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Suicide risk profiles and barriers to professional help-seeking among college students with elevated risk for suicide

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Abstract

Suicide is the second leading cause of death among college students, yet many students with elevated suicide risk do not seek professional help. This study identified suicide risk profiles among college students and examined these in relation to students' perceived barriers to professional help-seeking. Data were obtained from college students (n=1,689) identified to be at elevated risk for suicide based at four US universities. Latent class analysis was performed to determine risk profiles, followed by examinations of differences in help-seeking barriers by profile groupings. Results revealed three student groupings: (1) moderate internalizing and externalizing symptoms (with low alcohol misuse), (2) highest internalizing and externalizing symptoms (with highest social disconnection), and (3) lowest internalizing symptoms and low externalizing (with highest social connection and alcohol misuse). Group 1 included the youngest and most racially and sexually diverse students, Group 2 endorsed the most help-seeking barriers, and Group 3 endorsed the fewest barriers. Group 2 is especially concerning, considering the severe clinical characteristics, high number of barriers, and low connectedness to others for potential support.

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Understanding these differences across risk and barrier profiles is an important step towards developing tailored approaches to increase mental health care in college populations.

Introduction

Suicide is a leading cause of preventable death worldwide among individuals between 15 and 29 years of age (World Health Organization, 2021) and the second leading cause of death among college students (Suicide Prevention Resource Center, 2014; Wolitzky-Taylor et al., 2020). Mental health challenges are highly prevalent on college campuses where suicide is also a rapidly rising public health concern (Cramer et al., 2020; Duffy et al., 2019; Kearns et al., 2015). A considerable proportion of college students experience lifetime and 12-month suicide thoughts and behaviors (Mortier et al., 2018), and despite severity of these issues, many do not seek or access mental health services (Ebert et al., 2019; Eisenberg et al., 2012). This suggests a critical need to better understand barriers to care among this population to inform urgently needed outreach and prevention efforts.

College counseling centers have reported substantial increases in the numbers of students with mental health challenges since 2007 (Duffy et al., 2019), with disparities in the number and types of challenges students face by various identities, sociodemographic factors, and life experiences (e.g., Lesbian, Gay, Bisexual, Transgender, and Queer/Questioning (LGBTQ+), Black, Indigenous, and People of Color (BIPOC) and other racial minority, trauma, and adverse childhood events; He et al., 2021; Wolford-Clevenger et al., 2020). Historically, stigma has been a notable impediment to help-seeking behaviors among college student populations (Cramer et al., 2020; Kearns et al., 2015), and research indicates that other people influence and impact an individual's decision to seek help (Wahlin & Deane, 2012). In addition to stigma, studies identify other key barriers to care such as the perception that treatment is not needed, uncertainty as to where to get professional help, lack of time, preference for self-management, denying or doubting the existence of a potential mental health problem, and believing that stress and other distressing symptoms are expected or normal without need for intervention (Arria et al., 2011; Czyz et al., 2013; Ebert et al., 2019).

Suicide risk factors are multifaceted, with clinical characteristics shown to vary across individuals (Ginley & Bagge, 2017), including alcohol use and misuse, impulsivity, depression, social disconnection and isolation, suicide ideation, and history of attempt. With converging evidence that alcohol use associates with both depression and suicide (Lamis & Bagge, 2011; Capron et al., 2018), alcohol is particularly relevant to college students due to their elevated risk for harmful consumption, binge drinking, and high rates of alcohol use disorders (Capron & Schmidt, 2012). Impulsivity also associates with greater alcohol use and depression, as well as suicide ideation and behavior among college students (Gonzalez et al., 2011). Additionally, social disconnection is an important contributor to heightened suicide risk (Arria et al., 2009; Calati et al., 2019), with evidence that low social support and loneliness relate to higher risk for suicide (Arria et al., 2009). Finally, suicide ideation and history of suicide attempt are both well-established risk factors and notable predictors of future suicide behavior and death (Abdu et al., 2020).

These clinical characteristics have been examined at length in research among college students, yet less is known about clinical profiles of risk and how these relate to professional help-seeking behavior. Importantly, there remains a gap in our understanding of how unique combinations of suicide risk factors (i.e., profiles of risk) relate with different types of help-seeking barriers. Greater knowledge of suicide risk profiles and their associated help-seeking barriers could inform tailored strategies for linking individuals to services and better approaches to engaging individuals in evaluation and treatment. This study aimed to address the following: 1) identifying distinct clinical profiles of college students who screened positive for suicide risk based on latent groupings of various well-documented clinical characteristics (suicide ideation, history of attempt, depression, alcohol misuse, impulsivity, and social disconnection); and 2) examining differences in help-seeking barriers by these profile groupings.

Method

This study is based on data originally obtained from individuals who participated in an online treatment linkage intervention study, Electronic Bridge to Mental Health (eBridge) for university students at heightened risk for suicide (King et al., 2022). Recruitment occurred between 2015 and 2018 across four university campuses in Western and Midwestern regions of the US. The study was approved by all involved Institutional Review Boards and participants were invited via emails obtained from university registrar offices. Given the treatment linkage intervention study aim of eBridge, the data used in the current secondary study included students who were at heightened risk for suicide and not engaging in or receiving mental health services. Study inclusion criteria include the following: over 18 years of age; resides in university community (e.g., not studying abroad); not currently receiving mental health service use; and a positive suicide risk screen. Current mental health service use was assessed in the screening process with students being ineligible for the eBridge study if they endorsed either of the following: 1) current use of prescription medication from a health professional for mental or emotional health, or 2) current counseling or therapy from a health professional for mental or emotional health. A positive suicide risk screen was defined by the presence of at least two of the following suicide risk factors: 1) recent suicide ideation, 2) lifetime history of suicide attempt, 3) current depression, and 4) current alcohol misuse (measurement described below). The analytic sample was comprised of the subset of 1,689 eligible students who also completed measures of impulsivity and social disconnection at baseline assessment.

Measurement

The self-report survey included measurement of sociodemographic and clinical characteristics, all at baseline assessment (King et al., 2022). The following sociodemographic variables from the eBridge survey are of focus in the current secondary study: age group (18 years, 19–22 years, 23–30 years, and 31+ years), race (White, Black, Asian, and other race), ethnicity (Hispanic/Latinx, non-Hispanic/Latinx), gender (male, female, and transgender or genderqueer), and sexual orientation (heterosexual, mostly heterosexual, gay or lesbian, bisexual or pansexual, and other sexuality).

Suicide ideation.—Suicide ideation was assessed using binary (yes/no) items of the National Comorbidity Survey (Kessler et al., 2004). A positive screen for having recent suicide ideation, as one of the 4 overall inclusion criteria risk areas, was determined with an affirmative response to either question: "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?" In addition, endorsement of the ninth item of the Patient Health Questionnaire 9-item (PHQ-9; Spitzer et al., 1999) was also considered a positive screen for suicide ideation (i.e., thoughts of being better off dead or hurting self in the past two weeks).

Lifetime suicide attempt.—History of suicide attempt was assessed using a single binary (yes/no) item from the National Comorbidity Study (Kessler et al., 2004). This item asked, "In your lifetime, have you ever attempted suicide?" Participants were categorized as having a positive screen for having a lifetime suicide attempt as one of the 4 overall inclusion criteria risk areas if they responded yes.

Depression.—The Patient Health Questionnaire 9-item (PHQ-9) (Spitzer et al., 1999) was used to measure depressive symptoms in the past two weeks using criteria of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychological Association, 1994). Response categories range from 0 (not at all) to 3 (nearly every day), with total scores ranging from 0 to 27. The PHQ-9 has been consistently used for screening and strongly correlates with clinically assessed depression diagnosis (Kroenke et al., 2001) and other depression screening and assessment tools (Spitzer et al., 1999). A positive screen of depression as one of the 4 overall inclusion criteria risk areas required a score of at least 3 on the first 2 items of the PHQ-9 (also known as the PHQ-2), a well-established cutoff score for depression screening (Kroenke et al., 2003). The PHQ-9 full scale was used in analyses of the current study and demonstrated internal consistency in this sample ($\alpha = .83$).

Alcohol misuse.—The Alcohol Use Disorders Identification Test (AUDIT; Saunders et al., 1993) was used to assess for alcohol misuse. The AUDIT scale includes 10 items that measure the frequency, volume/quantity, and consequences of drinking alcohol. Items were rated on a 5-point Likert scale with higher ratings indicating greater alcohol use or potential misuse. The total AUDIT scale scores range from 0 to 40, and a positive screen cutoff of 8 was used to detect high-risk alcohol use among college students as one of the 4 overall inclusion criteria risk areas (Czyz et al., 2013; Horwitz et al., 2020). The AUDIT demonstrated internal consistency in this sample ($\alpha = .85$).

Impulsivity.—Four items from the Urgency Premeditated Perseverance Sensation Seeking scale (UPPS; Lynam et al., 2006) were used to measure impulsiveness. Items pertain to making regretful statements after rejection, finding it difficult to not act on feelings/emotions, making matters worse by acting without thinking when upset, and regretting impulsive actions. Response categories range from 0 (strongly disagree) to 3 (strongly agree), with total scores ranging from 0 to 12 and greater scores indicating greater impulsivity. The 4-item UPPS scale demonstrated internal consistency ($\alpha = .82$).

Social disconnection.—Three items of the UCLA Loneliness scale (Russell et al., 1978) were used to measure social disconnection and feelings of loneliness and social isolation. Items assess a lack of companionship, feeling left out, and feeling isolated from others, with response ratings ranging from 0 (I hardly ever feel this way) to 2 (I often feel this way). Total scores range from 0 to 6, with higher scores indicating greater social disconnection. The 3-item UCLA scale demonstrated internal consistency (α =.80).

Help-seeking barriers.—Participants were asked the following question about barriers to seeking services and/or engaging in services: "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?" This question was followed by a list of 24 barrier types used in prior studies of college students (Downs & Eisenberg, 2012) in which various attitudes, beliefs, and experiences represent help-seeking barriers that lead to no service use. Consistent with prior research on help-seeking barriers among college students (Czyz et al., 2013; Horwitz et al., 2020; Busby et al., 2020), barrier types were categorized into the following: time (lack of time), fear of stigma (worries about loss of privacy and stigma), financial concerns (limited or lack of financial resources), questioning (doubts about usefulness of therapy and need for help), logistics (practical issues related to treatment access), and cultural sensitivity/understanding (sensitivity to issues affecting gender, sexual, or racial/ethnic identities). Barrier scores range from 0 to 24, with higher scores indicting greater barriers experienced.

Analytic Plan

Analyses were performed in SPSS28 and R with depmixs4 (Visser & Speekenbrink, 2010) for the Latent Class Analysis (LCA). Univariate distributions, bivariate correlations, and missing data were examined among all variables as a first step. As part of Aim 1, LCA was carried out using data with complete cases among the variables that were used to identify the latent classes. A total of six variables were selected for use in the LCA based upon converging evidence for their importance in prior research: suicide ideation, lifetime suicide attempt, depression, alcohol misuse, impulsivity, and social disconnection (Lamis & Bagge, 2011; Calati et al., 2019; Abdu et al., 2020; Capron & Schmidt, 2012). Classes were determined by the model with the lowest Bayesian Information Criterion (BIC) and Akaike Information Criterion (AIC). Log likelihood ratio tests were also used to check for significantly better fitting models.

After LCA groups were established, differences between classes in student demographic characteristics, clinical characteristics, and barriers to professional help-seeking were examined using Chi-square tests for categorical variables and one-way ANOVAs for continuous variables. Post-hoc testing for chi-square analyses was performed by examining the unique contribution (i.e., standardized residual) of each cell (Beasley & Schumacker, 1995), with standardized residuals of 2.58 (p-value of < 0.01) or greater reported as statistically significant to control for Type I error. Tukey post-hoc testing was used for one-way ANOVAs. Next, a series of logistic regressions were performed to compute adjusted odds ratios for each of the seven barriers categories and its association with LCA group membership. Models were evaluated for good fit per the non-significant Hosmer-Lemeshow

goodness of fit test, and controlled for age, race, and sexual orientation given the aims of the study and prior literature (Czyz et al., 2013; Horwitz et al., 2020). Lastly, post-hoc testing using the Holm-Bonferroni method was performed due to multiple contrasts of the three LCA groups that were entered into logistic regressions as dummy variables with a reference group excluded in rotation. There was no difference in findings before and after post-hoc adjustments.

Results

Characteristics of the sample (n=1,689) are presented in Table 1. The majority of participants had a positive screen for depression (77.1%, n=1303) and suicide ideation (89.4%, n=1510), with fewer screening positive for alcohol misuse (35.7%, n=602) and lifetime suicide attempt (26.3%, n=444). Most of the sample (n=1275, 75.5%) had positive screens for two elevated suicide risk domains (i.e., inclusion criteria), and 24.5% (n=414) had positive screens for three or more risk domains. The average number of barriers endorsed among participants was 7.53 (Standard Deviation [SD] = 0.10) and the most frequently endorsed barriers were time (n=1134, 67.1%) and fear of stigma (n=1125, 66.6%).

A series of four models were estimated for the LCA specifying two through five classes with six suicide risk variables (suicide ideation, lifetime suicide attempt, depression, alcohol misuse, impulsivity, and social disconnection). The three-class model had the lowest BIC and AIC values, with significantly better fit than the two-class and four-class models. The five-class model did not converge. The final model with the best fit resulted in three groups with G1 having 527 participants (31%), G2 having 345 (20%), and G3 having 805 (48%). LCA groups are discussed below and displayed in Figure 1.

Demographic differences by LCA group

Significant differences in age group ($\chi 2(6) = 42.50$, p <.001), race ($\chi 2(6) = 64.73$, p <.001), and sexual orientation ($\chi 2(8) = 28.29$, p <.001) were found between LCA groups before and after post-hoc testing (Table 2). Participants in G1 were younger than those in G2 and G3, with more 18-year-old students in G1 (52.8%) and more students ≧19 in G2 and G3 (60.3% and 63.5%, respectively). More students identified as White (73.5%) in G3, whereas G1 was characterized by more racially diverse students (African American/Black, Asian, or other non-White race: 48.2%) relative to both G2 and G3. There was a higher proportion of heterosexual students in G3 (61.3%) compared to other groups, whereas G1 was the most sexually diverse (gay or lesbian, bisexual or pansexual, other: 36.1%) in comparison to G2 and G3.

Differences in clinical characteristic by LCA group

There were significant differences in the presence of suicide ideation ($\chi 2(2) = 87.20$, p <.001), alcohol misuse scores ($F(2,1677) = 641.59$, p <.001), depression scores ($F(2,1677) = 193.53$, p <.001), impulsivity scores ($F(2,1677) = 28.44$, p <.001), and social disconnection scores ($F(2,1677) = 694.43$, p <.001) between LCA groups (Table 2). The greatest endorsement of suicide ideation was present in G2 (37.9%) while the highest alcohol misuse

scores were reported by those in G3 (M = 7.99, SD = 4.76). In contrast, students in G1 (M = .26, SD = .44) had the lowest alcohol misuse in comparison to other groups. Students in G2 had the highest depression scores (M = 15.87, SD = 5.09) and G3 had the lowest (M = 10.17, SD = 4.90). G2 students had the highest impulsivity (M = 6.86, SD = 3.07) and social disconnection (M = 5.80, SD = .40) scores than the other groups, while students in G3 had the lowest impulsivity (M = 5.35, SD = 3.13) and social disconnection (M = 2.71, SD = 1.42) scores.

Differences in Help-Seeking Barriers by LCA group

Also shown in Table 2, there was a significant difference in the total number of barriers endorsed between LCA groups (F(2,1674) = 32.40, p <.001) before and after post-hoc testing. Students in G2 reported the most barriers (M = 8.61, SD = 3.96) and G3 the lowest (M = 6.78, SD = 3.74). As for barrier types, there was a significant difference across LCA groups by the six barrier types: time (χ2(2) = 8.12, p <.05), fear of stigma (χ2(2) = 42.32, p <.001), financial (χ2(2) = 14.29, p <.01), questioning (χ2(2) = 20.50, p <.001), logistics (χ2(2) = 23.28, p <.001), and cultural sensitivity (χ2(2) = 64.11, p <.001).

Logistic regression findings with adjusted odds ratios (AOR) and post-hoc testing are presented in Table 3. Students in G2 had the highest endorsement of the following barriers in comparison to the other groups: time (73.6%), questioning effectiveness of treatment (57.1%), logistics (55.9%), and cultural sensitivity (43.8%). Relative to both G1 and G3, G2 students had significantly higher odds of reporting time (AOR range = 1.44–1.49), questioning (AOR range = 1.51–1.80), logistics (AOR range = 1.53–1.88), and cultural sensitivity (1.51–1.88) as a barrier. Overall, G3 students had the lowest endorsement of questioning (46.6%), logistics (40.5%), and cultural sensitivity (21.9%) than all other groups.

Students reporting a fear of stigma as a barrier was greater in both G1 (72.5%) and G2 (75.6%) than in G3 (58.9%), with G2 being slightly greater. The odds for reporting fear of stigma as a barrier was significantly greater for both G1 and G2 students in comparison with G3 (AOR range = 1.64–2.14). Similarly, endorsement of financial concerns was greater in both G1 (54.7%) and G2 (57.1%) than G3 (46.6%), with G2 being slightly greater. The odds for reporting financial concerns as a barrier were significantly greater for both G1 and G2 students in comparison with G3 (AOR range = 1.37–1.50).

Discussion

This study examined barriers to professional help-seeking, based on differing clinical profiles of suicide risk, in a large, multi-campus sample of college students. Given various risk factors are at play in suicidal thoughts and behavior, an improved understanding of college student suicide risk profiles and how these relate to barriers to help-seeking is an important step towards tailoring approaches to engage at-risk college students in mental health care.

LCA modeling resulted in three distinct groups (G1, G2, G3) with various demographic and clinical characteristics. Demographically, G1 included the youngest students and was the

most racially and sexually diverse of all three groups. Specifically, 48.2% in G1 identified as African American/Black, Asian, or other non-White race, and 36.1% identified as gay or lesbian, bisexual or pansexual, or another sexual orientation. Participants in G2 were most similar to G1 demographically, while G3 included the greatest number of White (73.5%) and heterosexual students (61.3%).

Clinically, G1 participants had the lowest alcohol misuse scores overall, and relative to G2 and G3, had moderate levels of depression, impulsivity, and social disconnection. A higher proportion of participants in G2 endorsed suicide ideation (37.9%) relative to G1 and G3, and had the highest depression, impulsivity, and social disconnection scores in comparison to the other two groups. In contrast, those in G3 had the highest alcohol misuse and lowest depression, impulsivity, and social disconnection scores in comparison to G1 and G2. Taken together, G1 could be described as having *moderate internalizing and externalizing symptoms* (with the lowest alcohol misuse), G2 having the *highest internalizing and externalizing symptoms* (highest suicide ideation, depression, impulsivity, and social disconnection), and G3 the *lowest internalizing symptoms* (and highest alcohol misuse).

Barriers to seeking mental health services were common among all participants, with time and fear of stigma being most frequent overall (67.1% and 66.6%, respectively). Also common were barriers related to financial concerns and questioning the need for or usefulness of services, with each being reported by over half of study participants. Importantly, and pertaining to our second study aim, there were notable differences among the three LCA groups with respect to barrier endorsement. Participants in G2 endorsed the greatest number of barriers overall, and participants in G3 endorsed the fewest. Those in G2 differed from G1 and G3 with significantly increased likelihood of endorsing barriers of time, questioning need and effectiveness, logistics, and cultural sensitivity. Furthermore, G2 participants most often endorsed fear of stigma and financial concerns as a barrier to help-seeking in comparison to other groups.

The barrier patterns described above are especially concerning given G2 had the most severe clinical characteristics in terms of highest internalizing and externalizing symptoms as well as high social disconnection. Consistently, prior research has showed that those with more severe suicide ideation or other related risk factors tend to report lowest help-seeking intentions (Czyz et al., 2013; Yakunina et al., 2010). The present study further demonstrates that, among an already elevated-risk student population, there is a subset of young people with an especially severe clinical profile who, in addition to appearing most reluctant to seek mental health services and most socially disconnected, may also be least likely to receive support from non-professional or peer sources.

In contrast with G2, the largest latent group characterized by the least severe internalizing symptoms as well as high social connectedness and alcohol misuse (G3), endorsed the fewest barriers to help-seeking. After adjusting for covariates, and in comparison to G2, students in G3 had the lowest likelihood of endorsing the specific barriers related to stigma, financial concerns, questioning, logistics, and cultural sensitivity. Furthermore, students in G3 also had the lowest likelihood of endorsing barriers related to stigma and financial

concerns in comparison to G2. Although not significantly greater in comparison with other latent groups, the most frequently endorsed barrier among G3 students was time. In contrast, the most frequently endorsed barrier among G1 and G2 students was stigma. Thus, fear of stigma appears to be most prominently endorsed by students with moderate-to-severe internalizing and externalizing symptoms who are relatively more socially disconnected and identify as more racially and sexually diverse.

Overall, results suggest that reducing barriers to help-seeking among students at elevated suicide risk may require multifaceted and personalized approaches, as distinct help-seeking barriers had different salience for specific suicide risk subgroups in the current study. For example, improving treatment linkage for the highest-risk profile (students with severe internalizing and internalizing symptoms and greater social disconnection) will likely involve expanding access to care that eases practical concerns (e.g., logistics) as well as implementing broader initiatives that address fear of stigma, cultural sensitivity concerns, financial concerns, and treatment misconceptions. This is especially important given the student group showing the highest levels of clinical symptoms (G2) were significantly more likely to endorse "lack of need" for treatment as a barrier to professional help-seeking. As a result, college students with high internalizing and externalizing symptoms (similar to the G2 group) may benefit from professional engagement and treatment approaches that reduce suicide risk and are focused on targeting more severe clinical symptoms (e.g., endorsement of suicide ideation, impulsivity, depression), bolstering social connections on college campuses, and addressing various perceptual concerns about stigma and the need for treatment. Prevention approaches as recommended by The Jed Foundation (JED) include campus-wide initiatives to support mental health of students, recognize students who are facing challenges, reach out to students facing challenges, and connect students to professional care when needed. Recommendations point towards the importance of universally screening students periodically and providing psychoeducation to all students about mental health, suicide risk, treatment options with a goal of normalizing and destigmatizing professional help-seeking (MacPhee et al., 2021).

Reaching students with lower internalizing symptoms and high alcohol misuse (similar to the largest group of students in the current study; G3) may involve targeted interventions that leverage social or peer networks to facilitate care access. Such targeted approaches to both professional mental health engagement and treatment could involve screening for and providing services for alcohol misuse as it relates to suicide risk in addition to depression (Lamis et al., 2014). Also in line with recommendations by JED, peer support groups and gatekeeper training can increase the likelihood that students can be identified as potentially being at risk, to reduce stigma, and build help-seeking motivation through engagement with college professionals and peers (MacPhee et al., 2021; Substance Abuse and Mental Health Services Administration, 2021).

Approaches for younger, more racially diverse (BIPOC), and sexually diverse (LGBTQ+) students with low alcohol misuse and moderate internalizing and externalizing symptoms (similar to G1) may emphasize focus on reducing stigma and cultural sensitivity concerns. The focus on individual and perceptual experiences of sociodemographic identities and culture yields similar recommendations as the G2 group above (i.e., campus-wide screening

and psychoeducation campaigns to decrease stigma and empower students to seek professional help) (MacPhee et al., 2021; Substance Abuse and Mental Health Services Administration, 2021).

Though some barriers were specific to distinct subgroups, there were also frequently endorsed and cross-cutting barriers, such as lack of time. Thus, engaging all subgroups may also be facilitated by offering a range of flexibility in the delivery of services to meet the needs of students with various time constraints (i.e., self-paced, web-based, telehealth, hybrid options). The flexible delivery of services also can address logistic barriers that arose for students in the current study. Given suicide risk factors are multifaceted and literature support a multi-level approach to prevention (i.e., population, institutional, and individual levels) (van der Feltz-Cornelis et al., 2011), college campus should consider implementing programs like Signs of Suicide (SOS) that aim to identify and address risk using multiple prevention approaches. SOS integrates public campaigns, psychoeducation, screening, gatekeeper training, and crisis intervention services, most ideally involving multidisciplinary teams in implementation (MacPhee et al., 2021). Future research is necessary to examine the types of tailored outreach and intervention approaches that might be preferred and most effective in addressing the unique treatment-seeking barriers and unmet mental health treatment needs of these student subgroups.

Several limitations are important to note. First, though the sample is uniquely comprised of students at elevated risk for suicide, it may not reflect all college students since it contains interested students who responded to an email invitation and subsequently were determined to be eligible based upon study inclusion criteria. These criteria included the requirement that students were not receiving mental health services; therefore, a related limitation is that data were not collected from students at elevated risk for suicide who endorsed engaging with or receiving mental health services at the time of study. Furthermore, no comparisons can be made in these data with college students receiving various degrees of services, including those with low adherence to services. Second, the sample may not represent all college students given the majority in the current study identified as White (65.7%), non-Hispanic/Latinx (87.2%), female (62.9%), and heterosexual (57.5%). Third, it is possible that participants under-reported suicide risk factors and barriers to help-seeking, possibly related to social desirability. Lastly, the study was cross-sectional; therefore, we were unable to examine longitudinal relationships between latent suicide risk profiles, clinical characteristics, and barrier fluctuations across time.

In sum, findings highlight differences in suicide risk profiles and help-seeking barrier experiences among college students at elevated suicide risk. Among this already high-risk sample of college students, there was a subgroup of students with particularly high internalizing and externalizing symptoms as well as high endorsement of social disconnection in comparison to the other groups who, in addition to appearing most reluctant to seek services, may also be the least likely to receive non-professional and peer support. Understanding differences in help-seeking barriers is important to inform tailored approaches to engaging college populations in mental health care. Future research is needed to examine differing approaches to outreach and intervention with tailoring for various

risk profiles to address help-seeking barriers and unmet mental health treatment needs of students.

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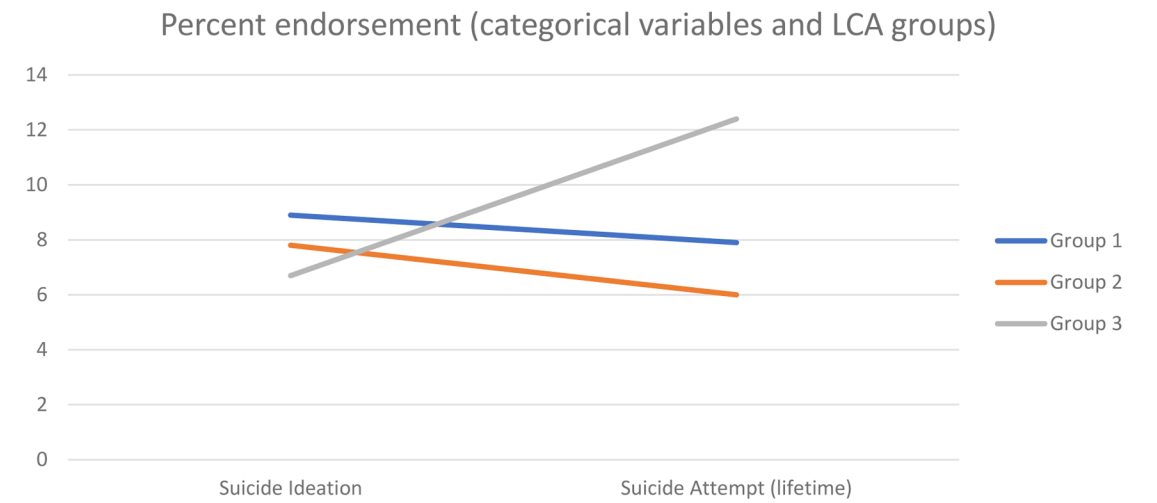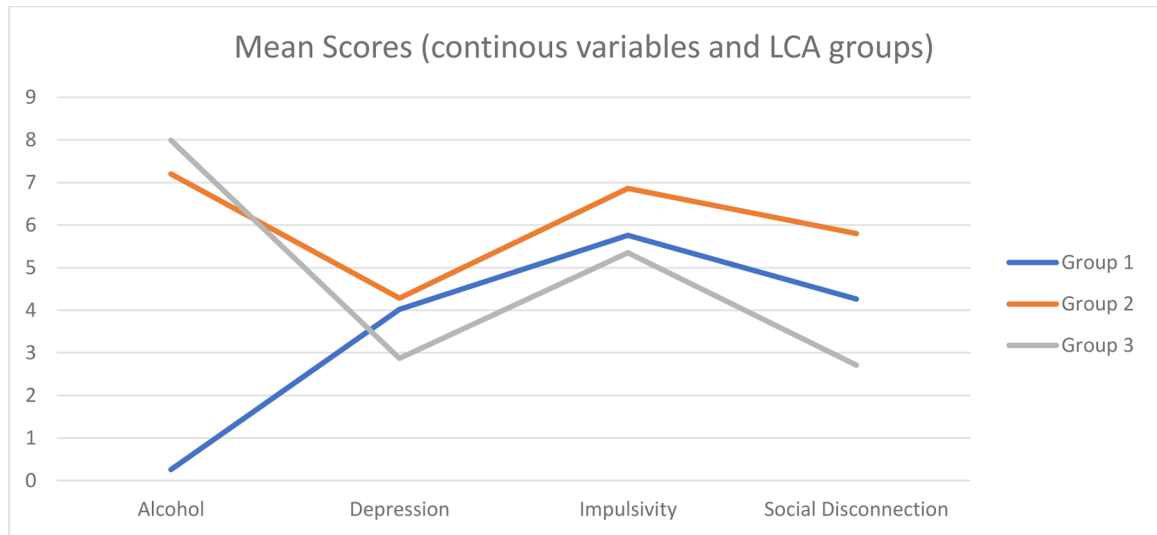
Figure 1.
Characteristics of LCA groups

Table 1.

Sample characteristics (n=1,689)

Characteristic	n	%
Age Group		
18 years	713	42.4
19–22 years	622	37.0
23–30 years	292	17.4
31+ years	55	3.3
Race		
White	972	65.7
Black	119	8.0
Asian	332	22.4
Other race	56	3.8
Gender		
Female	1058	62.9
Male	578	34.4
Transgender or Genderqueer	45	2.7
Ethnicity		
Hispanic or Latinx	216	12.8
Non-Hispanic or Latinx	1473	87.2
Sexual Orientation		
Heterosexual	960	57.5
Mostly heterosexual	215	12.9
Gay or Lesbian	104	6.2
Bisexual or Pansexual	294	17.6
Other sexuality	98	5.9
AUDIT positive screen		
Yes	603	35.7
No	1086	64.3
PHQ positive screen		
Yes	1303	77.1
No	386	22.9
SI positive screen		
Yes	1510	89.4
No	179	10.6
SA positive screen		
Yes	444	26.3
No	1245	73.7
Barrier types endorsed		
Time		
Present	1134	67.1
Not present	555	32.9

Characteristic	n	%
Fear of stigma		
Present	1125	66.6
Not present	564	33.4
Financial concerns		
Present	865	51.2
Not present	824	48.8
Questioning		
Present	922	54.6
Not present	767	45.4
Logistics		
Present	760	45.0
Not present	929	55.0
Cultural sensitivity/understanding		
Present	523	31.0
Not present	1166	69.0

Table 2.

Demographic, clinical, and barrier characteristics by LCA group

Characteristic	[a]Group 1 (n= 527)		[b]Group 2 (n=345)		[c]Group 3 (n=805)		Significance
	n	%	n	%	n	%	
Age Group							***
18 years	280	52.8%	137	39.7%	294	36.5%	$c<b<a$
19–22 years	171	32.3%	127	36.8%	324	40.2%	$a<b<c$
23–30 years	69	13.0%	72	20.9%	151	18.8%	$a<c<b$
31+ years	10	1.9%	9	2.6%	36	4.5%	$a<b<c$
Race							***
White	238	51.9%	205	68.1%	528	73.5%	$a<b<c$
African-American/Black	45	9.8%	28	9.3%	46	6.4%	$c<b<a$
Asian	155	33.8%	56	18.6%	121	16.9%	$c<b<a$
Other	21	4.6%	12	4.0%	23	3.2%	$c<b<a$
Gender							
Female	352	66.5%	218	63.2%	486	60.4%	
Male	159	30.1%	119	34.5%	300	37.3%	
Transgender or genderqueer	18	3.4%	8	2.3%	19	2.4%	
Ethnicity							
Hispanic/Latinx	77	14.5%	47	13.6%	91	11.3%	
Non-Hispanic/Latinx	453	85.5%	298	86.4%	714	88.7%	
Sexual Orientation							***
Heterosexual	279	53.2%	188	54.7%	491	61.3%	$a<b<c$
Mostly heterosexual	56	10.7%	49	14.2%	110	13.7%	$a<c<b$
Gay or Lesbian	33	6.3%	23	6.7%	48	6.0%	$c<a<b$
Bisexual or Pansexual	108	20.6%	65	18.9%	121	15.1%	$c<b<a$
Other	48	9.2%	19	5.5%	31	3.9%	$c<b<a$
Suicide ideation endorsed							***
Yes	150	28.3%	131	37.9%	113	14.0%	$c<a<b$
No	380	71.7%	214	62.1%	692	86.0%	$b<a<c$
Suicide attempt endorsed (lifetime)							
Yes	133	25.1%	100	29.0%	209	26.0%	
No	397	74.9%	245	71.0%	596	74.0%	
Alcohol score (M±SD)	530	.26 ± .44	345	7.2 ± 4.97	805	7.99 ± 4.76	***$a<b<c$
Depression score (M±SD)	530	13.92 ± 4.82	345	15.87 ± 5.09	805	10.17 ± 4.90	***$c<a<b$
Impulsivity score (M±SD)	530	5.76 ± 3.10	345	6.86 ± 3.07	805	5.35 ± 3.13	***$c<a<b$
Social disconnection score (M±SD)	530	4.26 ± 1.54	345	5.80 ± .40	805	2.71 ± 1.42	***$c<a<b$
Number of barriers (M±SD)	527	7.98 ± 3.91	345	8.61 ± 3.96	805	6.78 ± 3.74	***$c<a<b$

Characteristic	[a]Group 1 (n= 527)		[b]Group 2 (n=345)		[c]Group 3 (n=805)		Significance
	n	%	n	%	n	%	
Barrier types							
Time							*
Endorsed	347	65.5%	254	73.6%	528	65.6%	$a_<c_<b$
Not endorsed	183	34.5%	91	26.4%	277	34.4%	$b_<c_<a$
Fear of stigma							***
Endorsed	384	72.5%	261	75.6%	474	58.9%	$c_<a_<b$
Not endorsed	146	27.5%	84	24.4%	331	41.1%	$b_<a_<c$
Financial concerns							**
Endorsed	290	54.7%	197	57.1%	375	46.6%	$c_<a_<b$
Not endorsed	240	45.3%	148	42.9%	430	53.4%	$b_<a_<c$
Questioning							***
Endorsed	288	54.3%	224	64.9%	406	50.4%	$c_<a_<b$
Not endorsed	242	45.7%	121	35.1%	399	49.6%	$b_<a_<c$
Logistic							***
Endorsed	238	44.9%	193	55.9%	326	40.5%	$c_<a_<b$
Not endorsed	292	55.1%	152	44.1%	479	59.5%	$b_<a_<c$
Cultural sensitivity/understanding barriers							***
Endorsed	193	36.4%	151	43.8%	177	21.9%	$c_<a_<b$
Not endorsed	337	63.6%	194	56.2%	628	78.0%	$b_<a_<c$

Notes: Oneway ANOVA (with Tukey post-hoc) significance tests were used for continuous characteristics and Chi-square significance tests were used for categorical or dichotomous characteristics with standardized residual post-hoc evaluations to interpret chi-square results. Post-hoc statistical significance illustrated using "<" or ">" in relation to groups

[a]Group 1;

[b]Group 2;

[c]Group 3

*
p<.05,

**
p<.01,

***
p<.001

Table 3.

Logistic regressions examining barrier likelihood by LCA groups

	Barrier Type											
	[a]Time		[b]Fear of stigma		[c]Financial		[d]Questioning		[e]Logistics		[f]Cultural Sensitivity	
Model Variables	Wald X^2	AOR (95% CI)	Wald X^2	AOR (95% CI)	Wald X^2	AOR (95% CI)	Wald X^2	AOR (95% CI)	Wald X^2	AOR (95% CI)	Wald X^2	AOR (95% CI)
LCA group 1 vs 3 (ref=3)	.09	1.04 (.82–1.32)	15.65	1.64 (1.28–2.09)***	7.12	1.37 (1.09–1.73)**	2.35	1.19 (.95–1.50)	2.99	1.22 (.97–1.54)	2.99	1.22 (.97–1.54)
LCA group 2 vs 3 (ref=3)	7.76	1.49 (1.13–1.98)**	26.96	2.14 (1.60–2.84)***	9.38	1.50 (1.16–1.95)**	19.23	1.80 (1.38–2.34)***	22.84	1.88 (1.45–2.43)***	22.84	1.88 (1.45–2.43)***
LCA group 2 vs 1 (ref=1)	5.54	1.44 (1.06–1.95)*	2.68	1.30 (.95–1.79)	.40	1.09 (.83–1.45)	7.99	1.51 (1.13–2.00)**	8.99	1.53 (1.16–2.02)**	8.06	1.51 (1.14–2.00)***
Age	2.49	1.11 (.98–1.25)	24.36	.73 (.65–.83)***	27.58	1.38 (1.23–1.56)***	.29	1.03 (.92–1.16)	13.45	1.25 (1.11–1.41)***	2.54	.89 (.79–1.03)
Race	3.85	.92 (.85–1.00)	.01	.99 (.92–1.08)	3.59	1.08 (.99–1.17)	6.56	.90 (.83–.98)**	.05	.99 (.92–1.07)	14.99	1.181 (1.09–1.28)***
Sexual Orientation	.38	1.02 (.95–1.10)	3.91	1.08 (1.00–1.17)*	38.21	1.26 (1.17–1.36)***	8.41	1.13 (1.04–1.20)**	11.51	1.13 (1.05–1.22)**	1.95	1.06 (.98–1.14)

Notes: Ref, Reference group; AOR, Adjusted Odds Ratio; CI, Confidence Interval; Logistic regression models controlled/adjusted for age, race, and sexual orientation. Holm-Bonferroni post-hoc tests were used due to multiple contrasts of the three LCA groups with no difference in findings. All models demonstrated good fit per non-significant Hosmer and Lemeshow Tests

[a]$X^2(8) = 3.05$, p>.05, Nagelkerke $R^2 = .013$;

[b]$X^2(7) = 17.46$, p>.05, Nagelkerke $R^2 = .058$;

[c]$X^2(7) = 2.11$, p>.05, Nagelkerke $R^2 = .066$;

[d]$X^2(8) = 11.76$, p>.05, Nagelkerke $R^2 = .027$;

[e]$X^2(8) = 9.60$, p>.05, Nagelkerke $R^2 = .038$;

[f]$X^2(7) = 6.25$, p>.05, Nagelkerke $R^2 = .067$.

*
p<.05,

**
p<.01,

***
p<.001