA 94305, USA

<sup>e</sup>University of Iowa, Department of Psychiatry, 200 Hawkins Drive, Iowa City, IA 52242, USA

<sup>f</sup>University of Nevada, Reno, Counseling Services, 1664 N Virginia St, Reno, NV 89557, USA

### Abstract

Depression and suicidal ideation have substantially increased among college students, yet many students with clinically significant symptoms do not perceive their distress as warranting mental health services. Personalized feedback (PF) interventions deliver objective data, often electronically, comparing an individual's reported symptoms or behaviors to a group norm. Several studies have shown promise for PF interventions in the context of mood and depression, yet little is known regarding how, and for whom, mood-focused PF interventions might be best deployed. The primary aim of this study was to examine the sociodemographic, clinical, and treatment-seeking factors associated with reviewing PF reports on emotional distress among college students ( $N=1,673$ ) screening positive for elevated suicide risk and not receiving mental health treatment. Results indicated that PF engagement was greatest among those with higher depression scores, and those reporting privacy/stigma concerns as barriers to treatment. Sexual minority students were more likely to review their PF than heterosexual students. Taken together, PF interventions may be a useful tool for engaging those with greater clinical acuity, and those hesitant to seek in-person care. Further research is warranted to examine the circumstances in which PF interventions might be used in isolation, or as part of a multi-tiered intervention strategy.

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Correspondence concerning this article should be addressed to Adam G. Horwitz, Ph.D., 4250 Plymouth Rd., Ann Arbor, MI, 48109. Phone: 734-232-0519. Fax: 734-615-8739. ahor@umich.edu.

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## Keywords

personalized feedback; depression; mood; college students; suicide; intervention

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Depression is the leading cause of disease-related disability worldwide (World Health Organization, 2017) and 12% of young adults in the United States will meet criteria for major depression in a given year (Hasin et al., 2018). Depression during young adulthood has severe long-term negative impacts on physical health and social functioning (e.g., Blaine, 2008; Franko et al., 2005; Wickrama et al., 2009), academic performance (e.g., Bruffaerts et al., 2018), and risk for dropping out of college (e.g., Auerbach et al., 2016). Furthermore, depression is often present among those who think about or attempt suicide (e.g., Cavanagh et al., 2003; Hawton et al., 2013), and suicide is the second leading cause of death among young adults nationally (Centers for Disease Control and Prevention, 2020).

The risks associated with depression, suicidal thoughts, and suicidal behaviors are especially concerning among college students, where the lifetime prevalence of mental health diagnosis has increased from 22% to 36% and past-year suicidal ideation has increased from 5.8% to 10.8% from 2007 to 2017 (Lipson et al., 2018). Stress is a key predictor of mental health problems and suicidal behaviors (e.g., Liu et al., 2019) and college students experience significant transitional stress associated with new living situations, academic expectations, and interpersonal relationships (Byrd & McKinney, 2012). The typical age of onset for mood disorders is late adolescence and early adulthood (de Girolamo et al., 2012) and early intervention can mitigate the risk for future episodes (Allen et al., 2007). Unfortunately, college counseling centers are overwhelmed by growing demands for mental health services and struggle with long waitlists and insufficient staffing (e.g., Xiao et al., 2017). As a result, many students in need do not receive care (Auerbach et al., 2016).

In light of the overwhelming demand for services on college campuses, many institutions have initiated technology-enabled mental health programs to expand their reach (Lattie et al., 2019). However, while access to services may be a barrier among those interested in seeking treatment, there are also internal barriers that limit help-seeking, even among those with significant symptoms (Sareen et al., 2007). College students at elevated risk for suicide frequently cite a low perceived need for care, a preference for self-management, lack of time, and to a lesser extent, concerns about privacy or stigma (Cyz et al., 2013; Horwitz, McGuire, et al., 2020). Technology-based mental health programs offer opportunities to deliver interventions directly to individuals, significantly reducing engagement barriers related to limited time, finances, or stigma about being seen in a clinic. Yet, high dropout rates and low utilization of mobile and web-based treatments present significant challenges to behavioral intervention technologies (Mohr et al., 2013), and suggest that low-burden approaches may be needed to increase engagement.

Personalized feedback (PF) interventions include the delivery of objective data regarding an individual's reported behavior or symptoms, often electronically, in comparison to a group norm. PF is theorized to be effective in motivating behavioral changes by increasing problem recognition and identifying inconsistencies between current behaviors and both normative and personal standards (e.g., Collins et al., 2002). PF interventions were initially

developed for college-student drinking, and studies have consistently demonstrated that single assessments, followed by PF about perceived and actual drinking norms, significantly reduces drinking behaviors (e.g., Larimer et al., 2007; Neighbors et al., 2004; Riper et al., 2009). These findings for PF interventions have been extended for other behavioral health issues, such as problem gambling (e.g., Marchica & Derevensky, 2016; Neighbors et al., 2015) and weight management (e.g., Sherrington et al., 2016). However, the potential utility of PF for depression has received only limited attention, with a study by Geisner et al. (2006) demonstrating a reduction in depressive symptoms at a one-month follow-up for college students who were mailed PF regarding their mood, and PF messages derived from daily mood reports demonstrating positive effects on next-day mood for medical interns (NeCamp et al., 2020).

Since PF interventions are brief and require little active participation, they are well-suited for large-scale universal or indicated prevention strategies. While effect sizes for stand-alone PF interventions tend to be small (e.g., Riper et al., 2009), PF is frequently used as a starting point for other interventions, such as motivational interviewing (King, Gipson, et al., 2015; Monti et al., 2007; Vader et al., 2010) to facilitate behavioral changes leading to better health outcomes. One such example is the Electronic Bridge to Mental Health Services (eBridge; King, Eisenberg, et al., 2015) intervention for college students, which includes online suicide risk screening, an option to review PF reports, and an opportunity to discuss their PF or other concerns with an online counselor trained in motivational interviewing. In a pilot randomized controlled trial (RCT), eBridge was associated with a higher likelihood of linking to mental health services, suggesting its promise and the potential of PF interventions to serve as a facilitative component of a stepped-care approach.

Given the limited burden and ease of access, electronically-delivered PF interventions have the potential to overcome external barriers to care (e.g., lack of time, finances) and target common internal barriers to care, such as low perceived need for treatment, through corrective normative feedback. Participation in online and mobile interventions tends to be transient (e.g., Torous et al., 2020), so the development of PF interventions would be greatly enhanced with an improved understanding of the conditions in which, and populations for whom, engagement with PF is greatest. Our study objective was to examine the sociodemographic (e.g., race/ethnicity, gender), clinical (e.g., depression, suicidal ideation), and treatment-seeking (e.g., barriers, readiness) factors associated with reviewing PF reports on emotional distress (i.e., depression, suicidal ideation, suicide attempts) among college students participating in a full-scale RCT examining the effectiveness of the eBridge intervention in linking students at elevated suicide risk, and not receiving treatment, to mental health services (King et al., 2021). To our knowledge, this is the first analysis to examine the correlates of viewing PF for depression, and findings have the potential to inform more targeted approaches for PF interventions with college students.

## Method

### Participants

Participants were 1,673 college students who were randomly assigned to the intervention condition of the eBridge clinical trial, which was conducted at a geographically diverse

set of four US universities. Based on the trial's eligibility criteria, these students screened positive for elevated suicide risk (see Measures) and were not receiving any mental health services at the beginning of the trial. The present study sample's gender distribution was as follows: 62.3% woman, 34.7% man, and 3.0% as transgender or genderqueer. The sample was categorized as 18-year-old undergraduate students (39%), undergraduate students ages 19-22 (31.4%), and 29.6% graduate/professional students or older (23+) undergraduates. Racial/ethnic distribution was as follows: 58.1% Caucasian, 20.1% Asian, 11.2% Hispanic, 7.4% Black, 3.2% Other Race. Sexual orientations included: 58.0% heterosexual; 15.5% bisexual or pansexual; 13.7% mostly heterosexual; 5.6% gay or lesbian; and 7.1% other sexual minority.

## Measures

**Demographics.**—Participants reported their age, gender identity, race/ethnicity, and sexual orientation. They were able to 'check all that apply' from a wide range of gender identity, race/ethnicity, and sexual orientation options. Responses were categorized into mutually exclusive categories for analyses, consistent with previous manuscripts utilizing this sample (e.g., Horwitz, Berona, et al., 2020). For gender identity, these included: cisgender man, cisgender woman, transgender or genderqueer. For race/ethnicity, these included: non-Hispanic White, Black, Hispanic, Asian, and Other. For sexuality, these included: heterosexual, mostly heterosexual, gay/lesbian, bisexual/pansexual, and other sexual minority. Degree program was collected from the Office of the Registrar at the participating Universities.

**Screen for Elevated Suicide Risk.**—Participants were eligible for the study if they screened positive for at least two of four (depression, alcohol use, suicidal ideation, suicide attempt) suicide risk factors.

**Depression.** The Patient Health Questionnaire-2 (PHQ-2; Kroenke et al., 2003) is a two-item screener for depression that assesses anhedonia and low mood on a 4-point Likert scale. Previous studies have identified an optimal cut-off score of 3 (Löwe et al., 2005), which was used to indicate a positive depression screen. The remaining items making up the full-length Patient Health Questionnaire-9 (PHQ-9; Kroenke et al., 2001) were administered to the intervention-eligible participants, and were used to assess frequency of all nine DSM-V depression symptoms over the past two weeks (range: 0-27). Internal consistency for the PHQ-9 in this sample was  $\alpha = .83$ .

**Alcohol Use.** The Alcohol Use Disorders Identification Test (AUDIT; Saunders et al., 1993) is a 10-item scale that assesses frequency, quantity, and negative consequences associated with alcohol use. The AUDIT has been used to detect high risk drinking in college students with a recommended cutoff of 6-8 (Kokotailo et al., 2004); a cutoff of 8 was used for positive screens. Internal consistency for the AUDIT in this sample was  $\alpha = .84$ .

**Suicidal Ideation.** Items from the National Comorbidity Survey (Kessler et al., 2004) were used to assess suicidal ideation. Affirmative responses to, "In the past 12 months, has there ever been a period of 2 weeks or more when you felt like you wanted to die?"

or “In the past 12 months, have you ever felt so low that you thought about committing suicide?” were considered a positive screen for suicidal ideation, and prompted a follow-up question regarding presence of such thoughts in the past month. Additionally, a non-zero response to the ninth item of the PHQ-9, “Over the last two weeks, how often have you been bothered by thoughts you would be better off dead or of hurting yourself in some way?” was considered a positive screen for suicidal ideation. In the study analyses, we utilized the more conservative “you felt so low that you thought about committing suicide” item to indicate past-year and past month suicidal ideation.

**Suicide Attempt.:** A positive screen for suicide attempt was defined by an affirmative response to the National Comorbidity Survey (Kessler et al., 2004) question, “In your lifetime have you ever attempted suicide?” Those responding affirmatively received follow up questions regarding number of past attempts and whether any attempts occurred within the past year.

**Mental health service use.**—Participants were asked to indicate whether they had taken any psychotropic medications prescribed from a health professional in the past year, and whether they had received any counseling or therapy for mental or emotional health from a health professional in the past year. Those who indicated “yes” to either question were asked if they were currently receiving those services, and were excluded from the trial if they indicated “yes” to currently taking medications or receiving counseling/therapy.

**Barriers to service use.**—Participants were prompted, “In the past 12 months, which of the following factors led you to receive fewer services (counseling, therapy, or medications) for your mental or behavioral health?” Participants checked all that applied from a list of 24 barriers derived from a previous web-based survey of college students (Downs & Eisenberg, 2012) that included a range of different attitudes, beliefs, and experiences that may have resulted in lack of service utilization. Barriers were categorized in line with previous research utilizing this measure (Busby et al., 2019; Horwitz, McGuire, et al., 2020) and grouped into the following categories: low perceived need for professional treatment, lack of time, worries about privacy or stigma, lack of financial resources, doubts about the usefulness of treatment, logistical barriers to treatment access, and concerns about lack of cultural sensitivity.

**Readiness for Help-Seeking.**—Participants indicated their readiness to engage in specific help-seeking behaviors, including: seeking information about mental health services from websites or other sources; talking to family members about seeking help from a professional; talking to friends or other non-family member about seeking professional help; and seeking help from a mental health professional. These behaviors were ranked on a 0-10-point readiness scale, with anchors including: “Sometimes I think about doing this” (3); I have taken steps toward doing this” (7); and “I already did this” (10). This scale was adapted from a readiness to change scale originally developed by Labrie et al. (2005) and utilized in the e-Bridge pilot study (King, Eisenberg, et al., 2015).

**Feedback Engagement.**—Usage data from the study server provided information regarding view counts of the personalized feedback reports of emotional distress, which

required a voluntary ‘click’ from the homepage once the baseline survey was completed. Students were categorized for feedback engagement based on having no views, a single view, or multiple views [Mean(SD) = 2.36 (0.82)] of their PF report.

## Procedures

Institutional Review Board approvals were obtained at all four participating universities. Students were invited by e-mail (obtained from registrar databases) to participate in a confidential, online wellness screen 3-4 weeks into the fall semesters from 2015 to 2018, and were informed that some students would be invited to participate in a second phase of the study. Eligibility criteria for study screening included age 18 or above, enrollment in a degree-seeking program, and residing domestically (e.g., not studying abroad). Of the 178,879 invitations sent, 40,334 (22.5%) consented and completed the full screen. Elevated suicide risk criteria (at least two of four positive screens among: depression, alcohol use, suicidal ideation, suicide attempt-see criteria above) was met by 5,790 (14.4%) of students who completed the screen. Our final analytic sample of 1,673 was attained after excluding participants currently taking psychotropic medications or seeing a health care provider for an emotional or mental health issue, and those randomized to the control condition.<sup>1</sup>

After completing the wellness screen, the 1,673 students randomized to the e-Bridge condition were taken to a homepage in which they could view personalized feedback reports on “my distress level”, “my alcohol use level”, and/or discuss their survey results confidentially with an online counselor. Links and phone numbers for local campus resources and crisis services were presented in the sidebar of the homepage for all students. The distress feedback page included a graph of their PHQ-9 score on a curve demonstrating their percentile relative to a normative sample of college students, the corresponding PHQ-9 severity category (e.g., mild, moderate, severe, etc.), a verbal statement reflecting whether they indicated suicidal ideation or suicide attempts, and a summary statement indicating their report of distress and “something to consider is figuring out what might be helpful to manage any difficulties you might be having.”

## Data Analytic Plan

Data were analyzed with SPSS version 24 and R version 4.02 with *nnet* (Ripley et al., 2016) for multinomial regression and *ggplot2* (Wickham, 2016) for the figure. Due to a wide range (1-6) in number of specific barriers in the barrier categories, we required barrier categories with 4 items or more to have at least 50% of the barrier items within that category checked to be considered ‘yes’ for that barrier category, as has been done in previous studies (e.g., Horwitz, McGuire, et al., 2020). Due to small sizes among sexuality subgroups, analyses were dichotomized to compare strictly heterosexual students to those identifying as mostly heterosexual, gay/lesbian, bisexual/pansexual, and other sexual identities.

Chi-square analyses were utilized to examine differences in categorical variables (e.g., gender, race, past-year suicide attempt) across the three personalized feedback groups. We

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<sup>1</sup>A sensitivity analysis examined the sample without 133 individuals who screened positive for depression and alcohol, but no suicidal ideation or suicide attempt, and did not identify significant differences for engagement with personalized feedback. Thus, the full sample is utilized in all analyses.



performed post-hoc testing for chi-square analyses by examining the unique contribution (i.e., standardized residual) of each cell (Beasley & Schumacker, 1995) with a significant omnibus test, with standardized residuals of 2.58 ( $p$ -value of  $< .01$ ) or greater reported as statistically significant in order to control for Type I error rate. One-way ANOVA tests examined differences between continuous variables across the three personalized feedback groups, and Bonferroni post-hoc tests examined differences within variables with significant omnibus tests. A multinomial logistic regression utilizing sociodemographic, clinical, and treatment-seeking variables with trend-level or significant univariate associations with PF groups was reduced utilizing a backward selection procedure to remove non-significant variables and Akaike Information Criterion (AIC) scores to identify the most parsimonious model. The final model includes the omnibus likelihood ratio chi-square tests for each variable, the adjusted odds ratios and 95% confidence intervals, all controlling for the variables in the final, parsimonious model.

## Results

### Descriptive Statistics and ANOVA

Of the 1,673 students in the sample, 469 (28.0%) did not view their feedback on emotional distress at all (No View “NV”), 972 (58.1%) viewed their feedback report once (Single View “SV”), and 232 (13.9%) viewed their feedback report multiple times (Multiple Views “MV”). Sociodemographic, clinical, and treatment-seeking characteristics of the sample among the different personalized feedback groups are presented in Table 1 with a series of chi-square and F-tests.

There were no significant differences between groups by gender, race, ethnicity, or sexual orientation. However, graduate/professional students were significantly less likely to be in the NV group, and 18 year-old undergraduates were significantly less likely to be in the SV group. Depression scores, incidence of past-month suicidal ideation, and incidence of past-year suicide attempts were significantly higher among those in the MV group; suicidal ideation in the past year and lifetime suicide attempt did not differ across PF groups. Those in the NV group were significantly less likely to report a low perceived need for treatment or lack of time as barriers to obtaining mental health services, whereas those in the MV group were significantly more likely to report concerns about stigma and privacy as barriers to treatment.

### Multinomial Logistic Regression

A multinomial logistic regression examined sociodemographic, clinical, and treatment-seeking variables as predictors of being in the NV, SV, and MV groups. The final model, including the omnibus likelihood ratio tests, adjusted odds ratios, and 95% confidence intervals are presented in Table 2.

Graduate/professional students had 52% greater adjusted odds ( $z = 2.95, p = .003$ ) to be in the SV group than the NV group, relative to 18-year-old undergraduates. Those identifying with a sexual minority orientation had 38% greater adjusted odds ( $z = 2.75, p = .006$ ) of being in the SV group relative to the NV group. Each additional point on the PHQ-9



depression scale was associated with a 7% increase in adjusted odds ( $z = 4.33, p < .001$ ) and 8% increase in adjusted odds ( $z = 5.35, p < .001$ ) of being in the MV group relative to the NV and SV groups, respectively. The predicted probability curves for being in the NV, SV, and MV groups as a function of age/school and depression scores are presented in Figure 1.

With respect to barriers, those reporting a low perceived need for treatment as a barrier to care had 47% greater adjusted odds of being in the SV group ( $z = 3.26, p = .001$ ) and 40% greater adjusted odds of being in the MV group ( $z = 2.01, p = .045$ ), relative to the NV group. Those reporting concerns about privacy and stigma had 49% greater adjusted odds ( $z = 2.28, p = .022$ ) and had 47% greater adjusted odds ( $z = 2.44, p = .014$ ) of being in the MV group relative to the NV and SV groups, respectively. Students reporting lack of time as a barrier to care had 33% greater adjusted odds ( $z = 2.33, p = .02$ ) of being in the SV group, relative to the NV group.

## Discussion

This secondary analysis of a multi-site online intervention study examined the degree to which college students screening positive for elevated suicide risk engage with personalized feedback (PF) reports of their depression, suicidal ideation, and suicide attempts. It is the first analysis to date of its kind in that unlike previous studies utilizing PF, and in keeping with the spirit of autonomy associated with motivational interviewing and behavior change, students were provided with the *option* to view, or not view, their PF. The majority of students (72%) who completed the survey did review their PF report at least once, with 14% of the sample reviewing their PF multiple times, and 28% opting not to view their PF.

A number of sociodemographic, clinical, and treatment-seeking factors distinguished students who did not view their PF, viewed their PF once, and viewed their PF multiple times. Those viewing their PF multiple times had significantly higher depression scores, which may reflect students with more severe symptoms having an increased interest in the details of their report. Students with multiple PF views were also more likely to report privacy and stigma concerns as barriers to treatment, and this willingness to spend more time with an online PF report supports previous research suggesting that online interventions may be a promising way to reach individuals with face-to-face treatment stigma concerns (e.g., Chan et al., 2016; Kauer et al., 2014).

Unfortunately, few factors distinguished the subgroup of students who did not view their PF, limiting inferences for ways to better engage this group. However, students who did not view their PF were significantly less likely to report a low perceived need for treatment as a barrier, which included items such as, “stress is normal during school,” “I question how serious my needs are,” and “the problem will get better by itself.” It may be that these students were aware of their mental health problems, and either wished to avoid confronting this information, or were simply not interested in PF. When controlling for depression, sexual minority students (i.e., those identifying as bisexual, gay, lesbian, etc) were significantly more likely to view their PF once than not view it, relative to heterosexual students. Given that sexual minority students are at elevated risk for suicide (e.g., Horwitz, Berona, et al., 2020) and cultural-competency issues often interfere with

receiving services (e.g., Horwitz, McGuire, et al., 2020; Wilkerson et al., 2011), this finding provides additional support for the openness of sexual minority students to online interventions (e.g., Pachankis et al., 2020; Schwinn et al., 2015).

PF interventions are low-burden, can be widely disseminated through online or mobile platforms, and have demonstrated efficacy for a number of health behaviors (e.g., Neighbors et al., 2004; Rabbi et al., 2015; Riper et al., 2009). In spite of this scalability, only a limited number of studies have investigated PF interventions for depression or mood-related help-seeking (Geisner et al., 2006; King, Eisenberg, et al., 2015). Findings from this study suggest that college students with significant mental health symptoms are generally willing to review PF reports, and those who might be more resistant to treatment (e.g., concerns about stigma/privacy) or who experience other barriers to care (e.g., sexual minority students) are comfortable spending more time engaging with this approach. In spite of the risk criteria set for the study, nearly half (49%) of all participants reported low perceived need as a reason for not seeking treatment, highlighting the opportunity for PF interventions to increase problem recognition among students at elevated risk for suicide through objective, corrective feedback. This PF regarding depression, suicidal ideation, and suicide attempts may be particularly effective in promoting help-seeking (e.g., Hom et al., 2014; King, Eisenberg, et al., 2015), which is especially needed, given that approximately 75% of individuals who die by suicide do not receive any mental health care in the year preceding their death (Walby et al., 2018). Additional research is needed to clarify how to best engage at-risk populations with PF interventions, the conditions in which PF is suitable as a stand-alone preventative intervention, and when PF is more effective as a facilitative step to encourage a more intensive treatment.

Findings from this study should be considered within the context of several limitations. Participants in this study were invited to complete the initial screening survey via e-mail (consent rate of 23%), and it is possible that those participating were more inclined to engage with online interventions by virtue of willingness to complete the screen. This could potentially contribute to an overestimation of the proportion of students in the full population willing to engage in an online PF intervention. Furthermore, while our study included students from four institutions across the United States, these sites were not nationally representative. Our screen was intended to be brief, and as such, we relied on dichotomous responses to questions about suicidal ideation and attempts, and were unable to capture levels of severity within these constructs. We were also unable to reliably assess the amount of time spent viewing PF, which may have provided a better engagement metric than number of PF report views. Importantly, our study was unable to assess the degree to which review of PF reports may have influenced outcomes related to mood or help-seeking longitudinally, as PF was one element of a multifaceted intervention, and its influence could not be reliably disentangled from other components of the intervention with regard to clinical outcomes and help-seeking.

## Conclusions

Personalized feedback (PF) is a low-burden, easily disseminated intervention that has been understudied with respect to efficacy for emotional and/or mood problems. PF has

demonstrated efficacy as a one-time intervention (e.g., Geisner et al., 2006; Larimer et al., 2007), and mobile and wearable-sensor technologies offer opportunities for enhanced PF interventions that can be delivered at regular intervals over time (e.g., NeCamp et al., 2020; Rabbi et al., 2015). A majority of students in this study, all of whom were experiencing clinically significant symptoms and were not actively receiving mental health treatment, chose to review a PF report regarding their emotional distress (i.e., depression, suicidal ideation, suicide attempts). Furthermore, those reviewing their PF multiple times were characterized by higher depression scores and greater odds of reporting concerns related to stigma and privacy as barriers to help-seeking, suggesting that PF may be a particularly useful tool for engaging those with greater symptom severity, and those who may be more hesitant to seek in-person care. Additional research is warranted to further examine the utility of PF interventions for mood-related outcomes, whether as a stand-alone intervention or as an initial component to stepped-care/multitier interventions.

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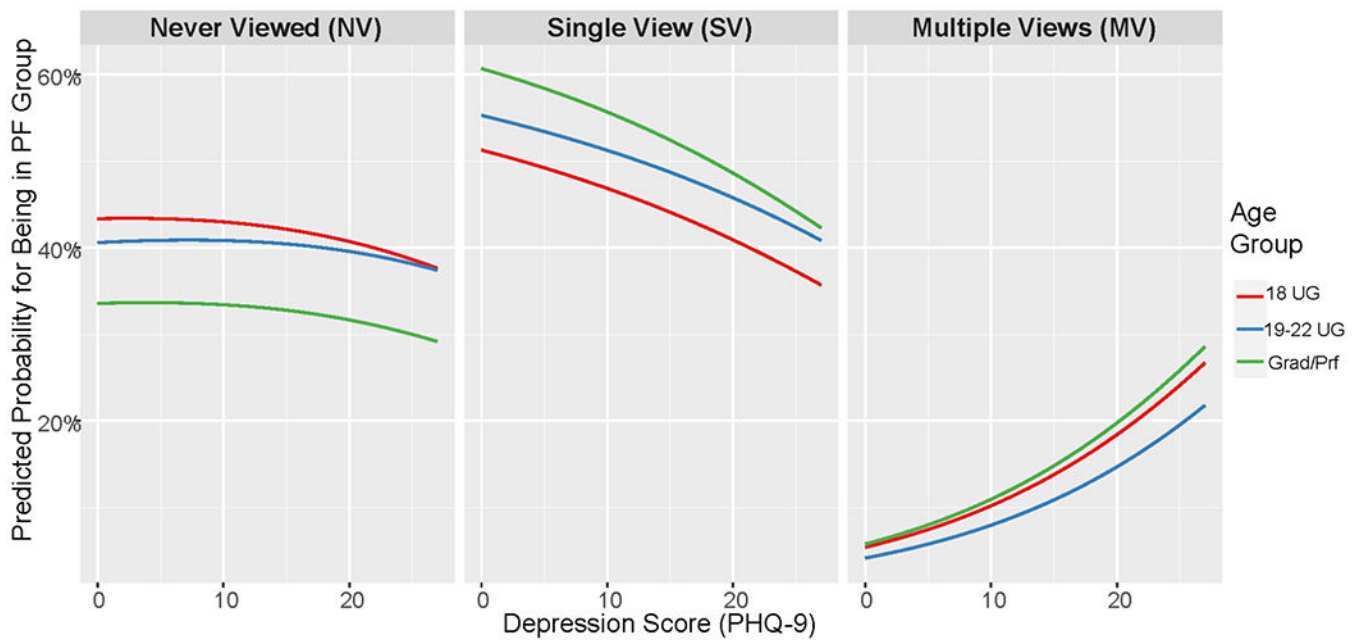
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### Highlights

- Elevated-risk students provided option to review personalized feedback (PF) report
- A majority (72%) of elevated-risk students chose to review PF at least once
- Depression severity and stigma/privacy concerns associated with multiple PF views
- Sexual minority students more likely than heterosexual students to review PF
- Students not viewing PF were less likely to report low perceived need for services





**Figure 1.** Predicted Probabilities for Personalized Feedback Groups based on Age and Depression Note. Predicted probabilities are demonstrated utilizing the most commonly reported responses for covariates in the final model (i.e., No Time (Yes), Privacy/Stigma (No), Low Perceived Need (No), Sexual Orientation (Heterosexual)). UG = Undergraduate.

Table 1

## Demographic, Clinical, and Treatment-seeking Characteristics with Feedback Group Comparisons

Characteristic	Personalized Feedback Group			Overall N=1673 (100%)	Test Statistic $\chi^2$ (df) F(2, 1670)
	Did Not View (NV) n=469 (28%)	Single View (SV) n=972 (58%)	Multiple View (MV) n=232 (14%)		
Gender					$\chi^2(4) = 1.3$
Woman	293 (28%)	600 (58%)	148 (14%)	1041 (62%)	
Man	165 (28%)	338 (58%)	77 (13%)	580 (35%)	
TGNB	11 (22%)	32 (64%)	7 (14%)	50 (3%)	
Race/Ethnicity					$\chi^2(8) = 6.5$
White	263 (27%)	579 (60%)	130 (13%)	972 (58%)	
Black	41 (33%)	69 (56%)	14 (11%)	124 (7%)	
Asian	95 (28%)	184 (55%)	57 (17%)	336 (20%)	
Hispanic	53 (28%)	111 (59%)	23 (12%)	187 (11%)	
Other Race	17 (32%)	29 (54%)	8 (15%)	54 (3%)	
Age/School					$\chi^2(4) = 11.6^*$
18 y/o UG	199 (31%)	<b>353 (54%)</b>	101 (16%)	653 (39%)	
19-22 y/o UG	153 (29%)	311 (59%)	61 (12%)	525 (31%)	
23+ UG, Grad/Prof	<b>117 (24%)</b>	308 (62%)	70 (14%)	495 (30%)	
Sexual Orientation					$\chi^2(2) = 5.7$
Heterosexual	292 (30%)	542 (56%)	130 (14%)	964 (58%)	
LGB+	177 (25%)	430 (61%)	102 (14%)	709 (42%)	
Depression [M(SD)]	12.6 (5.7)	12.5 (5.6)	<b>14.9 (5.4)<sup>a</sup></b>	12.8 (5.7)	F = 18.3 <sup>***</sup>
Past Year SI (Yes)	260 (55%)	525 (54%)	141 (61%)	926 (55%)	$\chi^2(2) = 3.5$
Past Month SI (Yes)	107 (23%)	199 (20%)	<b>67 (29%)</b>	373 (22%)	$\chi^2(2) = 7.7^*$
Lifetime SA (Yes)	127 (27%)	246 (25%)	60 (26%)	433 (26%)	$\chi^2(2) = 0.5$
Past Year SA (Yes)	21 (5%)	35 (4%)	<b>18 (8%)</b>	74 (4%)	$\chi^2(2) = 7.7^*$
Barriers					
Low Perceived Need	<b>201 (43%)</b>	<b>508 (52%)</b>	118 (51%)	827 (49%)	$\chi^2(2) = 11.4^{**}$
No Time	<b>283 (60%)</b>	665 (68%)	157 (68%)	1105 (66%)	$\chi^2(2) = 9.5^{**}$
Privacy/Stigma	135 (29%)	289 (30%)	<b>95 (41%)</b>	519 (31%)	$\chi^2(2) = 12.5^{**}$
Financial	223 (47%)	492 (51%)	125 (54%)	840 (50%)	$\chi^2(2) = 2.6$
Question helpfulness	132 (28%)	286 (29%)	85 (37%)	503 (30%)	$\chi^2(2) = 5.8$
Logistics	101 (22%)	202 (21%)	53 (23%)	356 (21%)	$\chi^2(2) = 0.5$
Cultural	52 (11%)	136 (14%)	28 (12%)	216 (13%)	$\chi^2(2) = 2.5$
Past-year MH Tx (Yes)	107 (23%)	248 (26%)	45 (20%)	400 (24%)	$\chi^2(2) = 4.3$
Readiness for help [M(SD)]					
Seek information	4.7 (3.3)	4.6 (3.4)	<b>5.3 (3.3)<sup>b</sup></b>	4.7 (3.4)	F = 3.6 <sup>*</sup>
Talk to family about MH	3.4 (3.7)	3.4 (3.7)	3.1 (3.6)	3.3 (3.6)	F = 0.4
Talk to friend about MH	4.5 (3.7)	4.3 (3.7)	4.5 (3.6)	4.4 (3.6)	F = 0.9

Characteristic	Personalized Feedback Group			Overall N=1673 (100%)	Test Statistic $\chi^2$ (df) F(2, 1670)
	Did Not View (NV) n=469 (28%)	Single View (SV) n=972 (58%)	Multiple View (MV) n=232 (14%)		
Talk to MH professional	4.4 (3.2)	4.1 (3.2)	4.2 (2.9)	4.2 (3.1)	F= 1.3

Note.

\*  
 $p < .05$

\*\*  
 $p < .01$

\*\*\*  
 $p < .001$ .

Percentages reflect column percentages except for the demographic variables, which show the row percentages (Gender, Race/Ethnicity, Age/School, and Sexual Orientation). Continuous variables report F tests for one-way ANOVAs and categorical variables report Chi-square tests. Bolded percentages indicate statistically significant post-hoc values at  $p < .01$  (i.e., standardized residuals).

TGNB = Transgender or non-binary. UG = Undergraduate. LGB+ = Lesbian, Gay, Bisexual, mostly heterosexual, or other sexual minority. SI = Suicidal Ideation. SA = Suicide Attempt. MH = Mental Health. Tx = Treatment.

<sup>a</sup>Post-hoc Bonferroni tests indicated MV > NV and SV.

<sup>b</sup>Post-hoc Bonferroni tests indicated MV > SV.

**Table 2**  
Multinomial Logistic Regression Examining Differences in Personalized Feedback Engagement

Variable	LR test	SV vs. NV AOR (95% CI)	MV vs. NV AOR (95% CI)	MV vs. SV AOR (95% CI)
Age/School	$\chi^2(4) = 12.50^*$	Reference	Reference	Reference
18 UG		1.15 (0.89, 1.42)	0.82 (0.42, 1.21)	0.71 (0.35, 1.08)
19-22 UG		<b>1.52 (1.25, 1.81)**</b>	1.38 (0.99, 1.78)	0.90 (0.55, 1.26)
Grad/Prof				
Sexual Orientation	$\chi^2(2) = 7.64^*$	Reference	Reference	Reference
Heterosexual		1.38 ( <b>1.15, 1.61</b> )**	1.24 (0.91, 1.57)	0.90 (0.60, 1.19)
LGB+				
Barriers (Ref: No)				
Low Perceived Need	$\chi^2(2) = 10.98^{**}$	<b>1.47 (1.24, 1.70)**</b>	<b>1.40 (1.07, 1.73)^*</b>	0.96 (0.65, 1.26)
Privacy/Stigma	$\chi^2(2) = 6.50^*$	1.01 (0.76, 1.27)	<b>1.49 (1.15, 1.84)^*</b>	<b>1.47 (1.16, 1.78)^*</b>
No Time	$\chi^2(2) = 5.57$	<b>1.33 (1.09, 1.57)^*</b>	1.13 (0.79, 1.48)	0.85 (0.52, 1.17)
Depression (PHQ-9)	$\chi^2(2) = 29.50^{***}$	0.99 (0.97, 1.01)	<b>1.07 (1.04, 1.10)***</b>	<b>1.08 (1.05, 1.10)***</b>

Note.

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$ .

LR test reflects adjustment for other variables included in the final model.

LR = Likelihood Ratio. NV = No Views. SV = Single View. MV = Multiple Views. AOR = Adjusted Odds Ratios. CI = Confidence Intervals. UG = Undergraduate. LGB+ = Lesbian, Gay, Bisexual, mostly heterosexual, or other sexual minority.